STANFORD UNIVERSITY
2018 GENERAL USE PERMIT

Final Environmental Impact Report
State Clearinghouse No. 2017012022

Part 1

Prepared for
Santa Clara County
Department of Planning & Development
Planning Office

December 2018



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SCO Responses to Notice of Preparation SCO-1
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NOI Noise Appendix NOI-1
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AQT-REV Stanford 2018 General Use Permit Application: Air Quality Technical Report (Revised) AQT-REV-1
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LIST OF ABBREVIATIONS AND ACRONYMS

ABAG	Association of Bay Area Governments
AB 26	California Assembly Bill 26
AB 32	California Global Warming Solutions Act
AB 52	California Assembly Bill 52
AB 939	California Integrated Waste Management Act of 1989
AB 900	California Assembly Bill 900
AB 1358	California Assembly Bill 1358
AB 1484	California Assembly Bill 1484
AB 1807	California Assembly Bill 1807
AB 1881	California Assembly Bill 1881
AB 2588	California Assembly Bill 2588
ACHP	federal Advisory Council on Historic Preservation
ACI	American Concrete Institute
ACM	asbestos-containing materials
AC Transit	Alameda-Contra Costa Transit District
ADA	federal Americans with Disabilities Act of 1990
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AFY	acre-feet per year
AGB	Academic Growth Boundary
agl	above ground level
ALUC	Santa Clara County Airport Land Use Commission
APRS	Administrative Panel on Radiation Safety
APSA	California Aboveground Petroleum Storage Act
AR4	Fourth Assessment Report
ASA	County Architecture and Site Approval process
ASCE	American Society of Civil Engineers
asl	above sea level

ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BART	San Francisco Bay Area Rapid Transit District
Basin Plan	San Francisco Bay Basin (Basin Plan)
BAWSCA	Bay Area Water Supply and Conservation Agency
BDT	best demonstrated technology
BRH	Bureau of Radiological Health
BMPs	best management practices
Btu	British thermal units
CAA	federal Clean Air Act
CAGR	Compound Annual Growth Rate
CalARP	California Accidental Release Prevention Program
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
Cal OES	Governor's Office of Emergency Services
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation
CBC	California Building Code
CCAT	California Climate Action Team
CCFD	Santa Clara County Central Fire Department
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDPH-RHB	California Department of Public Health, Radiological Health Branch
CDP	Census-Designated Place for federal census
CDSM	Cement Deep Soil Mixing foundation technique
CEC	California Energy Commission
CEF	Stanford Central Energy Facility
CERCLA	federal Comprehensive Environmental Response, Compensation and Liability Act of 1980
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey

CFR	Code of Federal Regulations
CHP	California Highway Patrol
CH_4	methane
CHRS	California Historical Resources System
CLUP	Comprehensive Land Use Plan by Santa Clara County Airport Land Use Commission
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database inventory of rare plants and animals
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2E	carbon dioxide equivalent
Corps	U.S. Army Corps of Engineers
CPAU	City of Palo Alto Utilities Department
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CSC	California Species of Concern
CTS	California tiger salamander
CTC	California Transportation Commission
CUPAs	certified unified program agencies for hazardous materials programs
CWA	Federal Clean Water Act
cy	cubic yards
DAPER	Stanford Department of Athletics, Physical Education, and Recreation
dB	decibel
DEH	County Department of Environmental Health
DNL	day-night noise level
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPS	Stanford Department of Public Safety

DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EIF	Environmental Information Form
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act of 2007
ECIP	Energy Conservation Incentive Program
EH&S	Stanford Department of Environmental Health and Safety
ERP	Energy Retrofit Program
EMS	emergency medical service
EO	Executive Order issued by California Governor or U.S. President
EOC	Emergency Operations Center
EPCRA	Emergency Planning Community Right-to-Know Act
ESF	Environmental Safety Facility
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FCAA	federal Clean Air Act
FAR	floor area ratio
FCVs	Fuel cell vehicles
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FFVs	flexible fuel vehicles
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FTE	full-time equivalent workers
GGE	greenhouse gas equivalents
GWh	gigawatt hours
GHGs	Greenhouse gases
gpm	gallons per minute
gsf	gross square feet
GVW	gross vehicle weight
GWP	global warming potential
GSP	groundwater sustainability plan

HAP	hazardous air pollutant
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons
HHC	County Historical Heritage Commission
HMTA	Hazardous Materials Transportation Act
HMBP	Hazardous Materials Business Plan
HM Project	Hydromodification Management Project
HRA	health risk assessment for hazardous or toxic air pollutants
HCM 2000	Highway Capacity Manual 2000
HEPA	High Efficiency Particulate Air Filter
HLUCP	Heliport Land Use Compatibility Plan
HI	hazard index for hazardous or toxic air pollutant exposure
HMBP	hazardous materials business plan
HRA	Health Risk Assessment
HOV	High Occupancy Vehicle
HMCD	County Hazardous Materials Compliance Division
HVAC	heating, ventilation and air conditioning
Hz	hertz
ISG	Individual Supply Guarantee for potable water deliveries
ISL	Interim Supply Limitation for potable water deliveries
I-280	Interstate 280
I-80	Interstate 80
IFC	International Fire Code
IPCC	Intergovernmental Panel on Climate Change
ITP	Incidental Take Permit
ITS	Intelligent Transportation Systems
kWh	kilowatt-hours
LAFCO	Santa Clara County Local Agency Formation Commission
L_{eq}	equivalent continuous sound level
L_{max}	maximum noise level
Lb	pounds
LEPC	Local Emergency Planning Committee
LBRE	Stanford Lands, Buildings and Real Estate Division
LCFS	Low Carbon Fuel Standard

LEED®	Leadership in Energy and Environmental Design
LID	Low Impact Development
LORS	Laws, Ordinances, Regulations, and Standards
LBP	lead-based paint
LVW	loaded vehicle weight
MACT	Maximum Achievable Control Technology
MBTA	Federal Migratory Bird Treaty Act
mgd	million gallons per day
MMBTUs	million British Thermal Units
MMcf	million cubic feet
MMRP	Mitigation Monitoring and Reporting Program required by CEQA
MPO	Metropolitan Planning Organization
MRZ	Mineral Resource Zone designated by the State Geologist
MS4	Municipal Separate Storm Sewer System
msl	mean sea level
MTC	Metropolitan Transportation Commission
$MTCO_2E$	metric tons of carbon dioxide equivalent
Mw	Maximum Moment Magnitude Earthquake
MW	megawatt
MWh	megawatt-hours
MWh/year	megawatt-hours per year
NAAQS	national ambient air quality standards
NAHC	California Native American Heritage Commission
NECPA	National Energy Conservation Policy Act
NEHRP	National Earthquake Hazards Reduction Program
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NIH	National Institutes of Health
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOP	CEQA Notice of Preparation

NOx	nitrogen oxide
N_2O	nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NPPA	California Native Plant Protection Act
NPDES	National Pollutant Discharge Elimination System
NRC	National Research Council of the National Academies of Sciences, Engineering, and Medicine
NTR	National Toxics Rule
NWIC	Northwest Information Center of the California Historical Resources Information System
OEHHA	California Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OPR	Governor's Office of Planning and Research
OSHA	Occupation Safety and Health Administration
PAFD	City of Palo Alto Fire Department
PAPD	City of Palo Alto Police Department
PAUSD	Palo Alto Unified School District
PCBs	polychlorinated biphenyls
PDA	Priority Development Area identified by ABAG
perc	percloroethylene
PG&E	Pacific Gas and Electric Company
PHEVs	plug-in hybrid electric vehicles
PM	particulate matter
$PM_{2.5}$	particulate matter of 2.5 microns in diameter or less
PM_{10}	particulate matter of 10 microns in diameter or less
ppb	parts per billion
pphm	parts per hundred million
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
PSSI	Peninsula Sanitary Service, Inc.
QOS	quality of service
RCRA	Resource Conservation and Recovery Act of 1976
RECP	Regional Emergency Coordination Plan
RFS	Renewable Fuel Standard

RHNA	Regional Housing Need Allocation developed by ABAG
RICE	Reciprocating Internal Combustion Engines
RLMP	Responsible Laboratory Management Practices
RMP	Risk Management Plan
ROG	reactive organic gases
RPS	Renewable Portfolio Standard established by the CEC
RRMP	Revised Risk Management Plan
RSPA	Research and Special Programs Administration
RTPs	Regional Transportation Plans mandated by state law
RWQCB	Regional Water Quality Control Board
RWQCP	Regional Wastewater Quality Control Plant
SAC	Stanford Seismic Advisory Committee
SARA	Superfund Act and Reauthorization Act of 1986
SB 32	California Senate Bill 32
SB 97	California Senate Bill 97
SB 107	California Senate Bill 107
SB 350	California Senate Bill 350
SB 352	California Senate Bill 352
SB 375	California Senate Bill 375
SB 610	California Senate Bill 610
SB 656	California Senate Bill 656
SB 743	California Senate Bill 743
SCS	Sustainable Communities Strategy required by SB 375
SAAQS	state ambient air quality standards
SCRA	Stanford Campus Residential Association
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SMCTA	San Mateo County Transportation Authority
SamTrans	San Mateo County Transit District
SCVWD	Santa Clara Valley Water District
SAR	Second Assessment Report
SCA	Special Conservation Areas identified in Stanford Community Plan
SCS	Sustainable Communities Strategy
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program

SCVTA	Santa Clara Valley Transportation Authority
SDC	Seismic Design Category
SDWA	Safe Drinking Water Act
sf	square feet
SESI	Stanford Energy System Innovations
SFBAAB	San Francisco Bay Area Air Basin
SFCJPA	San Francisquito Creek Joint Powers Authority
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act of 2014
SHPO	State Historic Preservation Officer
SEI	Structural Engineering Institute
SEL	Sound Exposure Level
SIM1	Lorry I. Lokey Stem Cell Research Building
SIP	State Implementation Plan for federal Clean Air Act compliance
SLAC	Stanford Linear Accelerator Center
SMOP	Synthetic minor operating permits
SO_2	sulfur dioxide
SR 82	State Route 82
SR 84	State Route 84
SR 85	State Route 85
STC	sound transmission class
STIP	State Transportation Improvement Program
SUFMO	Stanford University Fire Marshal's Office
SUMC	Stanford University Medical Center
STC	sound transmission class
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TAZs	Traffic Analysis Zones
TBACT	Best Available Control Technology for Toxics
TDM	Transportation Demand Management
TIRE	Traffic Infusion on Residential Environment
TMDL	total maximum daily load for water quality standards

TMP	Transportation Management Plan
TPY	tons per year
UCHS	Stanford University Committee on Health and Safety
UCERF3	Uniform California Earthquake Rupture Forecast
UCMP	University of California Museum of Paleontology
UPAAG	Unified Program Administration and Advisory Group for hazardous materials programs
U.S. 101	U.S. Highway 101
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UPAs	Unified Program Agencies for hazardous materials programs
USP	Stanford University Safety Partners
USTs	Underground storage tanks
UWMP	Urban Water Management Plan
$\mu g/m^3$	micrograms per cubic meter
VdBs	vibration decibels
VMS	Variable Message Signs
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WBERP	Whole Building Retrofit Program
WGCEP	Working Group on California Earthquake Probabilities
WHO	World Health Organization
WSA	Water Supply Assessment
Y2E2	Stanford Yang & Yamazaki Environment & Energy Building
ZNE	zero net energy

CHAPTER 1
Summary

1.1 Introduction

This Environmental Impact Report is an informational document intended to disclose to the public and decision-makers the environmental consequences of the proposed Stanford University 2018 General Use Permit, as applied for by Stanford University (Stanford). The proposed General Use Permit would authorize an additional increment of campus growth and land use development on Stanford's lands in unincorporated Santa Clara County, anticipated to take place over a period that would extend from approximately 2018 through 2035. Stanford seeks County approval of the proposed General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map. All of these approvals are collectively referred to as the "2018 General Use Permit" or the "Project" in this EIR. The County of Santa Clara has primary discretionary authority over the Project and serves as the lead agency responsible under the California Environmental Quality Act (CEQA).

This Summary includes the following sections

- Introduction
- Project Objectives
- Project Location
- Project Description
- Significant and Unavoidable Environmental Effects
- Alternatives
- Environmentally Superior Alternative
- Areas of Controversy and Issues to be Resolved
- Summary of Impacts and Mitigation Measures

1.2 Project Objectives

Stanford's objective is County approval of a 2018 General Use Permit that would authorize continued growth and development on the campus in a manner that implements the Stanford Community Plan's policies and that is consistent with the growth assumptions in the approved Sustainable Development Study. Stanford's more specific objectives are as follows:

- Continue to implement the policies of the Stanford Community Plan, including policies promoting compact urban development, housing, single-occupant vehicle trip reduction, resource conservation, and health and safety;

- Continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community ("flexibility with accountability");
- Authorize continuation of existing academic, academic support and housing uses on the Stanford campus;
- Enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities;
- Enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique Escondido Village Graduate Student Residences Project;
- Enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents;
- Prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing; and
- Support existing and new academic, academic support and housing uses by authorizing new and improved parking facilities, roadway, utility and infrastructure improvements, child care centers, facilities designed to promote vehicle trip reduction, and temporary trailers for construction surge space.

1.3 Project Location

Stanford is located on the San Francisco Peninsula, approximately 35 miles southeast of San Francisco, and 20 miles northwest of San Jose. The proposed 2018 General Use Permit would apply to the 4,017 acres of Stanford lands that are located within unincorporated Santa Clara County (hereafter referred to as the Project site). The Project site is generally located southeast of Sand Hill Road, southwest of El Camino Real, northwest of Stanford Avenue and Page Mill Road, north of Arastradero Road, and east of Alpine Road. Regional freeway access to the Project site is provided by U.S. Highway 101 (U.S. 101) and Interstate 280 (I-280).

1.4 Project Description

Stanford has applied for a new General Use Permit governing development on its lands in unincorporated Santa Clara County. The proposed 2018 General Use Permit would authorize an increment of campus growth and land use development, anticipated to take place over a period that would extend from approximately 2018 through 2035. Stanford seeks County approval of the proposed General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map. The proposed increment of future development would accommodate an amount of growth that corresponds to the 2035 Moderate Growth Scenario included in Stanford's Sustainable Development Study, approved by the County in 2009.

The proposed 2018 General Use Permit would allow:

- 2,275,000 net new square feet of academic and academic support facilities (plus any square footage remaining under the 2000 General Use Permit);
- 3,150 net new housing units/beds, of which up to 550 units would be available for faculty, staff, postdoctoral scholars, and medical residents;
- 40,000 net new square feet of childcare center space, and other space that reduces vehicle trips (e.g., transit hub);
- utilization of up to 50,000 square feet of construction surge space authorized under the 2000 General Use Permit;
- utilization of the remaining unbuilt parking authorized under the 2000 General Use Permit (estimated at 1,480 spaces remaining after completion of the Escondido Village Graduate Residences and associated parking in 2020);[1]
- creation of a parking reserve for up to 2,000 net new parking spaces (with Planning Commission approval); and
- associated infrastructure.

Similar to the 2000 General Use Permit, the proposed 2018 General Use Permit would apply to all land uses within unincorporated Santa Clara County that would require a conditional use permit, Architecture and Site Approval (ASA), or Planning Commission approval under the County Zoning Ordinance. The proposed 2018 General Use Permit would not apply to uses on Stanford lands that are permitted by right under the County Zoning Ordinance. However, all development that would be authorized to occur under the proposed 2018 General Use Permit, as well as development permitted by right, would be counted against the proposed 2018 General Use Permit development and housing unit limits.

New building square footage and housing, as well as most infrastructure subject to the proposed 2018 General Use Permit would be constructed on vacant land, infill sites and redevelopment sites within the Academic Growth Boundary. As occurred under the 2000 General Use Permit, some infrastructure improvements such as underground pipelines, electrical transmission lines, water supply improvements, and habitat improvements could occur outside the Academic Growth Boundary.

No site-specific projects and locations have been identified for development under the proposed 2018 General Use Permit. Each individual building or project that would be developed pursuant to the proposed 2018 General Use Permit would require submittal of an application to the County at the time proposed, and subject to additional discretionary review prior to consideration of approval by the County.

As proposed by Stanford, the 2018 General Use Permit would include conditions that would allow Stanford to request (1) additional housing beyond the proposed development limit of 3,150 housing units/beds; and/or (2) changes above-identified thresholds, in the distribution of academic, academic

[1] There are an estimated 3,156 remaining unbuilt parking spaces as of Fall 2015.

support, and housing development within the Academic Growth Boundary. As proposed, the 2018 General Use Permit would also include an option for Stanford to request construction of a parking reserve for up to 2,000 net new parking spaces contingent upon certain conditions being met. If and when Stanford would apply for any of these requests, each request would be subject to additional environmental review by the County, and approval by the Planning Commission.

The Stanford Community Plan establishes a "No Net New Commute Trips" standard, defined to mean no additional trips above a measured base level during the peak commute hours in the campus commute direction. Under its proposed 2018 General Use Permit, Stanford agrees to:

- continue to implement, and expand as needed, its Transportation Demand Management (TDM) programs to help Stanford achieve its No Net New Commute Trips standard;
- continue to implement its off-campus trip reduction programs as contemplated by the Stanford Community Plan's trip credit policy; and
- if needed, provide funding to the County for other programs to reduce trips within a defined area or for intersection improvements.

Further, Stanford proposes in the 2018 General Use Permit that if the No Net New Commute Trips standard cannot be achieved through trip reduction measures and trip credits alone, the standard can optionally be achieved by funding trip reduction programs (instead of funding intersection improvements, as is done currently) implemented by other entities in the vicinity, including programs that encourage and improve use of alternative transportation modes, and/or improve safety and mobility for pedestrians, bicyclists and transit users.

Under its proposed 2018 General Use Permit, Stanford agrees to continue to implement, and update as needed, its sustainability programs and practices. In addition, to further minimize impacts of development under its proposed 2018 General Use Permit, Stanford agrees to achieve the following:

- During the life of the 2018 General Use Permit, Stanford would meet final California Air Resources Board Tier 4 standards for all construction equipment, except for chainsaws and paving phase equipment;
- During the life of the 2018 General Use Permit, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place) to minimize potential noise and vibration disruption;
- All Marguerite buses would be electric by 2035;
- 70 percent of Stanford Land Buildings and Real Estate and Bonair fleet vehicles would be electric by 2035; and
- During the life of the 2018 General Use Permit, Stanford would rely heavily on low-water-demand, native plants for new landscaping.

Stanford also agrees to make following monetary contributions: 1) funding for affordable housing in the community; 2) funding for improvements to parks in the College Terrace neighborhood;

and 3) funding for four sets of off-campus bicycle facility improvements to reduce the potential for local congestion impacts by encouraging use of alternative modes.

The proposed Project includes no modifications to any strategies, policies or implementation measures in the Stanford Community Plan. However, Stanford proposes amendments to certain figures, tables and background text in the Stanford Community Plan.

Under the proposed Project, Stanford requests amendment to the County Zoning Map to change the Driving Range site from R3S (Medium-Density Campus Residential) zoning to A1 (General Use) zoning, and to change nine faculty houses from A1 to R1S (Low-Density Campus Housing).

1.5 Significant and Unavoidable Environmental Effects

Throughout this EIR, significant environmental impacts are identified, and mitigation measures are described that would eliminate the impacts or decrease them to a less-than significant level. Similarly, many impacts are identified that would be less-than-significant without the need for additional mitigation measures. There are, however, a number of impacts that are identified that cannot be eliminated or cannot be decreased to a level of insignificance even with the implementation of feasible mitigation measures. The key unavoidable significant environmental impacts include those listed in **Table 1-1**, below.

TABLE 1-1
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED PROJECT

Impacts
5.4 Cultural Resources
Impact 5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
Impact 5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources.
5.11 Noise and Vibration
Impact 5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity.
Impact 5.11-6: Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to significant cumulative noise impacts.
5.15 Transportation
Impact 5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
Impact 5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
5.17 Environmental Consequences of Stanford Providing Off-campus Housing Under Proposed Project
Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts.

1.6 Alternatives to the Proposed Project

This EIR presents a discussion of a reasonable range of alternatives to the proposed Project that would feasibly attain most of the Project's basic objectives, but that would avoid or substantially lessen any identified significant adverse environmental effects of the project. The alternatives are described below.

1. No Project Alternative, consisting of
    a. No Project/No Development Alternative; and
    b. No Project/Individual Use Permits Alternative;
2. Reduced Project Alternative;
3. Historic Preservation Alternative;
4. Additional Housing Alternative A; and
5. Additional Housing Alternative B

The comparative evaluation of these alternatives is presented in Chapter 7 of the EIR.

1.7 Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. If the No Project Alternative is considered the environmentally superior alternative, the EIR must identify which among the others is environmentally superior.

From the alternatives evaluated in this EIR, the environmentally superior alternative would be the No Project/No Development Alternative. Of the remaining alternatives that are not the No Project Alternative, the Reduced Project Alternative is considered the environmentally superior alternative.

1.8 Areas of Controversy

Areas of controversy known to the lead agencies, including issues raised by agencies and the public, must be identified in the Summary of an EIR (14 Cal. Code Regs. Section 15123).

On January 10, 2017, the County of Santa Clara sent a Notice of Preparation (NOP) to governmental agencies, organizations, and persons interested in the proposed Project to initiate the public scoping period for this EIR. The NOP is included in Appendix NOP of this EIR. The NOP notified and informed agencies and interested parties about the proposed Project, and the County of Santa Clara's decision to prepare an EIR; it included a request for agencies and the public to comment on environmental issues that should be addressed in the EIR. The County of Santa Clara also held a public scoping meeting on February 8, 2017 to receive oral comments on the scope of the EIR. The comments received in response to the NOP, both written and oral, are included in Appendix NOP Responses.

Based on the comments received during the public scoping period, issues of concern for the proposed Project include the following:

- Relationship of Project with other Stanford uses in nearby jurisdictions
- Potential future changes to the Academic Growth Boundary
- Potential health effects of encountering hazardous materials during construction
- Feasibility of reducing greenhouse gas emissions to levels below that required by CEQA, and of Stanford adopting policy of carbon neutrality
- Housing demand and supply on- and off-campus; need for providing more homes on-campus for Stanford staff and workers; effect on jobs-housing imbalance; and effect on displacement of existing residents from nearby communities; and impact of Project on housing prices in nearby communities
- Impacts of Project on local public school enrollment, capacity and services; and on childcare services.
- Impact of potential accidental hazardous materials releases caused by human error or emergency on sensitive receptors; notification and safety of first responders involving hazardous materials
- Expansion of traffic study area to key entry points in surrounding neighborhoods; extension of traffic analysis to cover non-peak hours; accounting for lengthening of peak traffic conditions when evaluating no net trips standard; expansion of cordon credit area
- Parking effects in local neighborhoods
- Cumulative effects and potential for Project to generate further development in the area
- Cumulative impacts beyond 2035
- Maximum buildout for the Stanford academic campus

Please also see Chapter 5, Section 5.0.2, Scope of Analysis, for a discussion of the approach for determining issues within the scope of this EIR.

1.9 Summary of Impacts and Mitigation Measures

Table 1-2 summarizes all of the impacts of the proposed Project, identifies the significance determination of each impact, and presents the full text of the recommended mitigation measures and improvement measures.

TABLE 1-2
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Visual and Scenic Resources		
Impact 5.1-1: The Project would not adversely affect scenic vistas. (*Less than Significant*)	None required.	Less than Significant
Impact 5.1-2: The Project could damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. (*Less than Significant*)	None required.	Less than Significant
Impact 5.1-3: The Project could degrade the existing visual character or quality of the site and its surroundings. (*Less than Significant*)	None required.	Less than Significant
Impact 5.1-4: The Project could create a new source of substantial light or glare that would adversely affect nighttime views in the area. (*Significant*)	**Mitigation Measure 5.1-4:** Stanford shall submit a lighting plan for approval by the County Planning Office, as part of an ASA review, for each development project that would include exterior light sources. The plan shall show the extent of illumination that would be projected from proposed outdoor lighting. State-of-the-art luminaries shall be used where necessary, with high beam efficiency, sharp cut-off, and glare and spill control. Upward glow shall not be allowed in residential or academic uses.	Less than Significant
Impact 5.1.5: The Project, in combination with past, present, and future projects could potentially contribute to cumulative visual and scenic resource impacts. (*Significant*)	**Mitigation:** Implement Mitigation Measure 5.1-4.	Less than Significant
Air Quality		
Impact 5.2-1: Project construction would not result in emissions of NOx, PM, and ROGs that would exceed BAAQMD significance thresholds. (*Less than Significant*)	None required.	Less than Significant
Impact 5.2-2: Project construction would generate fugitive dust that could result in a localized increase in particulate matter. (*Significant)*	**Mitigation Measure 5.2-2:** *Best Management Practices for Controlling Particulate Emissions.* Stanford shall require all construction contractors to implement the following measures: • All exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day; • All haul trucks transporting soil, sand or other loose material off-site shall be covered; • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweepers is prohibited; • All vehicle speeds on unpaved roads shall be limited to 15 mph; • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Air Quality (cont.)		
Impact 5.2-2 (cont.)	• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. Clear signage shall be provided for construction workers at all access points; • All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible emissions evaluator; and • Post a publicly visible sign with the telephone number and person to be contacted regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.	
Impact 5.2-3: Project construction would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*	**Mitigation Measure 5.2-3(a):** *Health Risk Screening for Construction Projects.* Prior to approval of an individual project, Stanford shall conduct a project-specific health risk screening using the screening distances presented in Table 5.2-8 and submit it to the County Planning Office for peer review and approval. If the individual project is located further from sensitive receptors than the minimum distance identified in Table 5.2-8, then no further construction health risk assessment or additional mitigation is required. If the construction project is closer than the specified minimum distance, then a project-specific Health Risk Assessment shall be prepared, as outlined in Mitigation Measure 5.2-3(b). **Mitigation Measure 5.2-3(b):** *Project-Specific Health Risk Analysis.* If the screening criteria in Table 5.2-8 are not met, Stanford shall prepare and submit to the County Planning Office for peer review and approval a project-specific health risk analysis demonstrating that project construction activities will not result in a significant acute, chronic non-cancer or cancer-related health risk to sensitive receptors. As a performance standard, any subsequent project-specific health risk analysis must demonstrate an excess cancer risk level of 10-in-1 million or less, a non-cancer (i.e., chronic or acute) hazard index of 1.0 or less, and an incremental increase an annual average $PM_{2.5}$ concentration of no more than 0.3 microgram per cubic meter.	Less than Significant
Impact 5.2-4: Project operational emissions from new development would not result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. (*Less than Significant)*	None required.	Less than Significant
Impact 5.2-5: Project operation of development would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant*)	**Mitigation Measure 5.2-5:** *Laboratory Fume Hood Emission Control*. For any individual project that contains more than 25,000 square feet of emissions-generating laboratory space within a building and 50 fume hoods, Stanford shall conduct a health risk screening analysis and obtain a permit from the BAAQMD for the proposed individual project; this permit may be required either prior to or as a condition of approval of the proposed individual project. In accordance with BAAQMD Rules 2-1 and 2-5, new sources of emissions must implement Best Available Control Technology for Toxics (T-BACT) if individual source risks exceed 1.0 in a million for cancer and/or	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Air Quality (cont.)		
Impact 5.2-5 (cont.)	chronic hazard index is greater than 0.20. Additionally, a permit will be denied if project cancer risk exceeds 10.0 in a million or if the chronic or acute hazard index exceeds 1.0. Compliance with BAAQMD rules will ensure that new laboratory operations will not result in a significant health risk impact.	
Impact 5.2-6: Proposed Project operations would not result in local concentrations of carbon monoxide that would exceed State and federal standards. (*Less than Significant*)	None required.	Less than Significant
Impact 5.2-7: Project operation of development would not create objectionable odors that would affect a substantial number of people. (*Less than Significant*)	None required.	Less than Significant
Impact 5.2-8: Project operation of development could conflict with or obstruct implementation of the applicable air quality plan. (*Potentially Significant*)	**Mitigation:** Implement the following mitigation measures: Mitigation Measure 5.15-2(a): *Mitigation through either a program of "no net new commute trips" or through contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.* Mitigation Measures 5.3-8(a)-(b): *Mitigation for native oak woodland.* Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands.* Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees*.	Less than Significant
Impact 5.2-9: The Project would not result in emissions of NOx, PM, or ROGs that are cumulatively considerable. (*Less than Significant*)	None required.	Less than Significant
Impact 5.2-10: The Project could considerably contribute to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*	**Mitigation:** Implement the following mitigation measures: Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.* Mitigation Measure 5.2-5: *Laboratory Fume Hood Emission Control*	Less than Significant
Biological Resources		
Impact 5.3-1: Project activities could result in adverse effects on special-status and migratory birds. (*Potentially Significant*)	**Mitigation Measure 5.3-1(a):** *Avoid tree removal and commencement of outdoor construction activities during nesting season.* Tree removal or pruning associated with project construction and commencement of outdoor project construction activities shall be avoided from February 1 through August 31, the primary local bird nesting season, to the extent feasible. If no tree removal or pruning associated with project construction is proposed during the nesting period and outdoor project construction activities will commence outside the nesting period, no surveys for active bird nests are required. Or	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-1 (cont.)	**Mitigation Measure 5.3-1(b):** *Survey for active bird nests within 250 feet of construction sites.* If the County Planning Office determines that compliance with Mitigation Measure 5.3-1(a) is not feasible because the timing of a construction project necessitates construction-related tree removal/pruning during the nesting season and/or commencement of outdoor construction activities during the nesting season, within seven days prior to the proposed start of construction activities an independent, qualified biologist approved by the County shall conduct a nesting bird survey of all potential habitat at the construction site and within 250 feet of the perimeter of the construction site. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. **Mitigation Measure 5.3-1(c):** *Minimize impacts to active bird nests.* If any active nests are detected during the pre-construction survey, an independent, qualified biologist approved by the County shall recommend a work-exclusion buffer zone that shall be designated around the active nest to allow for both the successful fledging of the birds and initiation of work on some portions of the project site. The work-exclusion zone(s) shall be reviewed and approved by the County Planning Office prior to commencement of construction. A qualified biologist shall monitor any occupied nest located within a protective buffer zone in order to determine if the designated buffer zone is effective and when the buffer zone is no longer needed. If the buffer zone is determined to be ineffective, its size shall be increased until it is effective, or work shall cease until the young have fledged and are independent of the nest. **Mitigation Measure 5.3-1(d):** *Delay activity***.** If no sufficient work-exclusion zone(s) are possible, then there shall be a delay in the start of construction until the active nest is no longer occupied. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used. **Mitigation Measure 5.3-1(e):** *Remove nest starts.* A qualified biologist can visit project sites at any time prior to tree removal or the initiation of outdoor construction work in order to find and remove nest starts which do not have eggs or nestlings present. This activity will minimize impacts to birds as they will generally move elsewhere and restart their nest building process.	
Impact 5.3-2: Project activities could result in adverse effects on special-status bats. (*Potentially Significant*)	**Mitigation Measure 5.3-2(a):** *Conduct pre-project survey.* Prior to project construction, an independent, qualified bat biologist approved by the County shall conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be demolished within the work area and within a 50-foot radius of the work area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. If no roosting bats are found, no further action is required. If a bat roost is found, Stanford shall implement the following measures to avoid impacts on roosting bats. **Mitigation Measure 5.3-2(b):** *Evict non-maternal roosts.* If a non-maternal roost of bats is found in a tree or structure to be removed or demolished as part of project construction, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Removal or demolition should occur no sooner than at least two nights after the initial minor site modification (to alter airflow). This action allows bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of disturbance.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-2 (cont.)	Departure of the bats from the construction area shall be confirmed with a follow-up survey by a qualified bat biologist prior to start of construction. **Mitigation Measure 5.3-2(c):** *Avoid maternal roosting areas.* If active maternity roosts are found in trees or structures that will be removed or demolished as part of project construction, tree removal or demolition of that structure shall commence and be completed before maternity colonies form (generally before March 1) or shall not commence until after young are flying (generally after July 31). Active maternal roosts shall not be disturbed. **Mitigation Measure 5.3-2(d):** *Develop and employ bat nest box plan.* If special-status bats are found in trees or structures to be removed or demolished as part of project construction, Stanford shall develop and implement a Bat Nest Box Plan for the Stanford campus employing current bat nest box technology. The design and placement of nest boxes shall be reviewed by an independent, qualified bat biologist and shall be consistent with Stanford's anticipated long-term planning and development activities.	
Impact 5.3-3: Project activities could result in adverse effects on the San Francisco dusky-footed woodrat. (*Potentially Significant*)	**Mitigation Measure 5.3-3(a):** *Surveys.* Prior to any clearing of vegetation within the Lathrop Development District, Lagunita and adjacent uplands, jurisdictional waterways/wetlands, or lands on the Project site outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a survey for San Francisco dusky-footed woodrat nests within the project area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. **Mitigation Measure 5.3-3(b):** *Avoidance***.** Where feasible, an exclusion buffer of at least 10 feet from these nests shall be established and clearly demarcated to avoid moving or bumping the nests or the logs or branches on which the nests rest. **Mitigation Measure 5.3-3(c):** *Mitigation.* If establishing a buffer and avoiding the nests is not feasible, the nests shall be dismantled and the nesting material moved to a new location outside the project's impact areas so that it can be used by woodrats to construct new nests. Prior to nest deconstruction, each active nest shall be disturbed by a qualified wildlife biologist to the degree that all woodrats leave the nest and seek cover out of the impact area. Whether the nest is on the ground or in a tree, the nest shall be slightly disturbed (nudged) to cause the woodrats to flee. For tree nests, a tarp shall be placed below the nest and the nest dismantled using hand tools (either from the ground or from a lift). The nest material shall then be piled at the base of a nearby tree or large shrub outside of the impact area.	Less than Significant
Impact 5.3-4: Project construction activities could result in adverse effects on special-status plant species. (*Potentially Significant*)	**Mitigation Measure 5.3-4(a):** *Surveys.* If construction is proposed within any jurisdictional waterways/wetland areas, Lagunita basin and adjacent uplands, the Lathrop Development District, or Project site lands outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a focused survey for special-status plant species prior to ground disturbance during the late winter/early spring period when most local native plant species are flowering and most easily identified. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. If special status plant	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-4 (cont.)	surveying during flowering period is not possible, development within sensitive habitat areas shall be avoided unless approved by CDFW and the County Planning Office. **Mitigation Measure 5.3-4(b):** *Avoidance.* Construction activities shall avoid impacts to special-status plant species by establishing a buffer zone around the individuals in question. The buffer size shall be determined by an independent, qualified biologist approved by the County in order to avoid potential disturbance. The width of the buffer shall depend on a consideration of site-specific characteristics, including the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, soils, physical and chemical characteristics) and adjacent uses (e.g., sprinkler irrigation or shading from buildings or other structures). The buffer zone shall be clearly demarcated using exclusion fencing. **Mitigation Measure 5.3-4(c):** *Mitigation if avoidance is not feasible.* If the County Planning Office determines that establishing an avoidance buffer is not feasible, individual plants (including seeds) shall be transplanted to an area with suitable physical and biological conditions on the Project site outside of the Academic Growth Boundary and monitored and adaptively managed for five years. Transplantation may be accomplished by relocating individual plants or through seed collection and dispersal, or a combination of both, to be determined based on the species.	
Impact 5.3-5: Project activities would not result in significant effects on federal and state protected species covered by the Stanford Habitat Conservation Plan. (*Less than Significant*)	None required.	Less than Significant
Impact 5.3-6: Project activities could result in significant effects on steelhead. (*Potentially Significant*)	**Mitigation Measure 5.3-6(a):** *Habitat avoidance*. Grading or ground-disturbing activities within 150 feet of the top of bank of a creek that supports steelhead shall be avoided. **Mitigation Measure 5.3-6(b):** *Protective measures*. If the County Planning Office determines that avoidance of steelhead habitat is not feasible, Stanford shall obtain any required permits and approvals from federal and state wildlife agencies as well as a Streambed Alteration Agreement. Such permits and approvals shall specify the conditions under which construction activities may occur, including any applicable construction windows, installation of coffer dams or other measures necessary to protect steelhead.	Less than Significant
Impact 5.3-7: Project activities could result in substantial loss or degradation of riparian habitat. (*Potentially Significant*)	**Mitigation Measure 5.3-7(a):** Grading or ground-disturbing activities within 150 feet of riparian habitat shall be avoided. **Mitigation Measure 5.3-7(b):** If the County Planning Office determines that avoidance is not feasible, Stanford shall obtain all appropriate permits for wetland or other work within the riparian area from the Corps, USFWS, NMFS and CDFW. As specified by agency permits, any riparian habitat areas lost as a result of project development would be replaced through the creation, preservation or restoration of equivalent habitat at an appropriate mitigation ratio or through other measures that the agencies deem appropriate and approve in order to adequately mitigate the impact.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-8: Project activities could result in the loss of native oak woodland habitat. (*Potentially Significant*)	**Mitigation Measure 5.3-8(a):** Prior to oak tree removal within the Lathrop Development District, a tree removal plan and arborist report shall be submitted which identifies the species type, acreage, diameter, and amount of canopy of oak trees proposed for removal. The arborist report shall be prepared by an I.S.A. Certified Arborist, Registered Professional Forester, or another professional approved by the County Planning Office. **Mitigation Measure 5.3-8(b):** If the proposed oak tree removal would result in a decrease of 0.5-acre or more of native oak canopy on the project site, at least two of the following three mitigation measures shall be implemented: 1) *Planting Replacement of Oak Trees*. Pursuant to Public Resources Code Section 21083.4, the planting of oaks shall not fulfill more than 50 percent of the mitigation requirement for the project. Tree replacement can be dependent upon the size of the canopy of the removed trees, the number of trees to be removed, the size of trees to be removed, the type of trees to be removed, the steepness of the slope on which trees will be removed, or the amount of room on a parcel in which trees can be planted. The objective of tree planting shall be to restore former oak woodland at a ratio of 2:1 or 3:1 based on the condition of the oak woodland habitat. 2:1 restoration is recommended for medium quality oak woodland habitat, and 3:1 restoration is recommended for high quality oak woodland habitat. The following standard mitigation ratios shall be used, unless a different ratio is applied by the Planning Office based on site-specific characteristics: • For the removal of one small tree (5-18 inches): two 24-inch boxed trees or three 15 gallon trees. • For the removal of 1 medium tree (18-24 inches): three 24-inch boxed trees or four 15 gallon trees. • For the removal of a tree larger than 24 inches: four 24-inch boxed trees or five 15 gallon trees. All tree replacement shall be with in-kind species, unless alternate species are approved by the county. A Tree Planting and Maintenance Plan shall be submitted showing species, size, spacing and location of plantings and the location and species of established vegetation. Tree plantings shall be monitored for five years following planting and a survival rate of 75% will be required. Should the planted trees fail to meet the established performance and survival criteria, Stanford shall be responsible for additional plantings and management activities necessary to ensure the long-term success of planted mitigation trees. 2) *Conservation Easement*. Protect existing native oak trees on or off the project site from future development through a conservation easement or fee title dedication to the County or a land conservation group approved by the County.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-8 (cont.)	Oak woodland offered as mitigation must be configured in such a manner as to best preserve the integrity of the oak ecosystem and minimize the ratio of edge to area. Priority should be given to conserving oak habitat adjacent to existing woodlands under conservation easements, public lands or open space lands. The protection of existing oak woodlands through conservation easements shall mitigate for the loss of oaks at a ratio equal to 2:1 (for medium quality oak woodland habitat) or 3:1 (for high quality oak woodland habitat) as determined by the County Planning Office. Land proposed as mitigation, when viewed with adjacent protected conservation land, should not result in conserved parcels of less than one acre. 3) *Other Options*. If the County Planning Office determines that there are no feasible sites for oak woodland mitigation on Stanford lands, then Stanford shall submit a plan for review and approval by the County Planning Office that provides for the conservation of oak woodlands elsewhere in Santa Clara County in the same manner as 5.3-8(b)(2). This plan must include protection of an existing oak ecosystem through a conservation easement or fee title dedication to the County or other local agency or organization responsible for the oak woodlands preservation.	
Impact 5.3-9: Project construction activities could result in substantial adverse effects on jurisdictional waters and wetlands. (*Potentially Significant*)	**Mitigation Measure 5.3-9(a):** *Jurisdictional waters and wetland identification.* Stanford has provided a wetland delineation that covers the lands within the Academic Growth Boundary. Prior to grading or ground-disturbing activities on lands outside the Academic Growth Boundary, the County shall determine whether the existing wetland delineation is adequate to assess the project's impacts and, if not, an independent, qualified wetland biologist approved by the County shall delineate jurisdictional waters or wetlands on and within 250 feet of the construction site. **Mitigation Measure 5.3-9(b):** *Jurisdictional waters and wetlands avoidance.* For all projects grading or ground-disturbing activities within 250 feet of jurisdictional waters or wetlands shall be avoided unless the County Planning Office determines that avoidance is not feasible. **Mitigation Measure 5.3-9(c):** *Jurisdictional waters or wetland replacement.* If the County Planning Office determines that avoidance of jurisdictional waters or wetlands is not feasible, Stanford shall obtain all appropriate permits or approval for work in jurisdictional waters (i.e., Waters of the State or Waters of the U.S.), from applicable agencies, including but not necessarily limited to, the U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, and California State Department of Fish and Wildlife. Any jurisdictional waters or wetlands that are filled as a result of project development shall be replaced through the creation, preservation or restoration of jurisdictional waters or wetlands or through other measures that the agencies deem appropriate through permit requirements to adequately mitigate the impact. Potential measures may include the following: • For creek projects, remove hardscape features from the stream channel and stream banks. • Stabilize exposed slopes or streambanks immediately upon completion of construction activities.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-9 (cont.)	• To restore disturbed aquatic sites, a wetland mitigation and monitoring plan will be prepared that outlines the objectives to mitigate for construction impacts. At a minimum the plan will include thresholds of replanting success (e.g., 90 percent plant survival after one year, 80 percent second year, and 70 percent third year), monitoring requirements (e.g., at least once each year to confirm site stability, plant viability, and to schedule weeding, as needed), and shall specify resource agency reporting requirements.	
Impact 5.3-10: Implementation of the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant*)	None required.	Less than Significant

Impact 5.3-11: Implementation of the project could conflict with local Santa Clara County tree preservation ordinance. (*Potentially Significant*)	**Mitigation Measure 5.3-11(a):** A "tree" is defined a woody plant having a single trunk measuring at least 37.7 inches in circumference (12 inches or more in diameter) or in the case of multi-trunk trees, a trunk size of 75.4 inches in circumference (24 inches in diameter). A protected tree on the Stanford campus is a:
	• heritage tree (if included on the County's heritage resource inventory adopted by resolution of the Board of Supervisors);
	• a tree planted or retained as required by conditions of approval of County permits;
	• and a tree located within County rights-of-way and easements.
	Stanford shall not remove a protected tree unless:
	1. Removal of the protected tree is authorized by a County land use approval for which a grading or building permit has been issued.
	2. Removal of the protected tree is authorized by a County-issued administrative permit or encroachment permit for tree removal; or
	3. Removal of the protected tree is exempt. In addition to trees removed pursuant to a County land use approval, the ordinance currently exempts removal of a protected tree in the following circumstances:
	  • the tree is diseased, dead, or dying or substantially damaged from natural causes;
	  • tree cutting is needed to remove a hazard to life and personal property; and
	  • maintenance work within public utility easements
	Mitigation Measure 5.3-11(b): Issuance of a land use permit, administrative permit or encroachment permit that authorizes removal of a protected tree shall be conditioned as follows:
		Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)		
Impact 5.3-11 (cont.)	1. Protected trees shall be replaced at a ratio of 3:1 for oaks and 1:1 for other protected trees; or 2. Stanford may submit a Vegetation Management Plan for the entire campus to the County Planning Office for review and approval. This plan must provide for the same or greater level of tree protection as the measures described in Mitigation Measure 5.3-11(b)(1).	
Impact 5.3-12: Implementation of the Project could cumulatively cause an adverse impact to biological resources. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measures 5.3-1(a)-(b), 5.3-2(a)-(d), 5.3-3 (a)-(c), 5.3-4(a)-(b), 5.3-6(a)-(c), 5.3-7(a)-(b), 5.3-8(a)-(b), 5.3-9(a)-(c), and 5.3.11(a)-(c).	Less than Significant
Cultural Resources		
Impact 5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. (*Significant*)	**Mitigation Measure 5.4-1(a):** The Stanford University Historic Resources Survey dated April 2017 contains an evaluation of all buildings and structures located within the Stanford Community Plan's Academic Campus land use designation that were constructed prior to 1976. Prior to 2025, Stanford shall provide to the County Planning Office for the review and approval of the County Planning Director (or designated representative) an additional survey of structures built within the Academic Campus land use designation between 1976 and 1985 ("Survey Addendum"). At its discretion, the County Planning Office may require a peer review of the Survey Addendum by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense. **Mitigation Measure 5.4-1(b):** For any building project that involves demolition of an historical resource that is listed or has been identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review of the project. Consistent with the County's process the analysis of project impacts, alternatives and mitigation will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to approval. **Mitigation Measure 5.4-1(c):** For any proposed building project that involves remodeling, alteration, or a potential physical effect on an historical resource that is listed or identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, Stanford shall meet the following requirements: 1) The proposed building project shall be consistent with the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1995) ("Secretary of Interior's Standards"). Stanford shall submit documentation to the County prepared by a qualified professional to demonstrate consistency of the proposed project with the Secretary of the Interior's Standards. If the work to be performed constitutes basic maintenance, repair or replacement, Stanford shall mark the project plans with text stating: "Exterior work is limited to replacement of deteriorated materials with in-kind materials that match the old. Project plans have been reviewed by [Name of Architect], who has determined the work would comply with the Secretary of Interior's Standards." If the work to be performed is more extensive than basic	Significant and Unavoidable.

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

<table>
<tr><th>Environmental Impact</th><th>Mitigation Measures</th><th>Level of Significance after Mitigation</th></tr>
<tr><td colspan="3">Cultural Resources (cont.)</td></tr>
<tr><td>Impact 5.4-1 (cont.)</td><td>maintenance, repair or replacement in kind, Stanford shall submit a letter along with the project plans explaining the basis for the University Architect's Office determination that the work would comply with the Secretary of Interior's Standards. The County Planning Office will review the marked plans or letter, and may require additional documentation.

2) The requirement that the building project must be consistent with the Secretary of the Interior's Standards shall be primarily limited to alterations to the exterior. Building interiors will be exempt from such a consistency requirement, except for interior spaces that are open to the general public on an ongoing basis. Such buildings are listed below along with their public interior spaces.
<table>
<tr><th>Historic Resource</th><th>Primary public space(s) subject to review (if integrity present)</th><th>Secondary space(s): no review required</th></tr>
<tr><td>Cantor Center/ Stanford Museum</td><td>Lobby and galleries on first and second floors of 1891 and 1902 wings</td><td>Restrooms, staff offices, collection storage areas, all basement areas and all spaces in 1999 addition</td></tr>
<tr><td>Memorial Church</td><td>Main sanctuary, entry vestibule, organ and choir lofts</td><td>Restrooms, offices and store rooms, all basement areas</td></tr>
<tr><td>Art Gallery</td><td>Vestibule and gallery space</td><td>Restrooms, offices and store rooms, all basement areas</td></tr>
<tr><td>Hoover Tower</td><td>Lobby, galleries, observation platform</td><td>Restrooms, offices and store rooms, all basement areas</td></tr>
<tr><td>Memorial Hall</td><td>Lobby, Pigott Theater, Auditorium</td><td>Restrooms, offices and store rooms, radio station</td></tr>
<tr><td>Frost Amphitheater</td><td>Terraces, stage</td><td>Restrooms, store rooms</td></tr>
<tr><td>Burnham Pavilion/ Ford Center</td><td>Lobby, main gym</td><td>Restrooms, locker rooms, offices, store rooms; all spaces in 1990 addition</td></tr>
</table>
3) The County Planning Office may require a peer review of the Secretary of the Interior's Standards consistency analysis by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.

4) If it is not feasible for the building project to be consistent with the Secretary of Interior's Standards, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review. The analysis of impacts, alternatives and mitigation measures will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to County approval.</td><td></td></tr>
</table>

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Cultural Resources (cont.)		
Impact 5.4-1 (cont.)	**Mitigation Measure 5.4-1(d):** For any building project that involves demolition, modification or significant alteration of a structure located outside of the Academic Campus land use designation that is 50 years old or more, Stanford may elect to follow the Secretary of Interior's Standards. If Stanford does not elect to follow the Secretary of Interior's Standards for such a project Stanford shall submit an assessment regarding its eligibility for listing on the California Register ("Eligibility Assessment") to the County Planning Office. If the County Planning Office determines that the building/structure is eligible for listing on the California Register, then Stanford shall comply with the provisions in Sections 2 and 3 above and the building/structure shall be treated as if it were identified as eligible for listing in the Stanford Historic Resources Survey or Addendum for purposes of those Sections. The County Planning Office may require a peer review of the Eligibility Assessment by a qualified professional (Architect or Architectural Historian) at Stanford's expense. **Mitigation Measure 5.4-1(e):** Proposed new buildings located within 75 feet of an historic resource that is identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey, Survey Addendum or Eligibility Assessment, measured from the nearest exterior walls, shall be reviewed by the University Architect to ensure that the design does not negatively impact the historic resources surrounding it. Stanford shall prepare design guidelines and submit a letter to the County Planning Office confirming that the new building construction has been reviewed by the University Architect's Office and is compatible with any historic resources located within 75 feet of the proposed new building. The County Planning Director (or designated representative) will review the letter prior to County approval of the new building. The County Planning Office may require a peer review of the University Architect's evaluation prior to approval of the building.	
Impact 5.4-2: Project development could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Potentially Significant*)	**Mitigation Measure 5.4-2(a):** Stanford has provided a map to the County Planning Office, maintained as a confidential record, that shows the location of all known prehistoric and historic archaeological resources in the unincorporated Santa Clara County portion of Stanford lands. Stanford shall conduct a Record Search at the Northwest Information Center of the California Historical Resources Information System and submit an updated map each year as part of the 2018 General Use Permit annual monitoring and compliance process. This annual update will be the basis for evaluating potential impacts of future projects that include ground disturbance. At the discretion of the County Planning Office, project-related archaeological site assessments and monitoring shall be conducted and mitigation measures identified by either the Stanford University Archaeologist or an independent archaeologist retained by the County at Stanford's expense. All archaeological reports (including, but not limited to, site assessments, monitoring reports, Archaeological Treatment Plans) shall be forwarded to the County Planning Office for review at Stanford's expense. All work shall be performed by, or under the supervision of, an archaeologist that meets the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Cultural Resources (cont.)		
Impact 5.4-2 (cont.)	Significant impacts from projects on prehistoric and historic archaeological resources shall be addressed as specified below: 1. If a building project is proposed to be situated on a mapped archaeological site, a qualified archaeologist shall conduct further project-specific analysis to determine whether a significant impact would occur. If the site is determined to be eligible and cannot be avoided, an Archaeological Resources Treatment Plan shall be prepared and approved by the County Planning Office prior to the commencement of ground disturbing activities. If a Stanford archaeologist performs this work, the County may at its discretion require a peer review by an independent qualified archaeologist at Stanford's expense. Project-specific mitigation, if necessary, shall be identified in accordance with the provisions of Section 21083.2 of the Public Resources Code. 2. In the event that previously unidentified historic or prehistoric archaeological resources are discovered during construction, the contractor shall cease work in the immediate area and the County Planning Office and University Archaeologist shall be contacted immediately. The University Archaeologist shall provide and implement a proposed Archaeological Resources Treatment Plan. At the discretion of the County Planning Director (or designated representative) an independent qualified archaeologist may be retained by the County at the expense of Stanford to assess the significance of the find and the adequacy of the proposed Archaeological Resources Treatment Plan. 3. Archaeological monitoring shall be conducted at any time construction-related ground-disturbing activities (greater than 12 inches in depth) are taking place within 100 feet of known archaeological resources. A technical report including the results of all monitoring activities shall be prepared once monitoring is completed in accordance with professional standards and submitted to the University Archaeologist. The archaeological monitoring shall be conducted or supervised by an individual meeting the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61). **Mitigation Measure 5.4-2(b):** In the event that human skeletal remains are encountered, Stanford is required by County Ordinance No. B6-18 to immediately notify the County Coroner. Work shall immediately stop within a 100-foot radius of the find. If the County Coroner determines that the remains are Native American, the coroner shall contact the California Native American Heritage Commission, pursuant to Health and Safety Code Section 7050.5(c), and the County Coordinator of Indian affairs. No further disturbance of the site may be made except as authorized by the County Coroner. If artifacts are found in association with the human skeletal remains no further disturbance of the artifacts may be made until authorized by the County Planning Office. It is the responsibility of Stanford to provide for reburial of the human skeletal remains and associated artifacts following completion of the required Native American consultation process described Health and Safety Code section 7050.5 (c); Stanford will file a State Record Form (DPR Series) documenting the reburial location with the California Historical Resources Information System and provide the location on the updated map provided for in Section 3 above.	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Cultural Resources (cont.)		
Impact 5.4-3: Project development could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Potentially Significant*)	**Mitigation Measure 5.4-3:** In the event that potentially significant fossilized shell or bone is uncovered during any earth-disturbing operation, contractors shall stop work within 100 feet of the find and notify the University Archaeologist and the County Building Inspector assigned to the project. The University Archaeologist shall visit the site and make recommendations for treatment of the find (including but not limited to consultation with a paleontologist and excavation, if warranted), which shall be sent to the County Building Inspection Office and the County Planning Office. If a fossil find is confirmed, it will be recorded with the United States Geological Survey and curated in an appropriate repository.	Less than Significant
Impact 5.4-4: Project Development could disturb human remains, including those interred outside of dedicated cemeteries. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measure 5.4-2(b).	Less than Significant
Impact 5.4-5: Project development could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measure 5.4-2(a)-(b).	Less than Significant
Impact 5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources.	**Mitigation:** Implement Mitigation Measure 5.4-1(a)-(e).	Significant and Unavoidable
Impact 5.4-7: Ground-disturbing activities undertaken as part of the Project could cumulatively cause a substantial adverse change in the significance of an archaeological resource, paleontological resource, or tribal cultural resource, or disturb human remains during construction. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measure 5.4-2(a)-(b) and Mitigation Measure 5.4-3.	Less than Significant
Energy Conservation		
Impact 5.5-1: Project development would not result in the use of fuel, water, or energy in wasteful or inefficient manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Energy Conservation (cont.)		
Impact 5.5-2: Project development, in conjunction with other cumulative development and growth, would not contribute to cumulative increases in demand for energy which would result in the use of large amounts of fuel, water, or energy, or use these in wasteful manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)	None required.	Less than Significant
Geology and Soils		
Impact 5.6-1: Project construction would not result in substantial soil erosion or loss of topsoil. (*Less than Significant*)	None required.	Less than Significant
Impact 5.6-2: Project development would not expose people or structures to substantial adverse effects from ground shaking. (*Less than Significant*)	None required.	Less than Significant
Impact 5.6-3: Project development would not expose people or structures to potential substantial adverse effects associated with liquefaction or lateral spreading, including the risk of loss, injury or death, in the event of a major earthquake on one of the regional active faults. (*Less than Significant)*	None required.	Less than Significant
Impact 5.6-4: Project development would not expose people or structures to potential substantial adverse effects associated with landslides, including the risk of loss, injury or death, in the event of a major earthquake on one of the other regional active faults. (*Less than Significant*)	None required.	Less than Significant
Impact 5.6-5: Project development would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant*)	None required.	Less than Significant
Impact 5.6-6: Project development would not result in substantial adverse effects from on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse as a result of being located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project development. (*Less than Significant*)	None required.	Less than Significant
Impact 5.6-7: Development under the proposed Project would not be located on expansive soils that would create substantial risks to life or property. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Geology and Soils (cont.)		
Impact 5.6-8: Development facilitated by the proposed Project, combined with past, present, and reasonably foreseeable probable projects, would not result in substantial adverse cumulative impacts to geology, soils, or seismic hazards. (*Less than Significant*)	None required.	Less than Significant.
Greenhouse Gas Emissions		
Impact 5.7-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a cumulatively considerable contribution to global climate change. (*Less than Significant*)	None required.	Less than Significant
Impact 5.7-2: The Project could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*Potentially Significant*)	**Mitigation:** Implement the following mitigation measures: Mitigation Measure 5.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.* Mitigation Measures 5.3-8(a)-(b): *Mitigation for native oak woodland.* Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands.* Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees*.	Less than Significant
Hazards and Hazardous Materials		
Impact 5.8-1: Under the proposed Project, demolition of existing structures that contain hazardous building materials would not create a significant hazard associated with exposure of workers, the public, or the environment from the transport, use, or disposal of these hazardous materials and waste. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-2: Under the proposed Project, construction projects could disturb soil and groundwater contaminated by historical hazardous material use, which could present risks the health of construction workers, the public, and/or the environment. (*Potentially Significant*)	**Mitigation Measure 5.8-2(a):** During construction within the Project site, any contractor shall cease any earthwork activities upon discovery of any suspect soils or groundwater (e.g., petroleum odor and/or discoloration) during construction. The contractor shall notify Stanford's Department of Environmental Health and Safety (EH&S) and the County of Santa Clara's Hazardous Materials Compliance Division (HMCD) of the Department of Environmental Health upon discovery of suspect soils or groundwater. EH&S will retain a qualified environmental firm to collect soil samples to confirm the level of contamination that may be present. **Mitigation Measure 5.8-2(b):** If contamination is found to be present, any further proposed soil- or groundwater-disturbing activities within areas of identified or suspected contamination shall be conducted according to a site specific health and safety plan, prepared by a California state licensed professional. The contractor shall follow all procedural direction given by County HMCD and/or identified in a Soil and Groundwater Management Plan prepared for the site by a qualified	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Hazards and Hazardous Materials (cont.)		
Impact 5.8-2 (cont.)	environmental firm to ensure that suspect soils are isolated, protected from runoff, and disposed of in accordance with transportation laws and the requirements of the licensed receiving facility (in coordination with EH&S). **Mitigation Measure 5.8-2(c):** If contaminated soil or groundwater is encountered and identified constituents exceed human health risk levels, it shall be delineated, removed, and disposed of offsite in compliance with the overseeing agency, either County HMCD or Regional Water Quality Control Board (RWQCB), as well as the receiving facilities' requirements.	
Impact 5.8-3: Improper handling or storage of hazardous materials during Project construction activities could result in spills would not significantly increase public health and/or safety risks to future residents, maintenance workers, visitors, and the public and environment in the area surrounding the spill. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-4: Operation of uses developed under the proposed Project that could involve the transportation, use, storage and disposal of hazardous materials, would not present significant public health and/or safety risks to residents, visitors, and the surrounding area. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-5: Hazardous materials used at facilities operating under the Project could potentially be spilled through upset or accidental conditions, but would not significantly increase public health and/or safety risks to future residents, workers, visitors, and the surrounding area. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-6: New development under the proposed Project could potentially be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thus, could result in a safety hazard to the public or environment. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measure 5.8-2(a)-(c).	Less than Significant
Impact 5.8-7: Implementation of the Project could result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school, but would not create a significant hazard to those facilities. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-8: Development facilitated by the Project would not substantially impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Hazards and Hazardous Materials (cont.)		
Impact 5.8-9: Development under the Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-10: Hazards at the Project site, in combination with past, present, and future projects could potentially contribute to cumulative hazards. (*Potentially Significant*)	**Mitigation:** Implement Mitigation Measures 5.8-2(a)-(c).	Less than Significant
Impact 5.8-11: The Project, in combination with past, present, and future projects would not substantially impair implementation or physically interfere with emergency response or evacuation plans. (*Less than Significant*)	None required.	Less than Significant
Impact 5.8-12: The Project, in combination with past, present, and future projects would not substantially contribute cumulatively to exposure to wildland fires. (*Less than Significant*)	None required.	Less than Significant
Hydrology and Water Quality		
Impact 5.9-1: Project construction could violate water quality requirements or waste discharge requirements, or otherwise degrade water quality. (*Potentially Significant*)	**Mitigation Measure 5.9-1:** Prior to issuance of a demolition or building permit, Stanford shall review its historic wells survey and confirm that no historic wells not properly closed are located at the project location to determine the potential for encountering any groundwater wells within the area of proposed improvements. If discovered, and the well is no longer part of operations and was not abandoned in accordance with SCVWD requirements, Stanford shall fulfill the well abandonment/destruction permit requirements. Stanford shall contact SCVWD to locate existing inactive wells and confirm adherence to well abandonment/ destruction requirements.	Less than Significant
Impact 5.9-2: Project construction could include temporary dewatering, but would not substantially deplete groundwater supplies or cause a lowering of the water table. *(Less than Significant)*	None required.	Less than Significant
Impact 5.9-3: Operation of the Project would not violate water quality requirements or waste discharge requirements, or otherwise substantially degrade water quality. *(Less than Significant)*	None required.	Less than Significant
Impact 5.9-4: Project operation could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. (*Potentially Significant*)	**Mitigation Measure 5.9-4:** Stanford Utilities shall review individual projects proposed under the 2018 General Use Permit for changes in impervious surface area within the Unconfined Groundwater Zone. The accounting of the recharge effort shall be tracked to ensure that all future development will continue to result in an annual net positive recharge in the Unconfined Groundwater Zone. Record of monitored data shall be submitted to the County on an annual basis and Santa Clara Valley Water District and include both water volumes and water quality data.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Hydrology and Water Quality (cont.)		
Impact 5.9-5: Project development would potentially alter the drainage pattern of the Project site, but would not result in substantial erosion or siltation on or off the site. (*Less than Significant*)	None required.	Less than Significant
Impact 5.9-6: Project development would create runoff, but would not exceed the capacity of existing or planned stormwater infrastructure, or result in flooding on- or off-site. (*Less than Significant*)	None required.	Less than Significant
Impact 5.9-7: The Project, in combination with past, present, and future projects could potentially contribute to surface and groundwater quality impacts. *(Potentially Significant)*	**Mitigation:** Implement Mitigation Measure 5.9-1.	Less than Significant
Impact 5.9-8: The Project, in combination with past, present, and future projects could potentially contribute to depletion in groundwater supplies or interfere with groundwater recharge. *(Potentially Significant)*	**Mitigation:** Implement Mitigation Measure 5.9-4.	Less than Significant
Impact 5.9-9: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative surface hydrology impacts. (*Less than Significant*)	None required.	Less than Significant
Land Use and Planning		
Impact 5.10-1: The Project could conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant*)	None required.	Less than Significant
Impact 5.10-2: The Project, in combination with past, present, and future projects could potentially contribute to cumulative land use impacts. (*Less than Significant*)	None required.	Less than Significant
Noise and Vibration		
Impact 5.11-1: The Project could expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction. (*Significant*)	**Mitigation Measure 5.11-1:** *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* If construction would be within 150 feet of off-site sensitive receptors, Stanford shall employ noise attenuation measures to reduce the generation of construction noise to achieve a performance standard of 75 dBA at the affected property line of the nearest off-site single family residential receptor and 80 dBA at the affected property line of the nearest off-site multi-family residential receptor. These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards set forth in the County Ordinance Code.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Noise and Vibration (cont.)		
Impact 5.11-1 (cont.)	Additional measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies: • For construction within the Project site that would be 150 feet of sensitive receptors located within the City of Palo Alto, hours of construction activity shall be restricted to those established in the City of Palo Alto Noise Ordinance (i.e., between the hours of eight a.m. to six p.m. Monday through Friday, and between nine a.m. and six p.m. on Saturday). For construction within the Project site that would be 150 feet of sensitive receptors located within all other residential areas, hours of construction activity shall be restricted to those established in the Santa Clara County Noise Ordinance (i.e., between seven a.m. and seven p.m., Monday through Saturday). • Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 75 dBA; • Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and • Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures. Emission of sound in the performance of emergency work is exempt from these requirements. In addition, variances to these restrictions may be allowed, with County approval, for certain utility work or other construction for which nighttime work would avoid secondary impacts (e.g., traffic impacts during commute periods); and where compliance with the noise thresholds is technically or economically infeasible. A variance may be granted only where the activity will not create a nuisance and will not be detrimental to the public health and safety.	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Noise and Vibration (cont.)		
Impact 5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity. (*Significant*)	**Mitigation:** Implement Mitigation Measure 5.11-1 noise impacts at off-site receptors. **Mitigation Measure 5.11-2:** *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* For construction activities over two weeks in duration, and within 150 feet of on-site sensitive receptors, Stanford shall identify noise attenuation measures to reduce the generation of construction noise to achieve a minimum performance standard of 80 dBA, Leq over an 8-hour period at the nearest on-site residential or day care land use.[2] These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards. If necessary to achieve the minimum performance standard stated above, measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies: • Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 80 dBA; • Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and • Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.	Significant and Unavoidable
Impact 5.11-3: Project construction could result in temporary exposure of persons to or generation of, excessive groundborne vibration or groundborne noise levels in the Project site vicinity. (*Significant*)	**Mitigation Measure 5.11-3:** *Construction Vibration Reduction Plan.* If construction involving vibratory rollers, hoe rams, or large bulldozers is proposed within 40 feet of an historic structure, Stanford shall develop a Vibration Reduction Plan in coordination with an acoustical consultant, geotechnical engineer, and/or construction contractor, for review and approval by the County Planning and Development Department. Measures and controls shall be identified based on project-specific final design plans, and may include, but are not limited to, either or both of the following: 1. Use non-vibratory excavator-mounted compaction wheels and small smooth drum rollers for final compaction of asphalt base and asphalt concrete. If needed to meet compaction	Less than Significant

[2] Consistent with noise criteria used by FTA for construction activities in vicinity of residential land uses (FTA, 2008)

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Noise and Vibration (cont.)		
Impact 5.11-3 (cont.)	requirements, smaller vibratory rollers will be used to minimize vibration levels during repaving activities where needed to meet vibration standards. 2. Implementation of buffers and the use of specific types of equipment to minimize vibration impacts during construction at nearby receptors in order to meet a performance standard of 0.12 inches per second PPV at historic buildings and 0.3 inches per second PPV at non-historic buildings. 3. Implementation of a vibration, crack, and line and grade monitoring program for identified historic buildings located within 40 feet of construction activities, in coordination with a geotechnical engineer and qualified architectural historian.	
Impact 5.11-4: The Project could increase long-term noise levels in the Project vicinity to levels in excess of applicable noise standards. (*Significant*)	**Mitigation Measure 5.11-4:** *Shield or Enclose HVAC Equipment and Emergency Generators.* Noise levels from mechanical equipment within 150 feet of sensitive receptors shall be minimized by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment achieves the following noise standards at the property line of an offsite sensitive land uses in Palo Alto or Menlo Park, or at the nearest on-site residential, day care or instructional classroom land use: • The project shall not cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB; • The project shall not cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB; • The project shall not cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB. Noise levels from the periodic testing of emergency generators within 150 feet of sensitive receptors in the cities of Palo Alto or Menlo Park also shall be minimized by proper siting and through installation of acoustical shielding. Scheduled testing of an emergency generator must not occur before 7:00 a.m. or after 7:00 p.m.	Less than Significant
Impact 5.11-5: Project traffic would not substantially increase traffic noise levels in the vicinity of the Project site. (*Less than Significant*)	None required.	Less than Significant
Impact 5.11-6: Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to cumulative noise impacts. (*Significant*)	**Mitigation:** Implement Mitigation Measure 5.11-1**,** *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors,* and Mitigation Measure 5.11-2, *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*	Significant and Unavoidable
Impact 5.11-7: Project traffic in combination with traffic from cumulative development would not contribute considerably to cumulative noise impacts. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Population and Housing		
Impact 5.12-1: The proposed Project would not directly induce substantial population growth by proposing new homes or businesses, and indirectly through the extension of infrastructure. (*Less than Significant*)	None required.	Less than Significant
Impact 5.12-2: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative population and housing impacts. (*Less than Significant*)	None required.	Less than Significant
Public Services		
Impact 5.13-1: Project construction could increase demand for fire protection, emergency medical service and police protection services but would not result in an adverse physical impact from the construction of additional fire protection, emergency medical, or police protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)	None required.	Less than Significant
Impact 5.13-2: Operation of uses under the Project would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)	None required.	Less than Significant
Impact 5.13-3: Operation of development under the proposed Project would increase demand for police protection services. (*Less than Significant*)	None required.	Less than Significant
Impact 5.13-4: The proposed Project would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)	None required.	Less than Significant
Impact 5.13-5: Implementation of the proposed Project in combination with past, present, and reasonably foreseeable projects, would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Public Services (cont.)		
Impact 5.13-6: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)	None required.	Less than Significant
Impact 5.13-7: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)	None required.	Less than Significant
Recreation		
Impact 5.14-1: The Project would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Less than Significant*)	None required. **Improvement Measure 5.14-1:** Stanford has proposed to provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs previously identified by the City of Palo Alto (approximately $300,000) to provide for planned park upgrades and ensure that the four College Terrace parks remain in good condition. These improvements identified in the Palo Alto Capital Budget were as follows: • Tennis court upgrade ($215,000 planned for both Terman Park and Weisshaar Park, this good-neighbor offer assumes $140,000 is for Weisshaar Park), planned for FY 2021. • Planned infrastructure improvements to upgrade and renovate safety and accessibility of the playground and other features in Cameron Park, approximately $160,000, planned for FY 2020.	
Impact 5.14-2: The construction of recreational facilities under the proposed Project would cause physical effects on the environment. (*Significant*)	Implement the following mitigation measures, as needed for construction of recreation facilities: ***Air Quality*** Mitigation Measure 5.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.* Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.* ***Biological Resources*** Mitigation Measure 5.3-1(a)-(e): *Mitigation for nesting birds during construction.* Mitigation Measure 5.3-2(a)-(d): *Mitigation for special-status bat species during construction.*	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Recreation		
Impact 5.14-2 (cont.)	Mitigation Measure 5.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.* Mitigation Measure 5.3-4(a)-(b): *Mitigation for special-status plant species during construction.* Mitigation Measure 5.3-6(a)-(c): *Mitigation for steelhead during construction.* Mitigation Measure 5.3-7(a)-(b): *Mitigation for riparian habitat during construction.* Mitigation Measure 5.3-8(a)-(b): *Mitigation for native oak woodland during construction.* Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands during construction.* Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees during construction.* ***Hazardous Materials*** Mitigation Measure 5.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.* ***Hydrology and Water Quality*** Mitigation Measure 5.9-1: *Review historic wells survey.* ***Noise and Vibration*** Mitigation Measure 5.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* Mitigation Measure 5.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* Mitigation Measure 5.11-3: *Construction Vibration Reduction Plan.* ***Transportation and Traffic*** Mitigation Measure 5.15-1: *Construction Traffic Control Measures.*	
Impact 5.14-3: The Project in combination with past, present, and reasonably foreseeable future projects would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic		
Impact 5.15-1: The proposed Project would generate construction traffic that would cause a substantial reduction in mobility and in access to land uses. (*Significant*)	**Mitigation Measure 5.15-1:** *Construction Traffic Control Measures.* The following traffic control measures are required to address impacts from construction of individual 2018 General Use Permit projects. • ***Protection and Maintenance of Public Transit Access and Routes***. Stanford and its contractors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, during project construction without prior approval from the VTA and other affected jurisdictions. Such approvals shall require submittal and advance coordination per VTA's Bus Stop Relocation Policy of a mitigation plan to reduce transit impacts to a less than significant level. Potential actions that would impact access to transit include, but are not limited to, relocating or removing public transit bus stops, limiting access to public transit bus stops or transfer facilities, or otherwise restricting or constraining public transit operations. • ***Maintenance of Pedestrian Access***. Stanford and its contractors shall be prohibited from substantially limiting pedestrian access to properties or facilities during construction of the project, without prior approval from the affected jurisdictions. Such approvals shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting pedestrian access include, but are not limited to, sidewalk closures, bridge closures, crosswalk closures, pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided if determined by the County to be needed for pedestrian safety. • ***Maintenance of Bicycle Access***. Stanford and its contractors shall be prohibited from substantially limiting bicycle access to properties or facilities during construction of the project, without prior approval from those jurisdictions. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting bicycle access include, but are not limited to, bike lane closures or narrowing, closing or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists. • ***Protection and Maintenance of Emergency Service Access and Routes***. Stanford shall inform the Stanford Police and Palo Alto Police and Fire Departments of construction locations, and shall designate alternate evacuation and emergency routes to maintain response times during construction periods. • ***Parking for Construction-Related Vehicles***. Stanford shall provide adequate on-campus parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the Stanford campus, a satellite parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to/from the job site.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-1 (cont.)	• ***Restriction on Construction Delivery Hours***. Stanford shall make feasible attempts to avoid construction material deliveries from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM on weekdays. When feasible, Stanford shall be required to prohibit or limit the number of construction employees arriving or departing the site between 4:30 PM and 6:00 PM. • ***Construction Truck Routes***. Stanford shall deliver and remove all construction-related equipment and materials on truck routes designated by the Cities of Palo Alto and Menlo Park and, in the event the County of San Mateo designates truck routes, by the County of San Mateo. Heavy construction vehicles shall be prohibited from accessing the site from routes that the Cities of Palo Alto, Menlo Park or County of San Mateo have prohibited for use by such vehicles. Stanford shall provide written notification to all contractors regarding appropriate routes to and from construction sites and the weight and speed limits for local roads used to access construction sites. A copy of all such written notifications shall be submitted to the County Planning Office. • ***Phone Number for Complaints***. Stanford shall post at least one sign no smaller than 1,296 square inches at all active construction sites. The sign shall contain the name, telephone number and e-mail address of the appropriate Stanford person the public may contact to report alleged violations of this mitigation measure or to register complaints about construction traffic associated with building projects under the 2018 General Use Permit. Stanford shall keep a written record of all such complaints and shall provide copies of these records to the County Planning Office as part of the annual report process. • ***Construction Impact Mitigation Plan***. In lieu of the above mitigation measures, Stanford may submit a detailed construction impact mitigation plan to the County for review and approval prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. If Stanford determines that it is not feasible to comply with the "Restriction on Construction Delivery Hours" above, then the plan shall also explain the basis for this infeasibility determination. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved. • ***Construction During Special Events***. Stanford shall prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be obtained to host such events during significant construction phases.	
Impact 5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions. (*Significant*)	**Mitigation Measure 5.15-2(a):** Stanford shall mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of fair share fees for the improvements for adversely affected intersections specified in Table 1 [minus the contribution to these improvements provided pursuant to Mitigation Measure 5.15-2(b), below], which funds shall be expended by the County to fund mitigation efforts.	Significant and Unavoidable

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-2 (cont.)	1. As specified on page 64 and Policy C-1 of the Stanford Community Plan, the no net new commute trips standard is defined as no increase in automobile trips during peak commute times in the peak commute direction, as counted at defined cordon locations around the central campus. The peak commute period is defined as the one-hour period in the morning (AM) and afternoon (PM) with the highest volume of traffic at the cordon locations, as determined by traffic counts. 2. The reasonable cost of all traffic counts and other work conducted for determination of compliance with this mitigation measure shall be paid for by Stanford. The counts shall be performed by an independent consultant under the direction of the County Planning Office or provided to the County Planning Office through another County-approved methodology. 3. The baseline for measuring the no net new commute trips standard shall be the count that was established in 2001. However, during implementation of the 2018 General Use Permit, the County may modify, or approve Stanford-proposed modifications to the monitoring methodology on new technology such as automation, so long as the basic principles underlying the no net new commute trips standard are still met. If the monitoring methodology is updated, testing and calibration of the new methodology or equipment will require coordination with the County. The County may adjust the 2001 baseline as needed to reflect any such calibration. Monitoring counts shall be performed each year using the County-approved methodology. 4. Traffic counts and determination of traffic volumes shall occur as described below, unless modifications are approved by the County Planning Office. a. Peak-hour traffic for a single year shall be determined through counts taken at two times during the year. All counts shall be conducted during the regular academic year, which does not include academic breaks or end-of-quarter finals. Homecoming or other irregular traffic patterns should be avoided. Specific dates for each count shall be determined by the County Planning Office. The two annual counts shall be averaged to determine the annual traffic level for each monitoring year. i. During monitoring periods, the total amount of traffic crossing the cordon line will be counted by travel direction. The cordon count monitoring will be conducted on a 24-hour basis. The morning (AM) and afternoon (PM) peak hours within the 24-hour count period will be calculated based on total volumes to determine the campus-wide peak hours. ii. All counts shall be taken at the campus entry and exit points shown in Figure 5.15-2, which together form the defined cordon line. Additional cordon gateways may be added or the location of the cordon line may be modified as determined by the County. a) Traffic counts shall include a methodology to determine the rate of cut-through traffic. 1) Cut-through trips will be identified through license plates on each vehicle or other means. Entry and exit times will be noted to determine when a vehicle crosses the cordon in either direction.	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-2 (cont.)	2) Matching license plates will be determined by comparing numbers that crossed both an entering and exiting cordon within a defined period (i.e., 20 minutes or as updated), or through other means. Vehicles that enter and exit the cordon within the time period will be cut-through trips across the campus without a campus-related purpose. If data are available or it is feasible to measure, the County will include in the cordon counts all rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs. b) Cordon volumes will be adjusted to account for use of parking lots within the cordon line by hospital-related traffic and use of lots outside the cordon line by campus-related traffic. Parking areas change due to the evolving needs of campus and hospital operations. The lots used for hospital and university parking shall be confirmed prior to annual surveys. The County reserves the right to change the methodology related to hospital parking or other parking factors in response to changing conditions. 1) Hospital trips will be subtracted from the count and campus trips will be added to the count. The count adjustment will also factor in the potential for hospital trips to park in the campus lots and campus trips to park in the hospital lots. At the beginning and end of the peak hours, data will need to be collected from each lot. If campus parking occurs in lots outside the cordon, trips associated with those vehicles will be added back into the count. If hospital parking occurs inside the cordon, trips associated with those vehicles will be subtracted from the count. All vehicles without a parking permit will be assumed to be correctly parked in their respective lots, unless the County approves an alternate protocol for assigning such parking. c) Based on the 24-hour counts, the AM and PM peak hours will be identified for the campus. Peak hour traffic volume will be determined for the campus based on the count, adjusted for cut-through traffic and hospital parking as described above. 1) Total entering and exiting traffic will be summed for the 16 campus gateways. A single AM and PM peak hour will be determined for the entire campus based on the peak inbound traffic in the AM period and the peak outbound traffic in the PM period. The percent of cut-through trips calculated by the license plate matching (or other technology) described above will be removed. With the exception of rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs, the cut-through vehicles will be removed from both the inbound and the outbound traffic since they will have been observed crossing both an entering and exiting cordon boundary. Finally, the entering and exiting traffic for	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-2 (cont.)	hospital uses inside the cordon boundary and the campus uses outside the cordon boundary calculated as described above will be subtracted from or added to the counts. 5. As specified by Community Plan Policy C-8, the County Planning Office will recognize participation by Stanford in off-campus trip reduction efforts and credit those reduced trips towards Stanford's attainment of the no net new commute trips standard. Stanford shall receive credit commensurate with the actual number of trips reduced outside the cordon due to Stanford's direct efforts, or the proportion of the cost of the program to which Stanford is contributing. A reduction of an off-campus trip may be recognized as long as at least one terminus for the trip is within the area shown on **Figure 5.15-8**. The County Planning Office will determine the appropriate trip credit and monitoring methodology for each program in which Stanford proposes to participate. Such proposals shall be submitted by Stanford to the County Planning Office for review, modification and potential approval. The proposals shall be presented to the Community Resource Group prior to any determination by the County Planning Office. Once the County Planning Office has accepted the proposal and the program implementation begins, the County Planning Office will identify, at Stanford's cost, the number of trips reduced outside the cordon and calculate a trip reduction credit for application toward attainment of the no net new commute trips standard, with the continuing requirement that Stanford provide evidence of its participation in the ongoing program in a manner that can be independently verified. The County reserves the right to further regulate Project-generated trips and the use of trip credits through the Conditions of Approval for the General Use Permit. Funding of off-campus circulation infrastructure improvements may also qualify for trip credits if the improvements will enhance safety or increase mobility for pedestrians, bicyclists or transit users within the local impact area, and thereby remove vehicular trips from the local impact area. For example, funding roadway widening or modifications to add transit vehicle or bicycle lanes or to add signals to improve pedestrian or bicycle safety could qualify for trip credits under this approach if approved by the County. Any proposal for such credits shall be accompanied by substantial evidence demonstrating that the infrastructure project would remove vehicular trips from the local impact area. Once the County Planning Office has approved infrastructure improvement project for a trip reduction credit, the project has been implemented, and the trip reductions have been verified, the trip reduction credit will be factored into the County's conclusion regarding Stanford's annual compliance with the no net new commute trips standard in each subsequent year. Each year, the County will report Stanford's trip credits in its annual monitoring report. The County will track and calculate trip reduction credits in a manner designed to ensure that credits benefit the three geographic sub-areas surrounding the Stanford campus (north, east, and south/southwest) in rough proportion to the 2018 General Use Permit trip assignment forecasted in the Draft EIR. Trip reduction credits with area-wide benefit will be tracked separately from trip reduction credits with sub-area geographic benefits.	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-2 (cont.)	6. The County Planning Office shall monitor the cordon counts using the procedures described above. If the cordon counts, as modified by trip reduction credits, exceed the baseline volume by 1% or more for any two out of three consecutive years, mitigation of impacts to intersections in the form of fair share payments will be required, implementing Stanford Community Plan Implementation Recommendation C(i)(9). Table 1 identifies the intersection impacts that could occur if the no net new commute trips standard is not achieved, and the physical improvements that would substantially reduce each impact. Upon the County's determination that the no net new commute trips standard has been exceeded by 1% or more in two out of three consecutive years, the County will require Stanford to make its fair share contribution toward improvements at adversely affected intersections and roadways based on all exceedances of the "no net new commute trips" standards. The County Planning Office will use the intersection improvement fees collected from Stanford as follows: a. The fees shall be used to fund the intersection improvements identified in Table 1. The priority order for funding such intersection improvements will be determined by the County Planning Office in consultation with the affected jurisdictions. If the fees are used to fund an intersection improvement in another jurisdiction, the County will enter into an agreement with such jurisdiction to address the timing for the County to provide the funding, the timing for the relevant jurisdiction to complete the improvement, and any other matters that the County determines to be appropriate. b. Substitute Mitigation: If the County Planning Office determines that it is not feasible to use the fees for the specified intersection improvements (e.g., it does not appear that there will be full funding for the improvements within a reasonable time; the public agencies with authority or jurisdiction over the improvement projects will not approve the projects), then the fees may be used to fund off-campus projects that encourage and improve the use of alternative transportation modes or otherwise reduce peak period traffic in the local impact area, including but not limited to transit improvements that would directly or indirectly benefit the local impact area. This fund also could be used for transportation improvements that increase safety and mobility for pedestrians, bicyclists and transit users provided there is substantial evidence demonstrating how the improvements would remove vehicular trips from the local impact area. **Mitigation Measure 5.15-2(b):** Stanford shall mitigate the transportation impacts of its additional development and population growth with respect to reverse-commute impacts through the contribution of fair share fees for the cost of improvements for adversely affected intersections specified in Table 2 (a subset of the adversely affected intersections specified in Table 1), which funds shall be expended by the County to fund transportation mitigation efforts in the same manner as provided in Mitigation Measure 5.15-2(a)(6)(a) and (b).	

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions. (*Significant*)	**Mitigation:** Implement Mitigation Measure 5.15-2(a).	Significant and Unavoidable
Impact 5.15-4: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-5: Implementation of the proposed Project would not substantially increase intrusion by traffic in nearby neighborhoods. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-6: Implementation of the proposed Project would not substantially increase hazards due to a design feature or incompatible uses. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-7: Implementation of the proposed Project would not result in inadequate emergency access. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-8: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions. (*Significant*)	**Mitigation:** Implement Mitigation Measure 5.15-2(a)-(b).	Significant and Unavoidable
Impact 5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions. (*Significant*	**Mitigation:** Implement Mitigation Measure 5.15-2(a).	Significant and Unavoidable
Impact 5.15-11: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future, projects, would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Transportation and Traffic (cont.)		
Impact 5.15-12: The Project would be located within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor. (*Less than Significant*)	None required.	Less than Significant
Impact 5.15-13: The proposed Project VMT would not exceed the numeric thresholds recommended by OPR. (*Less than Significant*)	None required.	Less than Significant
Utilities and Service Systems		
Impact 5.16-1: The Project would result in the expansion of existing on-campus infrastructure, the construction of which could cause significant environmental effects. (*Significant*)	**Mitigation:** Implement the following mitigation measures, as needed for construction of infrastructure improvements: ***Air Quality*** Mitigation Measure 5.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.* Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.* ***Biological Resources*** Mitigation Measure 5.3-1(a)-(e): *Mitigation for nesting birds during construction.* Mitigation Measure 5.3-2(a)-(d): *Mitigation for special-status bat species during construction.* Mitigation Measure 5.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.* Mitigation Measure 5.3-4(a)-(b): *Mitigation for special-status plant species during construction.* Mitigation Measure 5.3-6(a)-(c): *Mitigation for steelhead during construction.* Mitigation Measure 5.3-7(a)-(b): *Mitigation for riparian habitat during construction.* Mitigation Measure 5.3-8(a)-(b): *Mitigation for native oak woodland during construction.* Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands during construction.* Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees during construction.* ***Hazardous Materials*** Mitigation Measure 5.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Utilities and Service Systems (cont.)		
Impact 5.16-1 (cont.)	***Hydrology and Water Quality*** Mitigation Measure 5.9-1: *Review historic wells survey.* ***Noise and Vibration*** Mitigation Measure 5.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* Mitigation Measure 5.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* Mitigation Measure 5.11-3: *Construction Vibration Reduction Plan.* ***Transportation and Traffic*** Mitigation Measure 5.15-1: *Construction Traffic Control Measures.*	
Impact 5.16-2: Project development would increase the demand for water, however it would be adequately supplied from existing entitlements and resources. (*Less than Significant*)	None required.	Less than Significant
Impact 5.16-3: The Project would increase demand for wastewater treatment, but would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (*Less than Significant*)	None required.	Less than Significant
Impact 5.16-4: The Project would discharge additional flows to the municipal sewer and drainage system, but not to an extent which would exceed the facilities' capacity in light of existing commitments. (*Less than Significant*)	None required.	Less than Significant
Impact 5.16-5: Project construction would result in an increased generation of solid waste, but would not exceed permitted capacity to accommodate the Project's solid waste disposal needs or conflict with federal, State, and local statutes and regulations related to solid waste. *(Less than Significant*)	None required.	Less than Significant
Impact 5.16-6: Operation of the Project would comply with federal, state, and local statutes and regulations related to solid waste and would be adequately served by existing landfills with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (*Less than Significant*)	None required.	Less than Significant
Impact 5.16-7: Implementation of the proposed Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for water supplies. (*Less than Significant*)	None required.	Less than Significant

TABLE 1-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Utilities and Service Systems (cont.)		
Impact 5.16-8: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for wastewater treatment. (*Less than Significant*)	None required.	Less than Significant
Impact 5.16-9: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for landfill space. (*Less than Significant*)	None required.	Less than Significant
Environmental Consequences of Stanford Providing Off-campus Housing under Proposed Project		
Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts. *(Significant)*	**Mitigation Measure 5.17-1:** The local governmental agencies in which off-campus housing would be located can and should mitigate the environmental impacts from off-campus housing to the extent feasible.	Significant and Unavoidable

CHAPTER 2
Introduction

2.1 Purpose of This EIR

Stanford University (Stanford) has applied for a new General Use Permit governing development on its lands in unincorporated Santa Clara County. The proposed General Use Permit would authorize an additional increment of campus growth and land use development, anticipated to take place over a period that would extend from approximately 2018 through 2035. Stanford seeks County approval of the proposed General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map. For ease of reference, all of these approvals are collectively referred to as the "2018 General Use Permit" or the "Project" in this EIR.

The County of Santa Clara, as lead agency responsible for the environmental review for private development projects in unincorporated Santa Clara County, has determined that, under the California Environmental Quality Act (CEQA), an environmental impact report (EIR) is required for the proposed Project. CEQA requires the preparation of an EIR when a proposed project could result in significant, adverse effects on the physical environment. This EIR has been prepared in compliance with CEQA (California Public Resources Code (PRC), Section 21000 *et seq.*) and the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15000 *et seq.*). The EIR is an informational document for use by governmental agencies and the public to aid in the planning and decision-making process by disclosing the physical environmental effects of the proposed project, and identifying possible ways of reducing or avoiding its potentially significant impacts.

CEQA requires that, before a decision can be made to approve a project that could result in potential adverse physical effects, an EIR must be prepared that describes the probable environmental effects of the project. The EIR is a public information document which identifies and evaluates potential environmental impacts of a project, recommends mitigation measures to lessen or eliminate significant adverse impacts, and examines feasible alternatives that could achieve the basic objectives of the project while reducing or eliminating one or more significant effects of the project. The information contained in the EIR must be reviewed and considered by the County of Santa Clara and by any Responsible Agencies (as defined in CEQA) prior to a decision to approve the proposed project.

The CEQA Guidelines define the role and content of an EIR as follows:

- **Informational Document.** An EIR is an informational document that is required to inform public agency decision-makers and the public of the significant environmental effect(s) of a project, identify possible ways to minimize the significant effects, and

describe reasonable alternatives to the project. The public agency is required to consider the information in the EIR along with other information that may be presented to the agency (See CEQA Guidelines, Section 15121(a)).

- **Standards for Adequacy of an EIR.** An EIR is required to be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make an informed decision that takes account of the probable environmental consequences of implementation of the project. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is required to be reviewed in light of what is reasonably feasible. It is recognized that there may be disagreement among experts, and under CEQA such disagreement does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (See CEQA Guidelines, Section 15151).

The CEQA Guidelines, Section 15382, define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…." Therefore, in identifying the significant impacts of the proposed Project, this EIR describes the potential for the Project to result in substantial physical effects and identifies potentially feasible measures that would avoid, reduce, or otherwise mitigate those effects. See Chapter 5, Section 5.0, Introduction to Environmental Analysis, for further description of the approach to analyzing environmental impacts and identifying mitigation measures presented in this EIR.

2.2 CEQA Environmental Review

The proposed 2018 General Use Permit is intended to guide the development of a variety of academic-related uses from approximately 2018 through 2035. Accordingly, the County has prepared a Program EIR pursuant to CEQA Guidelines Section 15168. A Program EIR is appropriate for a series of actions that can be characterized as one large project and are either: (1) related geographically, (2) logical parts in a chain of contemplated actions, (3) connected as part of a continuing program, or (4) carried out under the same authorizing statute or regulatory authority and have similar environmental impacts that can be mitigated in similar ways (CEQA Guidelines Section 15168).

CEQA Guidelines Section 15168 notes that the use of a Program EIR ensures consideration of cumulative impacts that might be slighted in a case-by-case analysis; avoids duplicative reconsideration of basic policy considerations; allows the lead agency to consider broad policy alternatives and program-wide mitigation measures at an early time, when the agency has greater flexibility to deal with basic problems or cumulative impacts; and allows for a reduction in paperwork.

Project-specific CEQA review may be required for individual buildings or other projects that would be developed pursuant to the proposed 2018 General Use Permit. Prior to consideration of approval, the County would examine each individual development at the time they are proposed to determine whether the environmental effects of the specific project were disclosed in the 2018

General Use Permit EIR. For further discussion of Subsequent Project Approvals, see Section 2.3.5, below.

2.3 CEQA Process

Consistent with CEQA Guidelines Sections 15080 to 15097, the CEQA process has multiple phases, many of which require notification to and opportunity for comments from the public. The main steps in this process are described below.

2.3.1 Notice of Preparation and Public Scoping

On January 10, 2017, the County of Santa Clara sent a Notice of Preparation (NOP) to governmental agencies, organizations, and persons interested in the proposed Project to initiate the public scoping period for this EIR, which ended on February 17, 2017).[1] The NOP is included in Appendix NOP of this EIR. The NOP notified and informed agencies and interested parties about the proposed Project, and the County of Santa Clara's decision to prepare an EIR; it included a request for agencies and the public to comment on environmental issues that should be addressed in the EIR. The County of Santa Clara also held a public scoping meeting on February 8, 2017 at the Palo Alto Arts Center Auditorium, 1313 Newell Road, Palo Alto to receive oral comments on the scope of the EIR. The comments received in response to the NOP, both written and oral, are included in Appendix NOP Responses. The County of Santa Clara has considered all substantive comments made by the public and agencies in preparing the Draft EIR for the proposed Project. See Section 2.5 below for a summary of relevant scoping comments received during the public scoping period.

The scope of this EIR includes environmental issues that have the potential to be significant impacts, as determined through preparation of the NOP, responses to the NOP, scoping meeting, and discussions among the public, consulting staff, other agencies, and the County of Santa Clara. This process identified potentially significant impacts associated with the construction and/or operation of the proposed Project in the following issue areas:

- Visual and Scenic Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy Conservation
- Geology and Soils
- Greenhouse Gases
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise and Vibration
- Population and Housing
- Public Services (Police Protection, Fire Protection and Emergency Services, and Public Schools)
- Recreation
- Transportation and Traffic
- Utilities and Service Systems (Water Supply, Wastewater Collection and Treatment, and Solid Waste Disposal)

[1] It should be noted certain public agencies requested and were granted an extension to the deadline, including the City of Palo Alto, City of Menlo Park, and the Palo Alto Unified School District.

This EIR evaluates the direct, indirect, and cumulative impacts that could result from construction and operation of the proposed Project in these issue areas in accordance with CEQA.

2.3.2 Draft EIR Public Review

This Draft EIR is being circulated to governmental agencies and to interested organizations and individuals that may wish to review and comment on the document. CEQA Guidelines sections 15086(c) and 15096(d) require Responsible Agencies or other public agencies to provide comment on those project activities within the agency's area of expertise or project activities that are required to be carried out or approved by the agency, and the agency should support those comments with either oral or written documentation. Publication of the Draft EIR initiates a 60-day public review period, during which time the County of Santa Clara will accept comments on the Draft EIR. The public review period for the Draft EIR for the proposed 2018 Stanford General Use Permit is from October 6 through December 4, 2017.

Copies of the Draft EIR and documents referenced in the Draft EIR are available for public review at the following locations: (1) County of Santa Clara Planning Office, County Government Center, 70 West Hedding, 7th Floor, East Wing, San Jose, California; (2) Mitchell Park Library, 3700 Middlefield Rd, Palo Alto; and (3) Rinconada Library, 1213 Newell Rd, Palo Alto. The Draft EIR is also available on the County of Santa Clara's website at www.sccgov.org/sites/dpd/Programs/Stanford/Pages/GUP2018_CEQA.aspx.

Written comments on the Draft EIR should be sent by mail to: Mr. David Rader, Senior Planner, County of Santa Clara Planning Office, County Government Center, 70 West Hedding, 7th Floor, East Wing, San Jose, California; or by email to: david.rader@pln.sccgov.org.

During the public review period for the Draft EIR, the County of Santa Clara will conduct two public meetings:

- **October 12 (Thursday) from 7:00-9:00 p.m.** at Lucie Stern Community Center Ballroom, 1305 Middlefield Road, Palo Alto (Presentation by County Staff of Draft EIR and public comment process.)

- **November 30 (Thursday) from 7:00 -9:00 p.m.** at Palo Alto Arts Center Auditorium, 1313 Newell Road, Palo Alto (Special County Planning Commission meeting to receive public comments on the Draft EIR.)

Information on these meetings is available on the County Planning's website at: www.sccgov.org/sites/dpd/Programs/Stanford/Pages/GUP2018_CEQA.aspx

2.3.3 Responses to Comments Document and Final EIR

Following the close of the public review period on the Draft EIR, the County of Santa Clara will prepare a Response to Comments document that addresses all substantive written and oral comments received on the Draft EIR, and any other revisions to the Draft EIR initiated by County staff. The Response to Comments document together with the Draft EIR will constitute the

Final EIR. The County of Santa Clara Board of Supervisors will hold a public hearing to consider the adequacy of the Final EIR in complying with the requirements of CEQA.

The County of Santa Clara Board of Supervisors must certify the Final EIR before making a decision to approve the Project. Prior to approval of a project for which the EIR identifies significant environmental effects, CEQA requires the adoption of Findings of Fact (CEQA Guidelines, Sections 15091 and 15092). If the Final EIR identifies significant adverse impacts that cannot be mitigated to less-than-significant levels, the findings must include a statement of overriding considerations for those impacts (CEQA Guidelines, Section 15093(b)). See Chapter 5 for a description of impact significance determinations.

2.3.4 Mitigation Monitoring and Reporting Program

Throughout this EIR, mitigation measures have been described in language that will facilitate establishment of a Mitigation Monitoring and Reporting Program (MMRP). As required under CEQA (see CEQA Guidelines, Section 15097), an MMRP will be prepared and presented to the County of Santa Clara Board of Supervisors at the time of certification of the Final EIR for the proposed Project and will identify the specific timing and roles and responsibilities for implementation of adopted mitigation measures.

2.3.5 Subsequent Project Approvals

This EIR discloses the environmental effects of construction and operation of the proposed 2018 General Use Permit pursuant to the requirements of the CEQA Guidelines, as described in Chapter 3, Project Description. As described in Chapter 3, the proposed Project includes approval of the proposed 2018 General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map.

Subsequent development activities undertaken pursuant to the General Use Permit must be consistent with the requirements of these approvals, as well as the adopted MMRP, and will require project-specific County approvals that may include, but are not limited to, Architecture and Site Approval, Grading Approval, grading permits, and/or building permits for specific development and infrastructure projects consistent with the 2018 General Use Permit.

Use of this EIR to cover later project activities is addressed in PRC section 21166 and CEQA Guidelines Sections 15168 and 15162(a). Under those sections, if the proposed future activities would not create new or substantially more severe significant impacts than those examined in this EIR, the later activities are considered to be within the scope of the EIR and no further review under CEQA is required. More specifically, CEQA Guidelines Section 15162(a) states:

> When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
>
> (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant

environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Thus, to the extent appropriate and consistent with the requirements of CEQA and the CEQA Guidelines, the County would rely on this EIR in conjunction with its consideration of subsequent projects undertaken pursuant to the proposed 2018 General Use Permit.

2.4 Public Participation

The CEQA Guidelines encourage public participation in the planning and environmental review processes. As part of the CEQA process, the County of Santa Clara provides formal opportunities for the public to present comments and concerns regarding the planning and environmental review process as follows: (1) during the public scoping period after publication of the NOP, (2) during the Draft EIR public review period, and (3) at a public hearing before the County of Santa Clara Board of Supervisors after publication of the Responses to Comments Document, when the Board of Supervisors is considering certification of the Final EIR. Written public comments may be submitted to the County of Santa Clara Planning Office during the specified public review and comment periods, and both written and oral comments may be presented at public hearings held specifically for the proposed 2018 General Use Permit. This CEQA public participation process is separate from any public meetings conducted by Stanford or other entities.

2.5 Summary of Scoping Comments

As described above, the NOP for the 2018 General Use Permit EIR was issued on January 10, 2017. The public comment period related to the NOP ended on February 17, 2017, and included a public scoping meeting held on February 8, 2017. The NOP is in Appendix NOP, and the oral and written comments received in response to the NOP are in Appendix SCO.

It should be noted that a number of scoping comments were received that were either related to the merits of the Project or other issues outside of the scope of the CEQA analysis. See also Chapter 1, Summary for a discussion of issues of concern, some of which were raised during the public scoping period.

2.6 Contents and Organization of the EIR

This EIR describes the proposed Project and required approvals, analyzes potential environmental impacts of the proposed Project, identifies mitigation measures where those impacts are significant, identifies cumulative adverse impacts to which the proposed Project could make a substantial contribution, and evaluates alternatives to the Project that could avoid or reduce significant impacts while still meeting most of the Project's objectives.

This EIR is organized as follows:

- **Chapter 1, Summary.** This chapter summarizes the Project and the conclusions of the Draft EIR. A summary table is included providing a summary of the environmental impacts that would result from the Project, mitigation measures identified to reduce or avoid significant impacts, and any residual environmental impacts after implementation of mitigation measures. A summary of the Project alternatives and the environmentally superior alternative is also provided. The executive summary also identifies areas of controversy regarding the Project that are known to the County.

- **Chapter 2, Introduction.** This chapter discusses the purpose of the EIR, describes the environmental review process, provides a summary of the public and agency comments received on the scope of the EIR, and discusses the organization of the EIR.

- **Chapter 3, Project Description.** This chapter includes a statement of objectives from the Project applicant, a description of the Project location and site characteristics; a discussion of existing County regulation of the Project site; a description of the proposed 2018 General Use Permit and related actions, and a list of required Project approvals.

- **Chapter 4, Plan Consistency.** This chapter provides a summary of any inconsistencies between the proposed Project and applicable general plans and regional plans.

- **Chapter 5, Environmental Setting, Impacts and Mitigation Measures.** This chapter provides an introduction to the environmental analysis, describes the Project's environmental setting, regulatory setting, methodology used, and impact analyses of both Project-specific and cumulative impacts of the proposed Project and a determination of the significance of each impact. For impacts determined to be significant, mitigation measures that would reduce or avoid those impacts are presented.

- **Chapter 6, Other CEQA Issues.** This chapter summarizes significant and unavoidable impacts, significant irreversible environmental changes, and any growth-inducing effects.

- **Chapter 7, Alternatives.** This chapter presents and evaluates feasible alternatives to the proposed Project that could attain most of the Project's objectives as well as avoid or reduce one or more of the identified significant adverse impacts of the Project. It also identifies the environmentally superior alternative and describes other alternatives that were considered but rejected.

- **Chapter 8, Special Considerations.** This chapter describes Stanford's proposed funding of a number of off-site bicycle facility improvements. The chapter describes the relationship of these proposed improvements to the Project, a description of the physical improvements, and environmental considerations associated with the construction and operation of these improvements.

- **Chapter 9, Report Preparers.** This chapter identifies the EIR authors and consultants; Project applicant and consultants; and agencies and persons consulted during preparation of the Draft EIR.

- **Appendices.** The appendices include the NOP, written and oral responses to the NOP, and various supporting technical information for the Draft EIR.

CHAPTER 3
Project Description

3.1 Project Overview

Stanford University (Stanford) has applied for a new General Use Permit governing development on its lands in unincorporated Santa Clara County. The proposed General Use Permit would authorize an additional increment of campus growth and land use development, including 2,275,000 net new square feet of net new academic and academic support facilities, and 3,150 net new housing units/beds, anticipated to take place over a period that would extend from approximately 2018 through 2035. The proposed General Use Permit would apply only to those Stanford lands that are located within unincorporated Santa Clara County, and thus, are subject to the land use jurisdiction and regulatory authority of the County of Santa Clara. Stanford seeks County approval of the proposed General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map. For ease of reference, all of these approvals are collectively referred to as the "2018 General Use Permit" or the "Project" in this EIR. The proposed 2018 General Use Permit is subject to review under the California Environmental Quality Act (CEQA). The County of Santa Clara is serving as the Lead Agency under CEQA for the proposed 2018 General Use Permit. The County has prepared a Program EIR for the proposed 2018 General Use Permit pursuant to CEQA Guidelines Section 15168.

3.2 Project Objectives

Section 15124(b) of the CEQA Guidelines requires that the Project Description of an EIR contain a statement of objectives for the proposed project. Stanford's objective is County approval of a 2018 General Use Permit that would authorize continued growth and development on the campus[1] in a manner that implements the Stanford Community Plan's policies and that is consistent with the growth assumptions in the approved Sustainable Development Study.[2] Stanford's more specific objectives are as follows:

[1] For purposes of this EIR, the term "campus" generally refers to all Stanford lands located within unincorporated Santa Clara County (see Section 3.3, Site Location, below). It should be noted, however, that within the campus, Stanford also describes a "central campus," generally located east of Junipero Serra Boulevard in which its academic facilities and housing are concentrated (see Section 3.4, Site Characteristics).

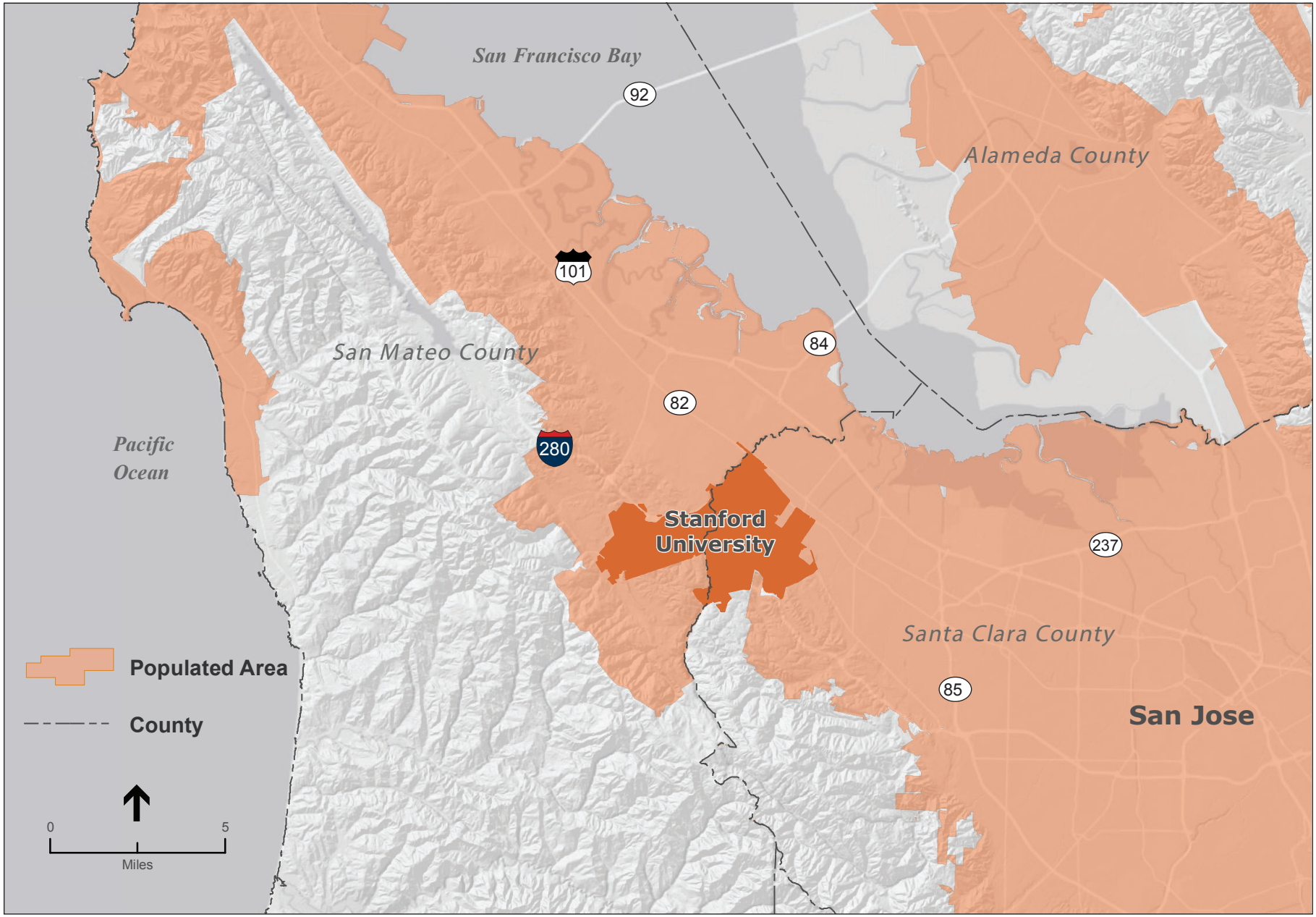
[2] Stanford's Sustainable Development Study (SDS) was approved in 2009 in accordance with the Stanford Community Plan and the Stanford 2000 General Use Permit (both described in Section 3.6, Existing County Regulation of Stanford Lands within Unincorporated Santa Clara County). The SDS evaluated long-term growth potential for Stanford lands, including analysis of Minimal, Moderate and Aggressive Growth scenarios. The growth proposed under the 2018 General Use Permit corresponds with the 2035 Moderate Growth Scenario in the SDS.

- Continue to implement the policies of the Stanford Community Plan, including policies promoting compact urban development, housing, single-occupant vehicle trip reduction, resource conservation, and health and safety;
- Continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community ("flexibility with accountability");
- Authorize continuation of existing academic, academic support[3] and housing uses on the Stanford campus;
- Enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities;
- Enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique Escondido Village Graduate Student Residences project;
- Enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents;
- Prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing; and
- Support existing and new academic, academic support and housing uses by authorizing new and improved parking facilities, roadway, utility and infrastructure improvements, child care centers, facilities designed to promote vehicle trip reduction, and temporary trailers for construction surge space.

3.3 Project Location

Stanford is located on the San Francisco Peninsula, approximately 35 miles southeast of San Francisco, and 20 miles northwest of San Jose (see **Figure 3-1**). Stanford owns approximately 8,180 contiguous acres across six governmental jurisdictions, including unincorporated areas of Santa Clara County and San Mateo County, the cities of Palo Alto and Menlo Park, and the towns of Portola Valley and Woodside (see **Figure 3-2**).

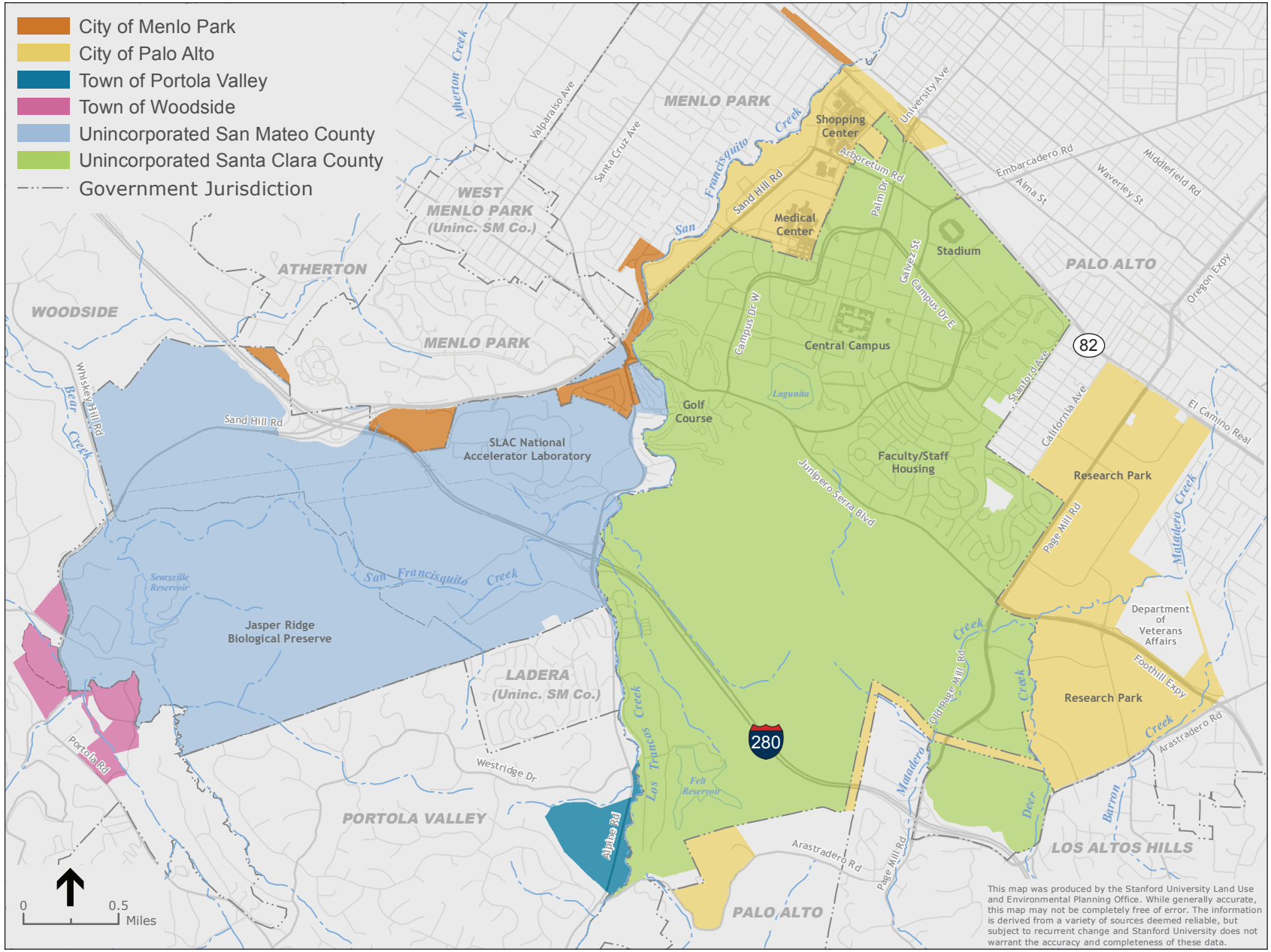
[3] Academic support uses include non-academic uses essential to the daily operation of Stanford; examples include, but are not limited to: retail food service, retail book and academic supplies, copy services, child care, convenience retail, gas and service stations, bike shop, and transit service [County of Santa Clara, *Planning Commission Staff Report*, File 7165-07-81-01 PAM 4 (& 7165-07-81-99P-99EIR-99GP), September 6, 2001].



SOURCE: Stanford LBRE LUEP; ESA

Stanford 2018 General Use Permit . 160531

Figure 3-1
Regional Map



SOURCE: Stanford LBRE LUEP; ESA

Stanford 2018 General Use Permit . 160531

Figure 3-2
Stanford University Lands

The proposed 2018 General Use Permit would apply only to the 4,017 acres of Stanford lands that are located within unincorporated Santa Clara County (see **Figure 3-3**; hereafter referred to as the Project site). As shown in Figure 3-3, the Project site is generally located southeast of Sand Hill Road, southwest of El Camino Real, northwest of Stanford Avenue and Page Mill Road, north of Arastradero Road, and east of Alpine Road. Regional freeway access to the Project site is provided by U.S. Highway 101 (U.S. 101) and Interstate 280 (I-280). El Camino Real [State Route 82 (SR 82)] and Foothill Expressway also provide regional access. The local routes from U.S. 101 to the Project site include Embarcadero Road, Oregon Expressway and University Avenue.

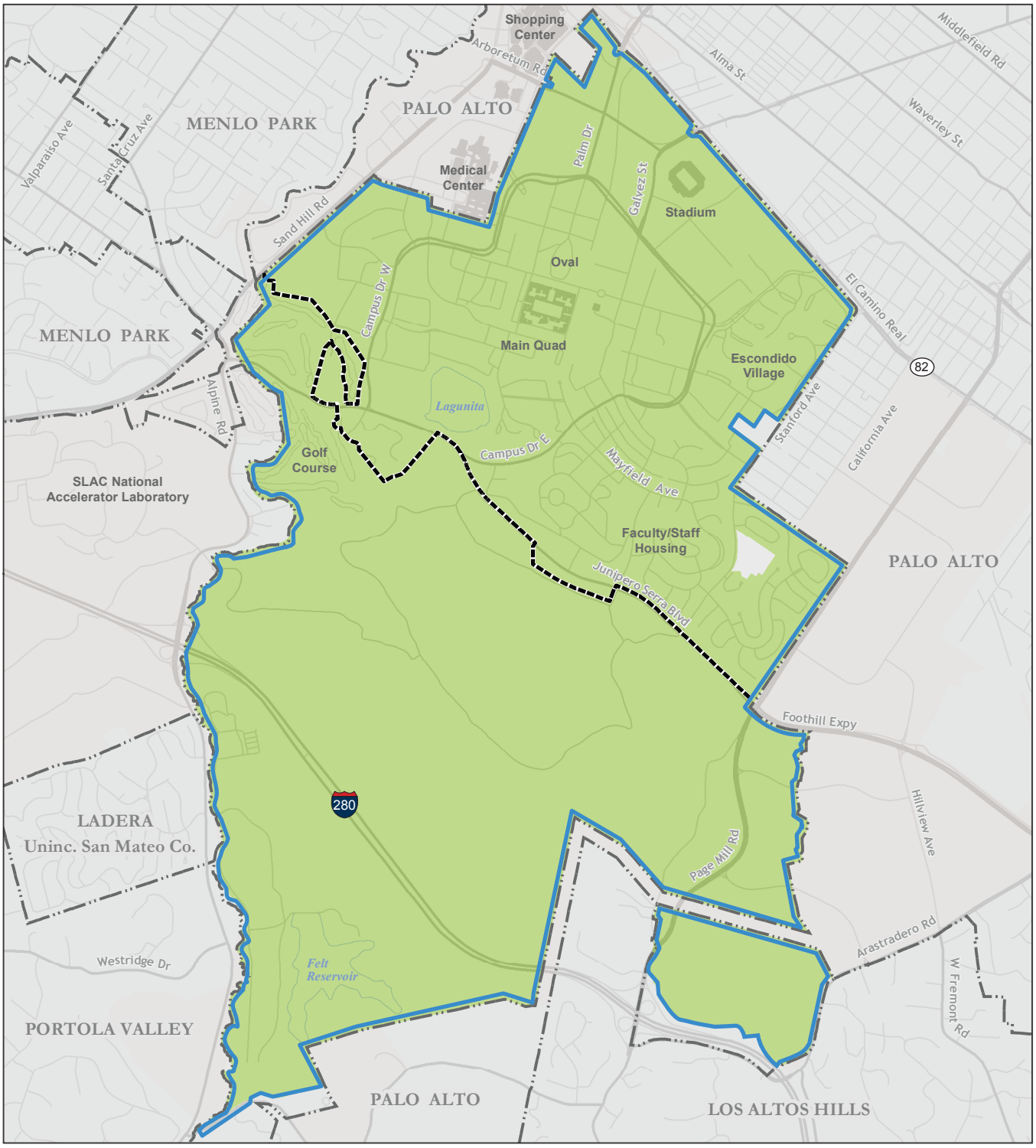
3.4 Project Site Characteristics

The Project site broadly consists of the Stanford central campus and the Stanford foothills, separated by Stanford's Academic Growth Boundary.[4] The Stanford central campus, including academic and academic support facilities and housing, is concentrated east of Junipero Serra Boulevard and located within Stanford's Academic Growth Boundary. The largely undeveloped Stanford lands within the foothills west of Junipero Serra Boulevard are located outside of Stanford's Academic Growth Boundary.

An aerial photograph of the Project site is presented in **Figure 3-4**. The topography is varied across the Project site. The slope gradually rises across the central campus area from the northeast towards the southwest, with elevations ranging from approximately 45 to 70 feet above sea level (asl) at El Camino Real, increasing to between approximately 150 and 165 feet asl along Junipero Serra Boulevard. Within the foothills west of Junipero Serra Boulevard, the slopes on the Project site are more pronounced, with the elevation peaking at approximately 490 feet asl before decreasing to between approximately 200 and 350 feet asl at I-280. West of I-280, the slopes on the Project site increase again, peaking at approximately 460 feet asl at the south edge of the Project site.

The Project site is located within the San Francisquito Creek and Matadero Creek watershed basins. The principal water bodies within the Project site are Lagunita Reservoir located within the central campus, and Felt Reservoir located within the foothills west of I-280. San Francisquito Creek and Los Trancos Creek extends north along much of the west edge of the Project site, and Matadero Creek and Deer Creek extend northeast through the east portion of the Project site.

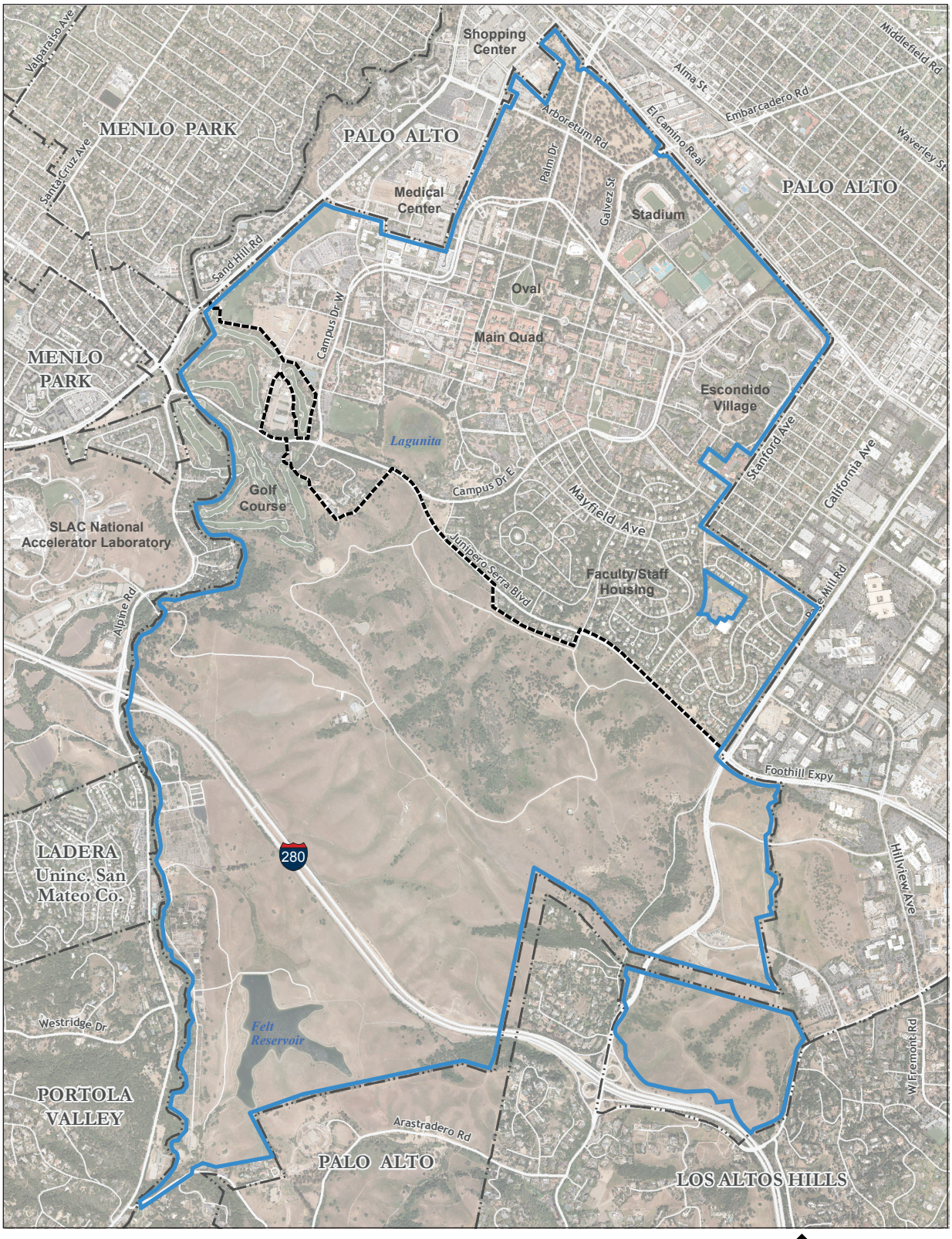
[4] The Stanford Community Plan describes the intent and use of the "Academic Growth Boundary." The Academic Growth Boundary is the primary mechanism for promoting compact urban development and resource conservation in the Community Plan. The Stanford Community Plan defines the allowable development for areas within and outside the Academic Growth Boundary. In general, all uses associated with the educational and residential function of the campus are directed inside the boundary (i.e., within the central campus), while areas outside the boundary (i.e., within the foothills) are reserved for open space and academic activities that require the foothill setting for their basic functioning. The Academic Growth Boundary will remain in place until at least 2025. No modification of the Academic Growth Boundary may be proposed or approved prior to 2025 until total building area on the central campus reaches 17.3 million square feet. The Stanford Community Plan requires a 4/5ths vote of all members of the Board of Supervisors to modify the Academic Growth Boundary location during this period. After 2025, the Academic Growth Boundary will continue to remain in place unless it is amended by majority vote of the County Board of Supervisors.



SOURCE: Stanford LBRE LUEP; ESA

Stanford 2018 General Use Permit . 160531

Figure 3-3
Stanford University Land Subject to Proposed 2018 General Use Permit



SOURCE: Stanford LRBE LUEP, ESA

Stanford 2018 General Use Permit . 160531

Figure 3-4
Aerial Photo of Project Site

Within the Academic Growth Boundary, the Stanford campus includes a diverse mix of land use development, including classrooms, academic offices, laboratory space, athletic venues, museums, performance and arts venues, lands for outdoor learning, student housing, and faculty/staff housing. The athletics facilities include a football stadium (Stanford Stadium), gymnasiums, an aquatic center, basketball arena, sports courts, golf driving range, and several outdoor fields to accommodate field hockey, lacrosse, soccer, and other field sports. Cultural facilities on campus including Bing Concert Hall, Cantor Arts Center, the Anderson Collection, Memorial Auditorium, Frost Amphitheater and other smaller spaces supporting lectures, concerts, and other cultural events. The Arboretum is a large landscaped area located along Palm Drive between Campus Drive and El Camino Real.

Supporting facilities on the Stanford campus include a network of public and private roadways, bikeways and walkways; parking facilities; utilities; flood control facilities; and other urban improvements. Stanford's internal circulation system consists of sixteen roadways that provide access to the campus (known as gateways). The majority of these roadways connect to the Campus Drive loop, which is the primary internal circulation roadway within the campus. The campus has eight existing parking structures, and several dozen surface parking lots. Notable campus utilities include the Stanford Energy System Innovations (SESI) energy supply system, including the new Central Energy Facility (CEF).

The mostly undeveloped Stanford foothills within the Project site include a mixture of grasslands, woodlands and riparian areas. The Stanford foothills also support livestock grazing and other agricultural uses, academic facilities, Stanford's golf course, and public and private trails. I-280 and Page Mill Road are the two major roads that divide the Stanford foothills.

Areas within the Stanford foothills are protected through established biological reserves and conservation easements pursuant to Stanford's Habitat Conservation Plan.

3.5 Existing Project Site Development and Population[5]

Table 3-1 presents a summary of existing development on Stanford lands within unincorporated Santa Clara County. As of Fall 2015, there was an estimated 9.62 million square feet of academic and academic support development, and 4.78 million square feet of student housing within the Project site. Student housing as of Fall 2015 totaled approximately 11,300 occupied beds, and there were 937 faculty/staff housing units within the Project site.

5 This section presents a summary of existing conditions at Stanford as of Fall 2015. Please see Section 5.0, Introduction to Environmental Analysis for additional detail on establishment of the existing environmental setting in this EIR.

TABLE 3-1
SUMMARY OF EXISTING DEVELOPMENT ON PROJECT SITE – FALL 2015

Building Area (Square Feet)			Housing Quantity		
Academic and Academic Support Buildings[a]	Student Housing[b]	Total	Student Housing (Occupied Beds)	Faculty/Staff Housing (Units)	Parking (spaces)
9,617,931	4,779,301	14,397,232	11,293	937	18,125

[a] Represents academic and academic support facilitates for which building permits have been obtained as of Fall 2015.
[b] Represents student housing that has been completed through the framing phase as of Fall 2015.

SOURCE: Stanford University Land Use and Environmental Planning Office, 2016

Table 3-2 presents a summary of existing Stanford students, faculty and staff populations. As shown in Table 3-2, as of Fall 2015, Stanford had a total of 30,943 students, faculty and staff. The on-campus residential population includes the portion of the students, faculty and staff presented in Table 3-2 that live on-campus, and also accounts for family members of those graduate students and faculty/staff that live on-campus. As of Fall 2015, the on-campus residential population was estimated at 14,902, including 12,367 students, faculty and staff, and 2,535 family members of graduate students and faculty/staff.

TABLE 3-2
STANFORD STUDENT, FACULTY, AND STAFF POPULATION – FALL 2015

Affiliation	Population
Undergraduate Students	6,994
Graduate Students, including PhDs	9,196
Postdoctoral Students[a]	2,264
Faculty[b]	2,959
On-Campus Staff[c]	8,612
Other (Non-Matriculated Students)[d]	918
Total	**30,943**

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.

SOURCE: Stanford University Land Use and Environmental Planning Office, 2016

Table 3-3 presents a summary of other worker populations that also contribute to the on-campus population at Stanford. This includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers. These populations are presented separately because many members of these populations do not work on the campus on a daily or year-round basis, or are not directly employed by Stanford. As

shown in Table 3-3, as of Fall 2015, there were 8,826 of the other worker populations at Stanford. Based on their commute frequency, the estimated daily population of other workers is 5,136.

TABLE 3-3
OTHER WORKER POPULATIONS AT STANFORD – FALL 2015

Affiliation	Population	Daily Campus Population[h]
Casual Employees[a]	2,080	416
Contingent Employees[b]	980	510
Temporary Employees[c]	1,390	1,085
Non-Employee Academic Affiliates, 20Percent FTE[d]	1,259	215
Non-Employee Academic Affiliates, FTE[d]	1,377	1,171
Third Party Contract Workers [e]	300	300
Janitorial Contract Workers[f]	240	240
Construction Contract Workers [g]	1,200	1,200
Total	**8,826**	**5,136**

[a] Casual employees are hourly workers less than 50 percent FTE and working no more than 980 hours per year, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[b] Contingent employees are salaried workers with roles that are comparable to staff, working less than 50 percent full-time equivalent (FTE) and/or working less than six months.
[c] Temporary workers are hourly workers at 50 percent FTE or more working no longer than six months, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[d] Other non-employee academic affiliates include affiliated teaching staff, adjunct professors, and visiting scholars. These are not typically full-time positions, with some members of this population visiting the campus less than 20 percent of the time
[e] Third party contract workers include food service workers at on-campus cafeterias and child care center workers.
[f] Janitorial contract workers are third party contractors working off-peak hour morning and evening shifts.
[g] Construction contract workers are related to ongoing construction projects on the campus.
[h] Please refer to Section 5.12, Population and Housing for additional information describing differences between "population" and "daily campus population."

SOURCE: Stanford University Land Use and Environmental Planning Office, 2017

3.6 Existing County Regulation of Stanford Lands within Unincorporated Santa Clara County

The County of Santa Clara currently regulates land uses on the Stanford lands within its jurisdiction through several mechanisms, including the 2000 General Use Permit, the Stanford Community Plan, the County Zoning Ordinance, and the 1985 Land Use Policy Agreement between the County of Santa Clara, City of Palo Alto and Stanford University. The following provides a brief overview of each; please refer to **Section 5.10**, **Land Use and Planning**, for additional detail.

3.6.1 2000 General Use Permit

The General Use Permit was most recently adopted in 2000 (and hereafter referred to as the 2000 General Use Permit)[6] and is the implementation document that permits additional academic facilities and housing units, and establishes conditions of approval, consistent with the goals,

[6] The 2000 General Use Permit replaced the 1989 General Use Permit.

strategies, and policies of the Stanford Community Plan. Key functions of the 2000 General Use Permit are to establish the allowed land uses, specify the quantity of new academic and academic support space and related infrastructure that may be constructed; specify the quantity of housing units and student beds that may be constructed; and identify conditions of approval that apply to new construction and campus operations to minimize effects to the surrounding community.

The 2000 General Use Permit as amended allows the construction of:

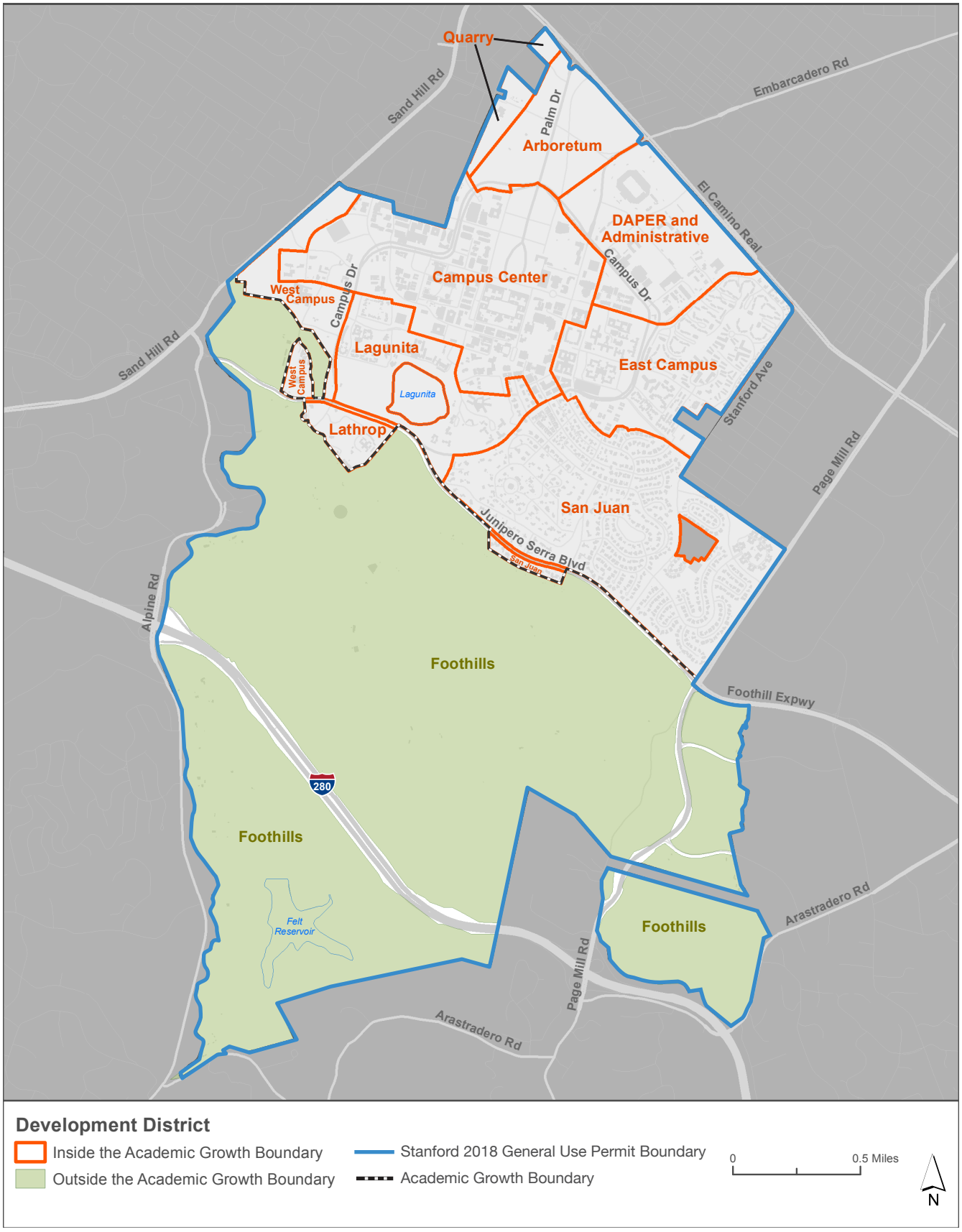
- 2,035,000 net new square feet[7] of new academic and academic support uses;
- 3,018 net new housing units/beds for students, faculty and staff;
- 40,000 net new square feet of childcare and community center space;
- up to 50,000 net new square feet of construction surge space;
- 2,300 net new parking spaces; and
- associated infrastructure.

In May 2016, the County authorized an additional 1,450 housing units to be constructed under the 2000 General Use Permit (for a total of 4,468 housing units/beds authorized under the 2000 General Use Permit).

The 2000 General Use Permit divides the Project site into ten development districts, as illustrated in **Figure 3-5**. Under the 2000 General Use Permit new academic and academic support space can be constructed in any of the development districts except the Arboretum Development District. New development in the Lathrop Development District is limited to 20,000 square feet, plus an additional 21,000 square feet pursuant to a separate use permit application that was filed prior to approval of the 2000 General Use Permit. New development in the Foothills Development District is limited to 15,000 square feet with no individual building or facility exceeding 5,000 square feet.

The 2000 General Use Permit includes more than 100 conditions regulating construction activities and campus operations, establishes monitoring requirements and identifies project approval processes. The County Planning Office prepares annual reports, reviewed and approved by the Planning Commission, documenting Stanford's development activity and compliance with the 2000 General Use Permit.

[7] Refers to gross square footage pursuant to Government Code Section 65995 (County of Santa Clara, Department of Planning and Development; letter to Catherine Palter, Stanford University, September 23, 2009).



SOURCE: Stanford LBRE LUEP; ESA

Stanford 2018 General Use Permit . 160531

Figure 3-5
Existing Development Districts for Project Site under 2000 General Use Permit

3.6.2 Stanford Community Plan

The Stanford Community Plan was adopted in 2000 as a component of the County of Santa Clara General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. It contains seven elements, including Growth and Development; Land Use; Housing; Circulation; Open Space; Resource Conservation; and Health and Safety. The Stanford Community Plan is guided by seven major policy directions:

a. promote compact urban development together with conservation of natural resources;

b. allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects ("flexibility with accountability");

c. accommodate development for academic uses and housing on lands only within an Academic Growth Boundary, or AGB, while limiting the uses and development potential for lands outside the AGB to conserve open space and natural resources;

d. differentiate the major land uses within the plan area according to areas in academic use, housing for faculty/staff, and open space outside the AGB;

e. plan for and ensure that substantial new housing development occurs concurrently with approval for increases in academic space and facilities;

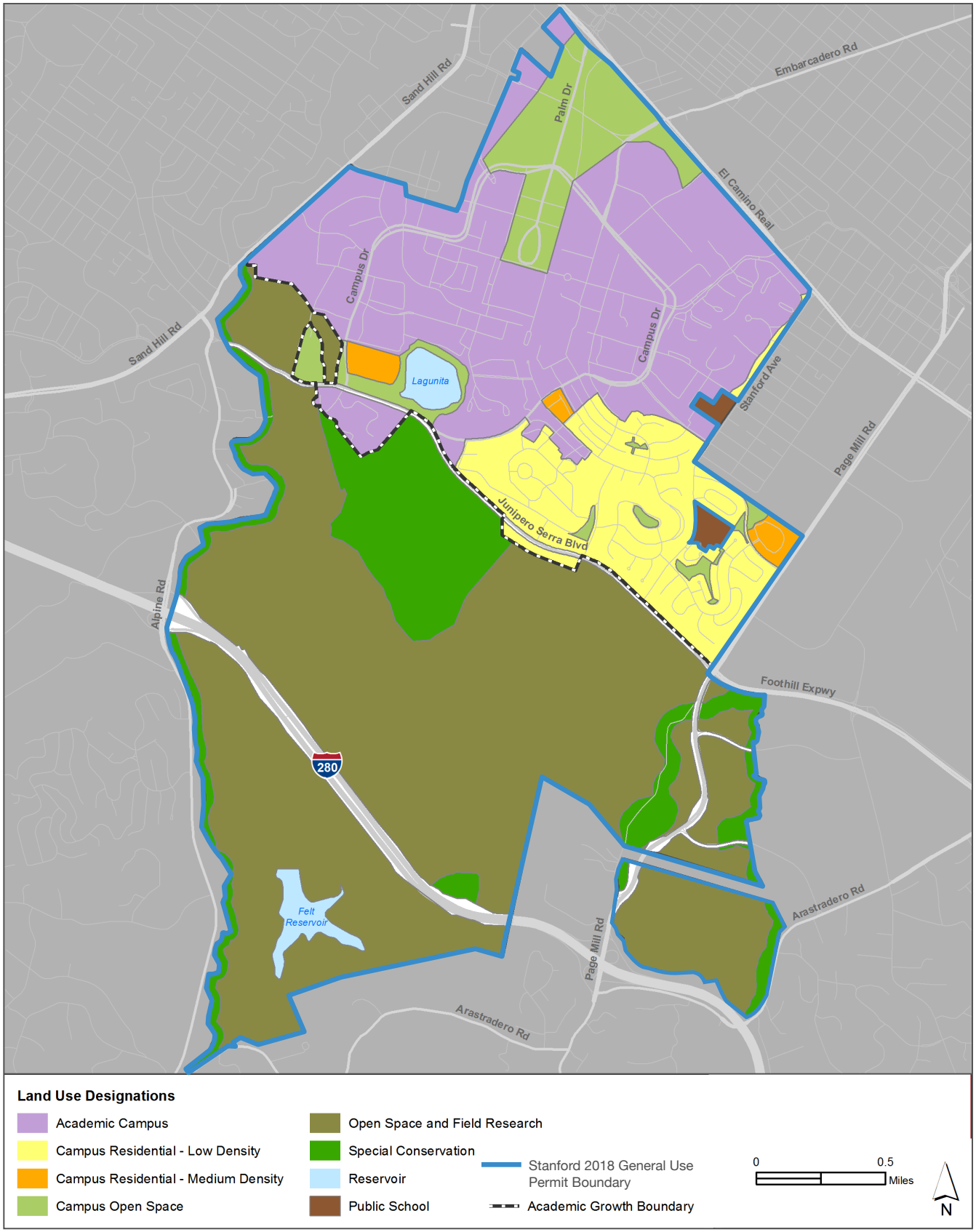
f. meet mobility and access needs primarily though means other than major road improvements, including appropriate integration of land use, transit services, transportation demand management, and management of the number of net new commute trips which may be generated; and

g. achieve the various conservation, public health and safety goals by emphasizing preventive measures or avoidance of impacts, requiring mitigation for impacts that may occur, and promoting resource restoration.

The Stanford Community Plan establishes land use designations and allowable development within the Plan area. **Figure 3-6** illustrates existing land use designations for the Stanford campus as specified in the Stanford Community Plan. As shown in Figure 3-6, land use designations within the Academic Growth Boundary include Academic Campus; Campus Residential (both Low and Medium Density); and Campus Open Space. Land use designations outside the Academic Growth Boundary include Open Space and Field Research; and Special Conservation Areas. Please refer to **Section 5.10**, **Land Use and Planning**, for a further detail for each of these land use designations.

3.6.3 County of Santa Clara Zoning Ordinance

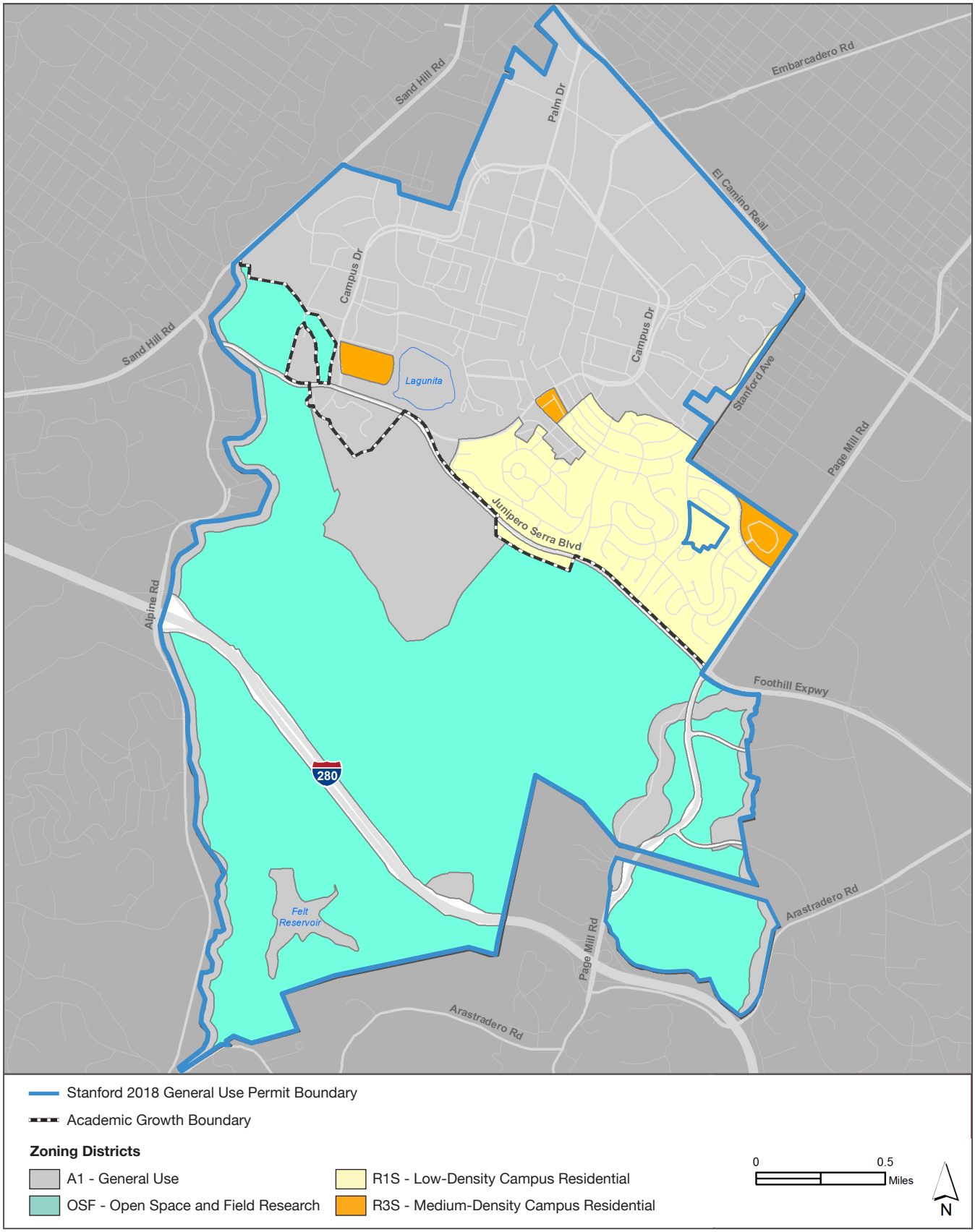
The County of Santa Clara Zoning Ordinance implements the County of Santa Clara General Plan, and regulates land use and development within the unincorporated areas within Santa Clara County. The current County zoning districts on Stanford lands in unincorporated Santa Clara County are illustrated in **Figure 3-7**. As shown in Figure 3-7, zoning districts within the Academic Growth Boundary include General Use (A1); Low-Density Campus Residential (R1S) and Medium-Density Campus Residential (R3S). Zoning districts outside the Academic Growth Boundary include Open Space and Field Research (OSF); and General Use. Please refer to Section 5.10, Land Use and Planning, for further detail for each of these zoning districts.



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LBRE LUEP; ESA

Figure 3-6
Existing Land Use Designations for Project Site under Stanford Community Plan



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LBRE LUEP; ESA

Figure 3-7
Existing Zoning District for
Project Site in County Zoning Map

3.6.4 1985 Land Use Policy Agreement

In recognition of Stanford's multi-jurisdictional setting, the County of Santa Clara, the City of Palo Alto and Stanford entered into a three-party agreement entitled the "1985 Land Use Policy Agreement."[8] The agreement defines what land uses may remain in the unincorporated County and what uses must be annexed to Palo Alto; affords Palo Alto review opportunities for Stanford projects on the unincorporated County lands; recognizes Stanford's provision of municipal services on Stanford's lands; and recognizes that Stanford's lands are held in perpetual trust for educational purposes.

3.7 Development under the 2000 General Use Permit

Table 3-4 presents a summary of development that has occurred under the 2000 General Use Permit through Fall 2015, by year.

TABLE 3-4
DEVELOPMENT SUMMARY FOR THE 2000 GENERAL USE PERMIT: FALL 2001 TO FALL 2015

Year	Net Addition of Academic and Academic Support Development (square feet)[a]	Net Addition of Housing Development (square feet)[b]	Net Addition of New Housing Units	Parking
2001	0	0	102	(29)
2002	22,790	140,854	331	31
2003	32,023	0	0	394
2004	92,915	0	0	(91)
2005	39,763	0	0	(159)
2006	116,237	1,661	(8)	(659)
2007	0	0	0	(798)
2008	323,264	267,683	349	93
2009	72,776	192,981	514	(313)
2010	126,676	185,218	70	(56)
2011	174,723	0	90	810
2012	223,725	2,360	9	(236)
2013	165,092	215,274	427	(68)
2014	52,735	2,084	2	526
2015	(45,179)	43,289	133	(695)
Total	**1,397,540**	**1,051,054**	**2,019**	**(1,250)**

NOTE: Parenthesis in this table indicates decrease from that which existed prior to implementation of 2000 General Use Permit.

[a] Represents academic and academic support facilitates for which building permits have been obtained.
[b] Represents student and faculty/staff housing that has been completed through the framing phase.

SOURCE: County of Santa Clara Planning Office, Annual Report No. 15, June 2016

[8] Please see https://www.sccgov.org/sites/dpd/Programs/Stanford/Pages/1985Policy.aspx.

As shown in Table 3-4, as of Fall 2015, approximately 1.4 million net square feet of the academic and academic support uses were developed[9] under the 2000 General Use Permit. Notable academic and academic support uses developed under the 2000 General Use Permit include the Knight Management Center – Graduate School of Business; the Lorry I. Lokey Stem Cell Research Building (SIM1); the Shriram Center for Bioengineering and Chemical Engineering; the Jerry Yang and Akiko Yamazaki Environment and Energy Building; the Jen-Hsun Huang School of Engineering Center; Spilker Engineering and Applied Sciences Building; McMurty Building for the Department of Art and Art History, Bing Concert Hall; and Stanford's Central Energy Facility (CEF).

Table 3-4 indicates that, as of Fall 2016, 2,404 housing units/student beds were developed[10] under the 2000 General Use Permit. Stanford housing developed under the 2000 General Use Permit includes a number of developments that increased density of existing residential properties within the Escondido Village area (e.g., Kennedy Graduate Housing, Escondido Village Studios 5 and 6, Blackwelder/Quillen dormitories, and Mirrielees Phase I and II); infill student housing projects (e.g., Munger Graduate Residences, and Crothers Renovation); and limited new faculty/staff housing (e.g., Olmsted Terrace).

Table 3-5 below presents a summary of cumulative permitted development within the Project site prior to implementation of the 2000 General Use Permit and cumulative permitted development prior to implementation of the proposed 2018 General Use Permit.

TABLE 3-5
CUMULATIVE DEVELOPMENT SUMMARY

	Academic and Academic Support Development (square feet)	Student Housing Development (square feet)[a]	Student and Faculty/ Staff Housing Units	Parking
Cumulative Development Prior to Implementation of 2000 General Use Permit	8,220,391	3,886,516	10,226[b]	19,351
Cumulative Development Prior to Implementation of Proposed 2018 General Use Permit	10,255,391	6,638,070	14,666[c]	20,171

[a] This does not include faculty/staff unit square footage.
[b] Includes 873 faculty/staff units and 9,353 student occupied beds.
[c] Includes 937 faculty/staff units and 13,729 student occupied beds. Includes the Escondido Village Graduate Residences Project, which will not be completed and occupied until 2020.

SOURCE: Stanford University Land Use and Environmental Planning Office, 2017

9 Represents academic and academic support facilitates for which building permits have been obtained by Fall 2015.
10 Represents housing that has been completed through the framing phase by Fall 2015.

3.8 Proposed 2018 General Use Permit and Related Actions

On November 21, 2016, Stanford applied for a new General Use Permit. The proposed 2018 General Use Permit would authorize an increment of campus growth and land use development, anticipated to take place over a period that would extend from approximately 2018 through 2035. Stanford seeks County approval of the proposed 2018 General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map. The proposed increment of future development would accommodate an amount of growth that corresponds to the 2035 Moderate Growth Scenario included in Stanford's Sustainable Development Study, approved by the County in 2009.

The proposed 2018 General Use Permit would allow:

- 2,275,000 net new square feet of academic and academic support facilities (plus any square footage remaining under the 2000 General Use Permit);
- 3,150 net new housing units/beds, of which up to 550 units would be available for faculty, staff, postdoctoral scholars, and medical residents;
- 40,000 net new square feet of childcare center space and other space that reduces vehicle trips (e.g., transit hub);
- utilization of up to 50,000 square feet of construction surge space authorized under the 2000 General Use Permit;
- utilization of the remaining unbuilt parking authorized under the 2000 General Use Permit (estimated at 1,480 spaces remaining after completion of the Escondido Village Graduate Residences and associated parking in 2020);[11]
- creation of a parking reserve for up to 2,000 net new parking spaces (with Planning Commission approval); and
- associated infrastructure.

Similar to the 2000 General Use Permit, the proposed 2018 General Use Permit would apply to all land uses within unincorporated Santa Clara County that would require a conditional use permit, Architecture and Site Approval (ASA), or Planning Commission approval under the County Zoning Ordinance. The proposed 2018 General Use Permit would not apply to uses on Stanford lands that are permitted by right under the County Zoning Ordinance.[12] However, all development that would be authorized to occur under the proposed 2018 General Use Permit, as well as development permitted by right, would be counted against the proposed 2018 General Use Permit development and housing unit limits.

New building square footage and housing, as well as most infrastructure subject to the proposed 2018 General Use Permit would be constructed on vacant land, infill sites and redevelopment sites

[11] There are an estimated 3,156 remaining unbuilt parking spaces as of Fall 2015.

[12] Examples of uses permitted by right include single-family residences within the A1 zoning district; single-family and two-family residences and secondary dwelling units within the R1S zoning district; and agriculture and field research land uses within the OS/F zoning district.

within the Academic Growth Boundary. As occurred under the 2000 General Use Permit, some infrastructure improvements such as underground pipelines, electrical transmission lines, water supply improvements, and habitat improvements could occur outside the Academic Growth Boundary.

No site-specific projects and locations have been identified for development under the proposed 2018 General Use Permit. Each individual building or project that would be developed pursuant to the proposed 2018 General Use Permit would require submittal of an application to the County at the time proposed, and subject to additional discretionary review prior to consideration of approval by the County.

Stanford estimates that all remaining academic and academic support development, and nearly all remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020. The proposed 2018 General Use Permit includes a provision to allow any remaining square footage authorized under the 2000 General Use Permit to be carried over to the 2018 General Use Permit.

3.8.1 Development under the 2018 General Use Permit

Academic / Academic Support Space and Housing

Table 3-6 and **Figure 3-8** present the development districts and the distribution of development within the campus under the proposed 2018 General Use Permit. As shown in Table 3-6, 1.8 million sf, or nearly 80 percent of the anticipated academic and academic support space proposed under the 2018 General Use Permit would occur in the Campus Center Development District. Proposed new housing would be focused in the East Campus and Lagunita Development Districts, along with new high-density housing in the Quarry Development District. Academic, academic support space, and housing may be redistributed upon Planning Commission approval.

As under the 2000 General Use Permit, the proposed academic, academic support facility, and housing development limits under the 2018 General Use Permit would represent "net new" space or housing. Existing buildings on the campus may be demolished over the course of implementation of the 2018 General Use Permit; the demolished space square footage would be added to the inventory of new academic and academic support square footage and housing units authorized for construction.[13]

At the time that the County considers approval of the proposed 2018 General Use Permit, Stanford may not have received project-specific approval for construction of all of the development authorized under the 2000 General Use Permit. If the proposed 2018 General Use Permit is approved under such conditions, any remaining unbuilt academic and academic support space

[13] In other words, demolished space is tracked as negative square footage. New space is tracked as positive square footage. The net total cannot exceed the permitted limit. For example if 30,000 square feet are demolished, this is tracked as -30,000. If a new 200,000 square foot building is constructed, the net total is 170,000 square feet.

TABLE 3-6
2018 GENERAL USE PERMIT PROPOSED DEVELOPMENT DISTRIBUTION BY DEVELOPMENT DISTRICT

Development District	Net New Academic and Academic Support Space (Net New Square Feet)	Net Addition Housing Development (Number of Units/Beds)
Quarry	200,000	550
Arboretum	0	0
DAPER[a] & Administrative	200,000	0
Campus Center	1,800,000	200
East Campus	20,000	1,600
West Campus	35,000	0
Lagunita	20,000	800
Lathrop	20,000	0
San Juan	0	0
Foothills	0	0
Total	**2,275,000**	**3,150**

[a] DAPER = Department of Athletics, Physical Education, and Recreation

SOURCE: Stanford University Land Use and Environmental Planning Office, 2016

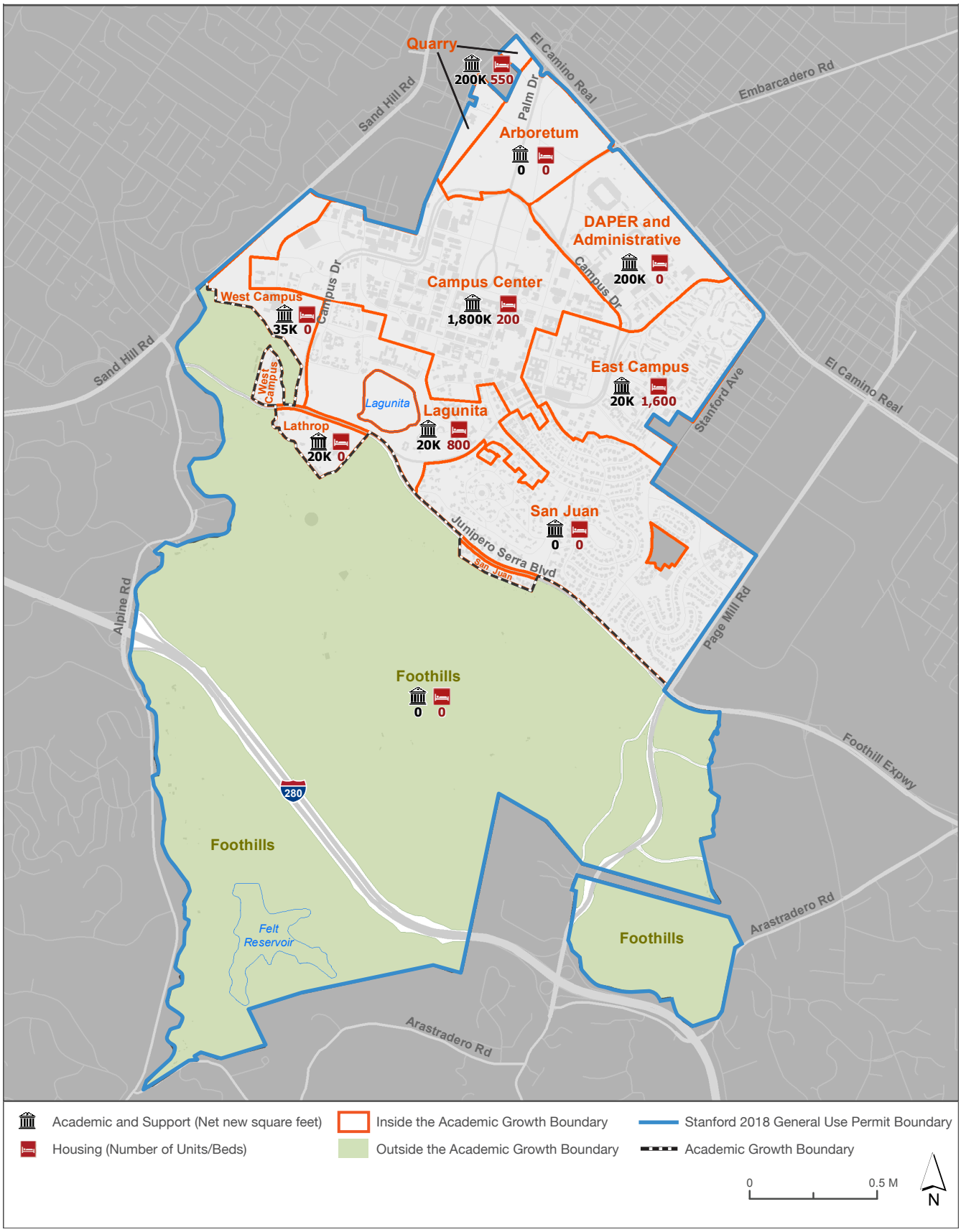
square footage that was authorized by the 2000 General Use Permit would be carried over to the proposed 2018 General Use Permit.

Under Stanford's proposed 2018 General Use Permit, which incorporates Conditions E.2 and F.4 from the 2000 General Use Permit, any significant deviation (in an amount determined appropriate by the County) from the development district distributions shown in Table 3-6 would require additional environmental review and approval by the Planning Commission. However, no redistribution of any additional square footage or any housing units to the Lathrop Development District, or redistribution of any square footage or housing units to the Arboretum Development District, would be allowed under the 2018 General Use Permit.

Development District Boundary Changes

Stanford also proposes two modifications to certain development district boundaries to better comport to existing zoning boundaries and conditions on the ground. **Figure 3-9** illustrates the proposed modifications to the development district boundaries. The two modifications would include:

- modification of the boundary the Campus Center development district to include the existing Knight Management Center, which Stanford indicates would be in keeping with the intent of this district, rather than the DAPER and Administrative development district in which it currently is located; and
- modification of the San Juan development district boundary so that it is coterminous with the County's Low-Density Campus Residential (R1S) zoning district boundary for this area (as modified by the proposed zoning change that is part of the Project).

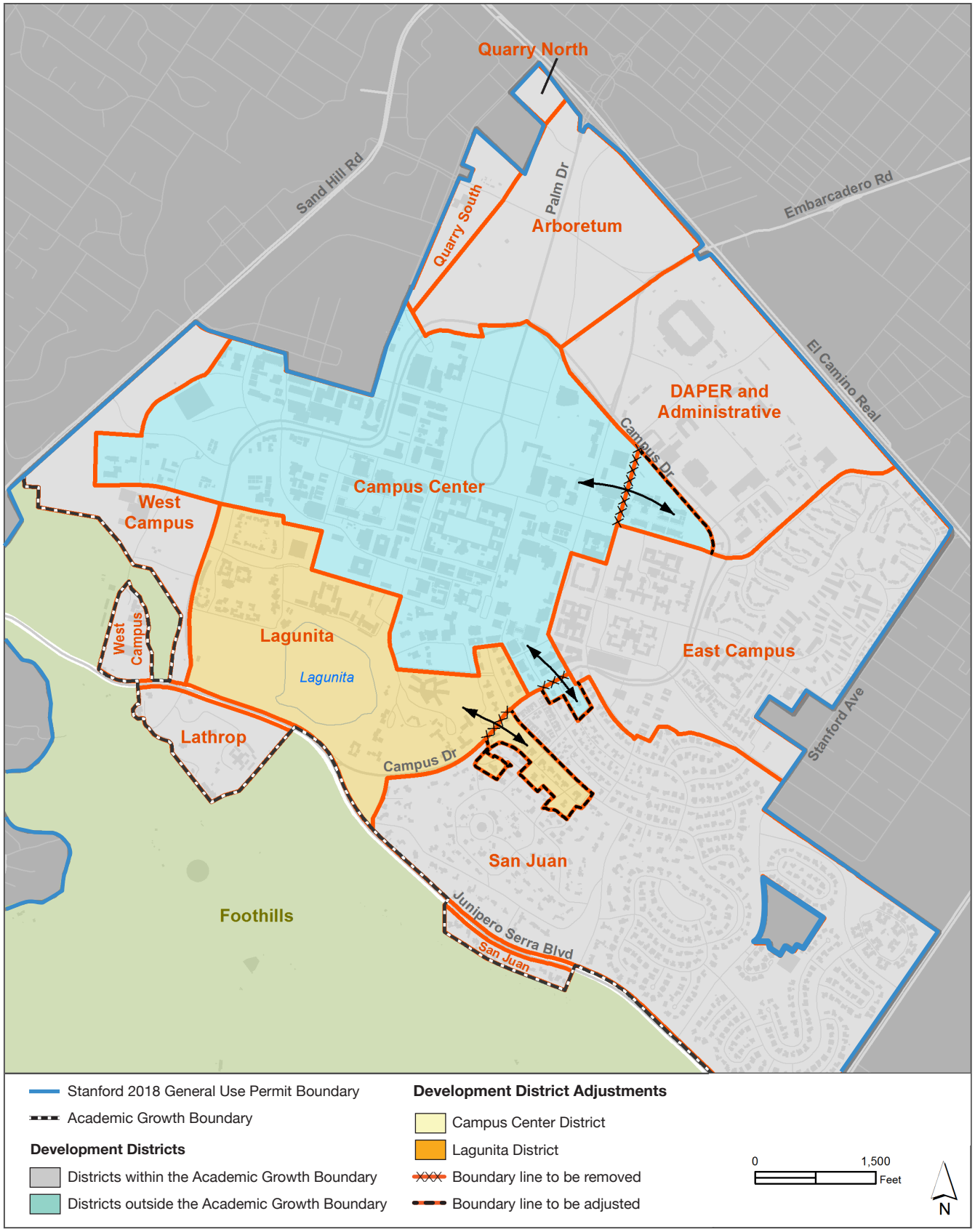


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SOURCE: Stanford LBRE LUEP; ESA

Figure 3-8

Development Districts under 2018 General Use Permit, and Proposed Distribution of Academic, Academic Support and Housing



SOURCE: Stanford LBRE LUEP; ESA

Stanford 2018 General Use Permit . 160531

Figure 3-9
Proposed Modifications to the Development District Boundaries

Housing Linkage

As with the 2000 General Use Permit, under the proposed 2018 General Use Permit the development of academic and academic support space would be linked to the development of housing units. **Table 3-7** presents the housing linkage proposed under the 2018 General Use Permit, and proposed interim milestones for development.[14] Interim housing unit milestones would be required to be met for each increment of 500,000 square feet of academic and academic support space to ensure housing construction keeps pace with academic and academic support facility development.

TABLE 3-7
MINIMUM REQUIRED HOUSING PER THE HOUSING LINKAGE RATIO UNDER PROPOSED 2018 GENERAL USE PERMIT

Academic and Academic Support Space (Net New Square Feet)	Housing Units/Beds at 1/826[a] (Net New Square Feet)	Cumulative Number of Housing Units/Beds
0 – 0.5 Million	605	605
0.5 – 1.0 Million	605	1,210
1.0 – 1.5 Million	605	1,815
1.5 – 2.0 Million	605	2,420
2.0 - 2.275 Million	333	2,753

NOTES:

This table represents the minimum housing required per the housing linkage ratio. However, as indicated in Table 3-6, the 2018 General Use Permit proposes a greater number of housing units/beds (3,150) than that required by the housing linkage ratio.

[a] 1 housing unit/bed for every 826 net new square feet

SOURCE: Stanford University Land Use and Environmental Planning Office, 2016

Similar to the 2000 General Use Permit Condition F.7, under the proposed 2018 General Use Permit, Stanford seeks a condition that would allow it to build additional housing beyond the proposed development limit of 3,150 housing units/beds, subject to additional environmental review and approval by the Planning Commission.

Child Care, Surge Space and Other Development

As under the 2000 General Use Permit, under the proposed 2018 General Use Permit certain specific types of development would not be counted towards the proposed development limits. This exempted development would include 40,000 net new square feet of child care space and other space that reduces vehicle trips, such as a transit hub. Stanford also proposes to continue to utilize up to 50,000 net new square feet of construction surge space that was authorized in the

[14] As shown in Table 3-7, under the proposed Project, Stanford would use the same housing linkage ratio as was identified in Condition F.8 in the 2000 General Use Permit. The housing linkage is required under the Community Plan.

2000 General Use Permit. Surge space is used to temporarily house uses that may be displaced during a construction project.

Parking

Under the proposed 2018 General Use Permit, the authorized amount of parking would be unchanged from the limits established by the 2000 General Use Permit. Consequently, the 2018 General Use Permit would carry over the remaining unbuilt parking authorized under the 2000 General Use Permit, estimated at 3,156 spaces as of Fall 2015. However, Stanford proposes that certain types of parking at the campus be exempt from inclusion in the authorized parking limit, including parking associated with trip-reduction programs, electric vehicle charging stations, police and fire department use, and high-density faculty and staff housing.

In addition, the proposed 2018 General Use Permit includes an option to construct up to 2,000 additional parking spaces subject to Planning Commission review and approval, if any one of the following conditions apply: 1) Stanford is achieving the No Net New Commute Trips standard; 2) such parking serves a purpose that is not likely to result in a substantial increase in peak-hour commute trips; or 3) unforeseen circumstances occur due to changes in background conditions would require provision of additional parking (such as prolonged or permanent disruption of transit service).

Infrastructure

As with the 2000 General Use Permit, the proposed 2018 General Use Permit would accommodate construction of campus infrastructure improvements to support authorized development proposed, including, but not limited to, utilities and circulation improvements. While Stanford proposes no new building square footage or housing in the San Juan, Arboretum and Foothills development districts, it is possible that some infrastructure improvements such as pathways, underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, and similar types of improvements could be constructed throughout the lands subject to the proposed 2018 General Use Permit. As one example, Stanford proposes to construct the Suggested Routes to School improvements on its lands in unincorporated Santa Clara County.

3.8.2 Proposed Adjustments to "No Net New Commute Trips" Compliance Methodology

The Stanford Community Plan establishes a "No Net New Commute Trips" standard, defined to mean no additional trips above a measured base level during the peak commute hours in the campus commute direction.[15] Pursuant to methodology developed in the 2000 General Use Permit, a baseline traffic count was established in 2001 to determine the existing level of peak commute trips. The baseline count was conducted at the 16 campus entry and exit points around the central

[15] Condition G.6 in the 2000 General Use Permit defines peak commute directions as entering the campus in the morning peak commute period and leaving the campus in the evening commute period. The peak commute periods are defined as the one-hour period of time between 7:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 6:00 p.m. with the highest volume of traffic.

campus, which together form a defined "cordon" around the central campus. In compliance with the 2000 General Use Permit, Stanford conducts annual monitoring traffic counts during the regular academic year using a County-approved methodology at the same cordon locations. The County conducts annual comparisons of each year's traffic counts to the baseline traffic counts to determine if the No Net New Commute Trips standard is being achieved.

The Stanford Community Plan recognizes that achieving the No Net New Commute Trips standard requires a combination of approaches including increasing the supply of on-campus housing, providing convenient support services on the campus and implementation and expansion of Stanford's transportation demand management (TDM) program (see subsection 3.8.3, below for additional detail on Stanford's TDM program). The Stanford Community Plan also includes a policy to credit Stanford's participation in off-campus trip reduction efforts that benefit the streets surrounding the campus toward achievement of the No Net New Commute Trips standard (Policy SCP-C8). The Stanford Community Plan recognizes that if Stanford does not achieve the No Net New Commute Trips standard, Stanford must contribute to improvements at impacted intersections or provide equivalent funding toward other transportation impact mitigation efforts [Implementation Recommendation SCP-C(i)(9)].

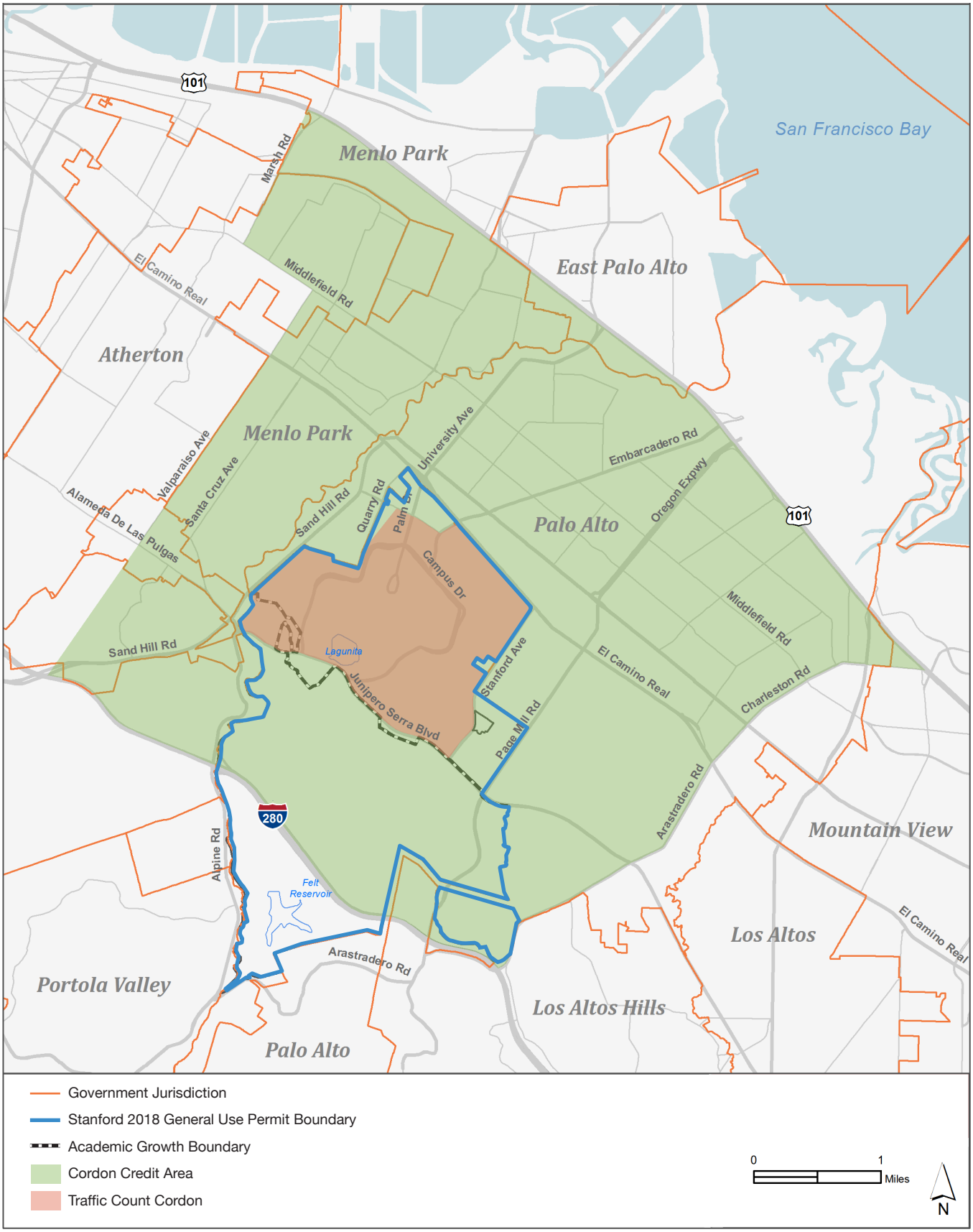
Under the proposed 2018 General Use Permit, Stanford commits to:

- continue to implement, and expand as needed, its TDM programs to help Stanford achieve its No Net New Commute Trips standard;
- continue to implement its off-campus trip reduction programs as contemplated by the Stanford Community Plan's trip credit policy; and
- if needed, provide funding to the County for other programs to reduce trips within a defined area or for intersection improvements.

Further, Stanford proposes that the 2018 General Use Permit make certain adjustments to the methods used to demonstrate compliance with the No Net New Commute Trips standard. Under the 2000 General Use Permit, a cordon was established around the campus where inbound and outbound traffic is monitored twice a year at 16 campus gateways (**Figure 3-10** illustrates the traffic count cordon area). Under the proposed 2018 General Use Permit, Stanford proposes to:

- conduct annual monitoring through automated means (e.g., imbedded loop detectors in pavement travel lanes, video detection or license plate recognition) as verified and approved by the County (instead of through manual monitoring methods as is done currently). Testing and calibration of new equipment would be coordinated with the County, and a County approval process would be established for replacement of monitoring equipment with new technologies as they become available;
- amend the trip credit policy to:
  - clarify that reduction of an off-campus trip can be recognized as long as one terminus for a trip is within the cordon credit area[16] (see Figure 3-10 for cordon credit area); and

[16] An example of this would be if Stanford shuttle service extends to East Palo Alto (outside the cordon credit area), and an East Palo Alto resident rides this shuttle from East Palo Alto to a business in Palo Alto (inside the cordon credit area).



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LBRE LUEP; ESA

Figure 3-10
Stanford Traffic Cordon and Trip Credit Area

  - include the funding of off-campus circulation infrastructure improvements as approved by the County, if those improvements would enhance safety or increase mobility for pedestrians, bicyclists and transit users within the local impact area; and

- if the No Net New Commute Trips standard cannot be achieved through trip reduction measures and trip credits alone, optionally achieve the No Net New Commute Trips standard by funding trip reduction programs (instead of funding intersection improvements, as is done currently) implemented by other entities in the vicinity, including programs that encourage and improve use of alternative transportation modes, and/or improve safety and mobility for pedestrians, bicyclists and transit users.

3.8.3 Other Commitments in the Proposed 2018 General Use Permit

Stanford currently implements a number of programs and practices to promote sustainability at the campus, including, but not limited to:

- **Energy Supply and Efficiency:** Stanford supports reduction of fossil fuel-based energy use in Stanford's academic and administrative buildings through on-site renewable power generation, conservation, and improved efficiency. In 2015, Stanford completed an overhaul of its campus heating and cooling system, known as Stanford Energy System Innovations (SESI), which replaced Stanford's steam-based heating system with a hot-water based heating system, and replaced its cogeneration plant with a more efficient Central Energy Facility (CEF). Stanford procures electricity via a Direct Access program from the grid through Electricity Service Providers that includes renewable resources within their portfolios. Stanford procures electricity from its Kern County Solar Generating Station and on-campus rooftop solar panels, which together meet more than half of the Stanford's campus electricity demand. In addition, Stanford implements several energy-saving programs for building retrofits and users, including its Whole Building Energy Retrofit Program (WBERP), Energy Retrofit Program (ERP), Energy Conservation Incentive Program (ECIP), and Building HVAC Recommissioning Program.

- **Water Supply and Conservation:** Stanford supports a number of efforts to reduce water use and promote water efficiency at the campus. Stanford's on-site water resources (surface water from creeks and ground water) provide non-potable irrigation water to the campus. Stanford developed a Water Conservation, Reuse and Recycling Master Plan in 2001, and is currently developing a Sustainable Water Management Plan to guide its long-term water supply development, water conservation, wastewater and storm-water management, and habitat conservation programs. Stanford also implements a Water Efficiency Program to decrease domestic water and improve water efficiency at the campus.

- **Transportation:** Stanford's TDM program was developed to reduce traffic-related impacts and related pollution and emissions on the campus and in the community by reducing the number of peak-hour trips and single-occupant vehicles, and boosting alternative transportation use. The Stanford TDM program includes a wide range of TDM program elements, including but not limited to, a fare-free transit shuttle system (Marguerite buses); direct incentives to commuters who choose alternative modes; paid parking at campus lots; subsidized carpools and vanpools; subsidized transit passes, free car care memberships, and bicycle infrastructure.

- **Solid Waste Reduction and Recycling:** Stanford implements a Waste Reduction and Recycling Program that serves all academic and athletic areas, student housing and

dining, and faculty and staff housing, the Stanford Linear Accelerator Center, and construction sites. Stanford recycles plastics, metal, glass, paper, cardboard, construction and demolition debris, organic materials, such as yard trimmings and food scraps, and electronic scrap.

Under the 2018 General Use Permit, Stanford commits to continue to implement, and update as needed, these sustainability programs and practices. In addition, to further minimize impacts of development under the proposed 2018 General Use Permit, Stanford proposes to achieve the following:

- During the life of the 2018 General Use Permit, Stanford would meet final California Air Resources Board Tier 4 standards for all construction equipment, except for chainsaws and paving phase equipment;
- During the life of the 2018 General Use Permit, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place) to minimize potential noise and vibration disruption;
- All Marguerite buses would be electric by 2035;
- 70 percent of Stanford Land Buildings and Real Estate and Bonair fleet vehicles would be electric by 2035; and
- During the life of the 2018 General Use Permit, Stanford would rely heavily on low-water-demand, native plants for new landscaping.

Stanford also agrees to make the following monetary contributions. To the extent that such payments result in physical improvements, the funded projects would undergo their own review and approval under CEQA and are not within the scope of this EIR.

- To contribute funding for affordable housing in the community in the amount of $20 per net new square foot of academic and academic support space, with this amount increasing annually with inflation;
- To contribute funding for improvements to parks in the College Terrace neighborhood in an amount equal to the City of Palo Alto's current Capital Improvement Program budget for such parks; and
- To contribute funding toward off-site bicycle infrastructure improvements in the cities of East Palo Alto, Palo Alto, Menlo Park and unincorporated San Mateo County to reduce the potential for local vehicle congestion effects by encouraging use of alternative modes of transportation. Stanford added this proposal based on community feedback received during outreach regarding the Project application and Notice of Preparation. The identified off-site bicycle improvements would address gaps in the bicycle network between existing or proposed infrastructure projects. These facilities, if approved and constructed by the relevant jurisdictions, would work in connection with Stanford's trip reduction program and assist Stanford in achieving the No Net New Commute Trips standard. The proposed off-site bicycle facility improvements are intended to remove Stanford commuter vehicle trips and reduce other local vehicular trips that contribute to local congestion. The non-Stanford vehicular trips anticipated to be reduced would be credited toward the No Net New Commute Trips standard on an annual basis commencing upon completion of each of the improvements. Each individual city or

county would decide whether or how to construct the improvements within its jurisdiction. Stanford would only receive credits toward the No Net New Commute Trips standard if the improvements are approved and constructed. The following presents a brief overview of the four sets of improvements; please see **Chapter 8**, **Special Considerations**, for additional detail about these facilities.

– *East Palo Alto - Clarke-Newell Connections*: Stanford would fund the design and implementation of improved connections to the planned bicycle and pedestrian overcrossing of US 101 in East Palo Alto between Clarke Avenue and Newell Road (expected to begin construction in fall 2017). While this approved overcrossing will remove a key barrier to bicycle travel, gaps in the bicycle network will remain on the local roadways connecting to the new bridge. Stanford proposes to fund improvements to support bicycle travel on both sides of the new Clark-Newell bicycle and pedestrian overcrossing.

– *Palo Alto - Hanover Street/Bol Park*: Stanford would fund bicycle infrastructure improvements in Palo Alto to connect existing bicycle facilities at Bol Park and the Stanford Perimeter Trail. The improvements would be installed along Hanover Street, which would provide a continuous route through southern Palo Alto neighborhoods and the Stanford Research Park to the Stanford campus. Stanford would fund improvements on Hanover Street to connect the Bol Park Path with the Stanford Perimeter Trail through either on-street or off-street bicycle facilities. Further, Stanford would fund improved lighting and landscaping of Bol Park, which would facilitate the multi-use path in the commute hours during the shorter daylight hours.

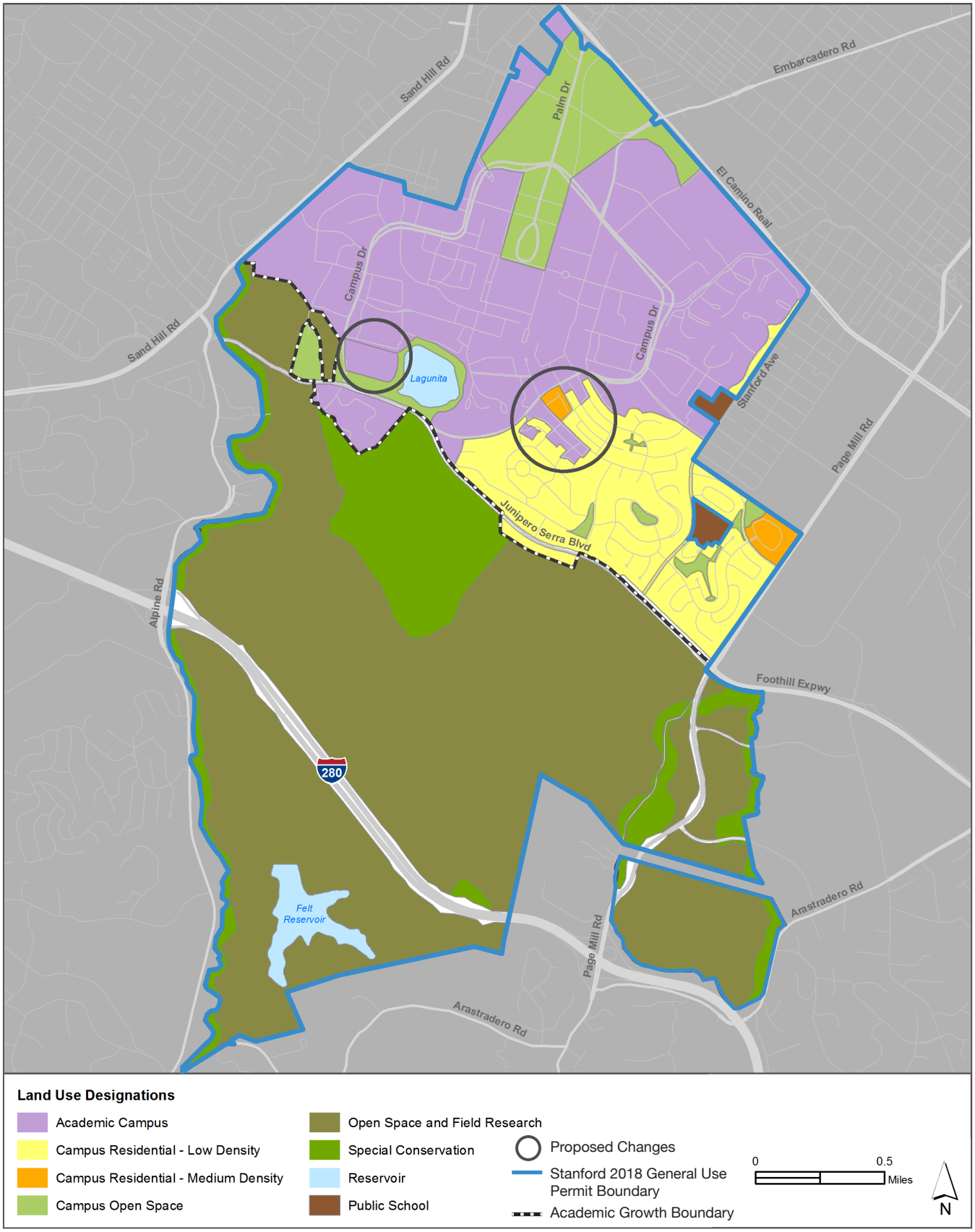
- *Menlo Park - Oak Grove Avenue Connection to Stanford West Apartments:* The City of Menlo Park is constructing buffered bicycle lanes and bicycle boulevards on Oak Grove Avenue, University Drive, and Crane Street as a pilot bicycle improvement. Stanford would fund an extension of the City of Menlo Park's project along Middle Avenue and San Mateo Drive to Sand Hill Road connections to create a bicycle commute route to the Stanford hospitals, shopping center and the campus.

- *San Mateo County - Santa Cruz Avenue/Alameda de las Pulgas:* Stanford would fund improvements identified by San Mateo County in its Santa Cruz Avenue/Alameda de las Pulgas Corridor Improvement Study. There is a gap in bicycle lanes in San Mateo County along Alameda de las Pulgas and Santa Cruz Avenue. Stanford would fund implementation of the County's identified solution to enhance mobility and safety, and help fill a gap in the network for bicyclists traveling from Menlo Park, Atherton, Woodside, and unincorporated San Mateo County.

3.9 Proposed Stanford Community Plan Amendments

The proposed project includes no modifications to any strategies, policies or implementation measures in the Stanford Community Plan. However, Stanford proposes amendments to certain figures, tables and background text in the Stanford Community Plan.

As reflected in **Figure 3-11**, Stanford requests an amendment to the Community Plan land use designation of the Driving Range Site from Campus Residential – Medium Density to Academic Campus (Figure 2.2 in the Stanford Community Plan) to better reflect existing conditions on the ground and future use of this site. Stanford also requests an amendment to the Stanford Community Plan land use designation for nine faculty houses from Academic Campus to Campus Residential – Low Density to better reflect both the existing and future use of these houses.



SOURCE: Stanford LBRE LUEP; ESA

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Figure 3-11
Proposed Changes to Land Use Designations in Stanford Community Plan

Stanford also requests certain text revisions to Sub-Strategy 1 in the Housing chapter of the Stanford Community Plan, including removing outdated references to the specific housing opportunity sites identified in this sub-strategy. Relatedly, Stanford Community Plan Figure 3.1 (Potential Housing Sites), Table 3.2 (Proposed Housing Development Potential), Table 3.3 (Planned Housing and Sites), and references to Table 3.2 and Figure 3.2 in Stanford Community Plan Policy SCP-H-2 would be deleted.

3.10 Proposed County Zoning Map Amendments

Under the proposed project, and as reflected in **Figure 3-12**, Stanford requests amendment to the County Zoning Map to change the Driving Range site from R3S (Medium-Density Campus Residential) zoning to A1 (General Use) zoning, and to change nine faculty houses from A1 to R1S (Low-Density Campus Housing).

3.11 Project Approvals

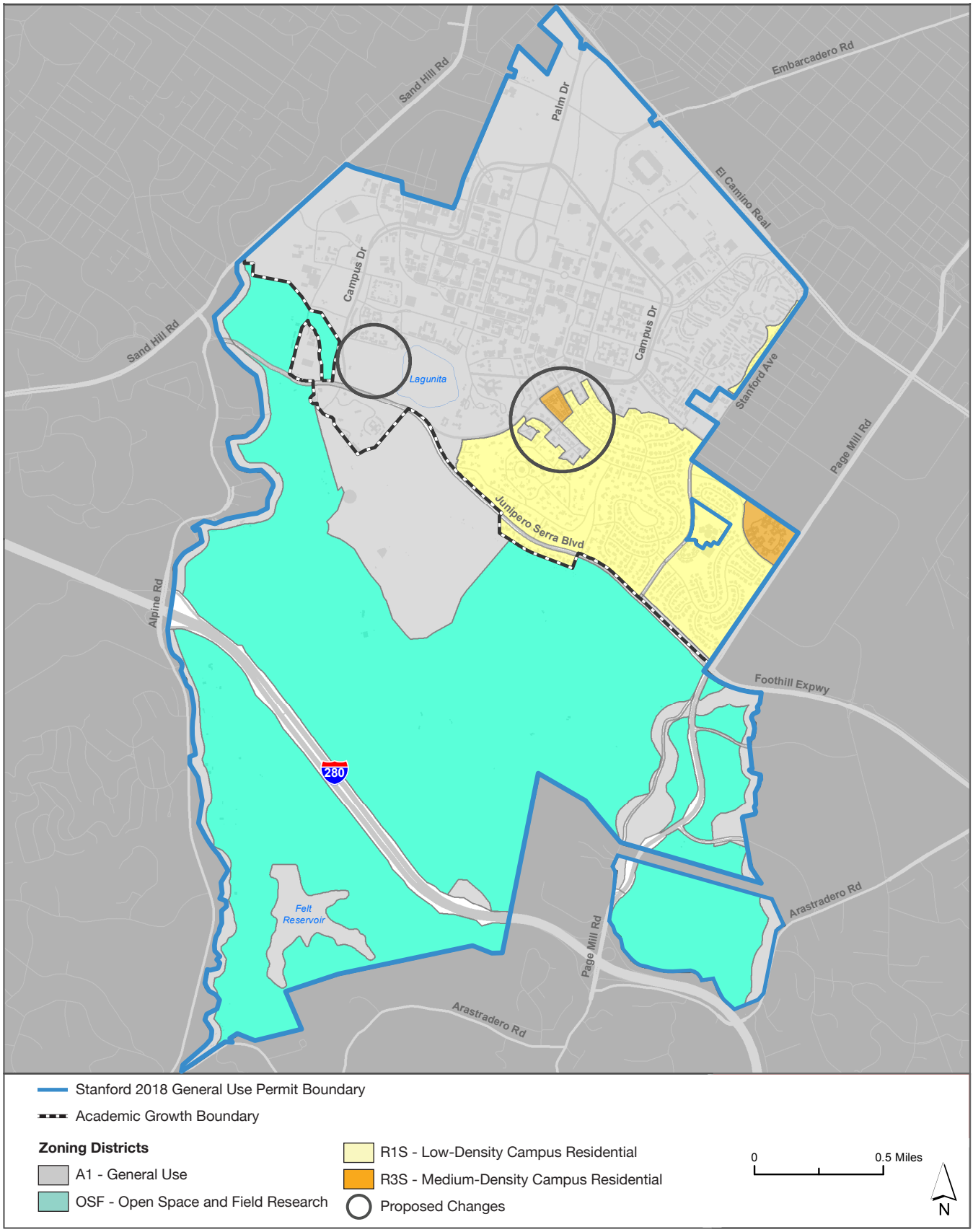
Approval and implementation of the proposed project would require the following approvals from the County:

- Certification of the 2018 General Use Permit EIR;
- Adoption of a 2018 General Use Permit;
- Approval of corresponding amendments to the County Zoning Ordinance Maps (zoning designation changes are proposed for specific parcels within the campus);
- Approval of corresponding amendments to the Stanford Community Plan component of the County General Plan, including figures, tables and text; and
- Approval of the Water Supply Assessment.

In addition to the project approvals listed above, the Board of Supervisors may consider approval of a development agreement (pursuant to Government Code Section 65864 et seq.) between the County of Santa Clara and Stanford. A public hearing on such a development agreement would be held by the Planning Commission and the Board of Supervisors per Section 5.20.230 of the County's Zoning Ordinance, and the Board of Supervisors may approve the development agreement only by ordinance.

Subsequent development activities undertaken pursuant to the 2018 General Use Permit must be consistent with the requirements of these general approvals, as well as the adopted MMRP, and will require project-specific County approvals that may include, but are not limited to, Architecture and Site Approval, grading permits, and/or building permits for specific development and infrastructure projects consistent with the 2018 General Use Permit

Full implementation of the proposed 2018 General Use Permit may require approvals from other local, state, and federal entities, including, but not limited to, the City of Palo Alto, City of East Palo Alto, City of Menlo Park, City of Los Altos, City of Mountain View, Town of Atherton,



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SOURCE: Stanford LBRE LUEP; ESA

Figure 3-12
Proposed Changes to Zoning Districts in County Zoning Map

County of San Mateo, Santa Clara Valley Transportation Authority, Santa Clara Valley Water District, San Francisco Public Utilities Commission, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Bay Area Air Quality Management District, California Department of Transportation, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish & Wildlife.

3.12 References

County of Santa Clara; *Stanford Community Plan*; adopted December 2000.

County of Santa Clara, *Planning Commission Staff Report*, File 7165-07-81-01 PAM 4 (& 7165-07-81-99P-99EIR-99GP), September 6, 2001

County of Santa Clara, Department of Planning and Development; letter to Catherine Palter, Stanford University, September 23, 2009.

County of Santa Clara, Planning Office; *Stanford University General Use Permit*; adopted December 2000, revised November 26, 2013, and May 5, 2015.

County of Santa Clara, Planning Office; *Annual Report No. 15*; June 2016.

County of Santa Clara; *Zoning Code*; as amended.

County of Santa Clara, City of Palo Alto and Stanford University; *1985 Land Use Policy Agreement*; approved 1985.

Stanford University; *Sustainable Development Study*; approved 2009.

Stanford University; *2018 General Use Permit Application*; submitted to the County of Santa Clara November 21, 2016, as amended.

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CHAPTER 4
Plan Consistency

4.1 Introduction

In accordance with CEQA Guidelines Section 15125(d), this chapter provides a discussion of any inconsistencies between the Project and applicable plans and policies of the County of Santa Clara and other local and regional agencies that have policy and regulatory jurisdiction over the Project. Although some of the plans and policies relate to regulations under the jurisdiction of these agencies, the primary discussion of regulations pertinent to the proposed 2018 General Use Permit and its environmental effects is included in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures, under the regulatory framework subsection of each environmental topic.

The proposed 2018 General Use Permit is subject to approvals by the principal agency with jurisdiction over the Project site, which is Santa Clara County. Other agencies with plans and policies applicable to the Project include the Metropolitan Transportation Commission and Association of Bay Area Governments, the Bay Area Air Quality Management District, and the San Francisco Bay Regional Water Quality Control Board.

Policy conflicts do not, in and of themselves, indicate a significant environmental effect within the context of CEQA environmental review. Many of the relevant plans contain policies that address multiple goals pertaining to different resource areas.

To the extent that physical environmental impacts of the proposed Project may conflict with one of the goals related to a specific resource topic, such impacts are analyzed in this EIR in that respective topical section in Chapter 5, such as Section 5.2 (Air Quality), Section 5.7 (Greenhouse Gas Emissions), and Section 5.9 (Hydrology and Water Quality).

4.2 Santa Clara County Plans and Policies

4.2.1 Stanford Community Plan

The Stanford Community Plan was adopted in 2000 as a component of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. It is consistent with the General Plan's principles, and refines how those principles apply to lands owned by Stanford University. The Community Plan includes seven chapters: Growth and Development, Land Use, Housing, Circulation, Open Space, Resource Conservation, and Health and Safety. The Community Plan is guided by six core principles: compact urban development;

academic growth boundary for minimum of 25 years; conservation of natural resources; housing concurrent with academic development; flexibility and accountability; and the goal of no net new commute trips.

The Academic Growth Boundary is the primary mechanism for promoting compact urban development and resource conservation on the Stanford campus and defines the allowable development for areas within and outside the Academic Growth Boundary. In general, all uses associated with the educational and residential function of the campus are directed inside the boundary (i.e., within the central campus), while areas outside the boundary (i.e., within the foothills) are reserved for open space and academic activities that require the foothill setting for their basic functioning.

Under the Community Plan the Academic Growth Boundary must remain in place until at least 2025 and until the building area of academic and support facilities and student housing reaches 17.3 million square feet. Within the first 25 years of its initial approval, the Academic Growth Boundary may only be altered with a four-fifths vote of the County Board of Supervisors. After 2025, the Academic Growth Boundary will continue to remain in place unless it is amended by majority vote of the County Board of Supervisors. To further ensure that development of Stanford lands occurs at the level of intensity that promotes compact urban development and resource conservation, the Community Plan required Stanford to prepare a Sustainable Development Study (Policy GD 12), with a view beyond the 25-year timeframe of the Academic Growth Boundary. In 2009, the County Board of Supervisors approved the Sustainable Development Study, which demonstrated that three different growth scenarios could be accommodated within the Academic Growth Boundary through the year 2035.

Stanford's development proposal under the 2018 General Use Permit reflects the principles articulated by the Sustainable Development Study and corresponds to the Moderate Growth scenario evaluated in that study. Stanford does not seek to modify the Academic Growth Boundary, or any other strategies, policies or implementation measures related to growth and development. The Project includes continued protection of habitat areas and scenic resources outside the Academic Growth Boundary and within Campus Open Space areas.

In addition, Stanford would continue to implement the 1985 Land Use Policy Agreement and its associated Protocol document, its cooperative planning agreement with the County of Santa Clara and the City of Palo Alto, described in the Regulatory Setting of Section 5.10, Land Use and Planning.

As described in Section 5.10, Land Use and Planning, Stanford proposes revisions to the Community Plan land use map to better reflect existing and future uses in two areas, but does not seek to modify any strategies, policies, or implementation measures in the Land Use Chapter. The proposed land uses described in the 2018 General Use Permit application would be consistent with the existing land use designations for Stanford lands described in the Community Plan.

The Community Plan's Housing Chapter includes policies to promote a variety of housing types, develop housing at densities that make efficient use of land and enhance affordability, and streamline housing-related permit applications. The Project proposes 3,150 net new housing units,

including 550 that would be available for faculty, staff, postdoctoral scholars, and medical residents.

The Community Plan also establishes a "linkage" policy (Policy H7) to require that new housing development occur on pace with academic development approvals on campus. The Project would apply the same housing linkage ratio as the County established in the 2000 General Use Permit. Interim milestones would be required to be met for each increment of 500,000 square feet of academic and academic support space to ensure housing construction keeps pace with academic and academic support facility development. Stanford would be required to build housing units at the rate of one unit/bed per 826 net new square feet of academic development. The 2018 General Use Permit proposes a greater number of housing units/beds (3,150) than that required by the housing linkage ratio (2,753).

The Housing Chapter further encourages and supports Stanford's provision of off-campus housing for its faculty and staff. As part of the proposed Project, Stanford has committed to continue contributing to the Stanford Affordable Housing Fund, which is maintained and distributed by the County to subsidize affordable housing in the community.

The Project would not modify any strategies, policies, or implementation measures in the Circulation Chapter. Stanford proposes to continue the plan's "No Net New Commute Trips" standard (Policy C 1). The Community Plan recognizes that if Stanford does not achieve the No Net New Commute Trips standard, Stanford must contribute to improvements at impacted intersections or provide equivalent funding toward other transportation impact mitigation efforts [Implementation Measure C(i)(9)]. Under the proposed 2018 General Use Permit, Stanford would continue to implement, and expand as needed, its transportation demand management (TDM) programs; continue to implement its off-campus trip reduction programs; and, if needed, provide funding to the County for other programs to reduce trips within a defined area.

The Project would not modify any strategies, policies, or implementation measures of the Resource Conservation or Health and Safety Chapters of the Community Plan. As noted above, to the extent that physical environmental impacts resulting from implementation of the 2018 General Use Permit may conflict with any of the goals in these chapters, such impacts are analyzed in their respective sections in Chapter 5. In conclusion, the proposed Project would not be inconsistent with policies of the Stanford Community Plan.

4.3 Regional Plans and Policies

4.3.1 Plan Bay Area

Plan Bay Area, adopted by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) in 2013, is the region's first integrated land use and transportation plan. The effort grew out of the California Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375), which required all metropolitan regions in California complete a Sustainable Communities Strategy (SCS) as part of a Regional Transportation Plan. MTC and ABAG are jointly responsible in the Bay Area for developing and adopting a SCS that

integrates transportation, land use, and housing to meet greenhouse gas (GHGs) reduction targets set by the California Air Resources Board. To accomplish the goals of the SCS, Plan Bay Area proposes to concentrate housing and job growth around transit corridors, particularly within areas identified by local jurisdictions as Priority Development Areas.

On July 26, 2017, MTC and ABAG adopted an update to the plan, Plan Bay Area 2040, which is a limited and focused update of the 2013 plan. Plan Bay Area 2040 describes where and how the region can accommodate 820,000 new projected households and 1.3 million new jobs between now and 2040 and how regional transportation investments can be used to meet this need.

Plan Bay Area 2040 includes seven goals and 13 performance targets to measure the plan's effectiveness (the goals are identical to the 2013 plan). SB 375 mandates two of these targets: 1) reduce per-capita CO_2 emissions from cars and light-duty trucks, and 2) provide sufficient housing for the entire region's projected population growth, regardless of income. Other targets are intended to meet goals regarding open space and agricultural preservation, transportation effectiveness, equitable access, economic vitality, and healthy and safe communities.

Although the Project site is not located within a Priority Development Area, the Project would not be inconsistent with the goals of Plan Bay Area 2040 described above. Development proposed under the 2018 General Use Permit would be directed to the urbanized portion of the Project site within the Academic Growth Boundary, preserving the open space and agricultural uses of the foothills.

As discussed above, under the 2018 General Use Permit, the growth of academic space would be linked to the construction of new housing units such that housing construction keeps pace with academic growth, and the amount of new housing units/beds would exceed that required by this housing linkage ratio. Regarding transportation, Stanford proposes to continue the "No Net New Commute Trips" standard established in the Stanford Community Plan. The Community Plan recognizes that achieving this standard requires a combination of approaches including increasing the supply of on-campus housing, providing convenient support services on the campus, and implementation and expansion of Stanford's transportation demand management (TDM) program. Stanford's TDM program was developed to reduce traffic-related impacts and related pollution and emissions on the campus and in the community by reducing the number of peak-hour trips and single-occupant vehicles, and boosting alternative transportation use. The TDM program includes a fare-free transit shuttle system (Marguerite buses); direct incentives to commuters who choose alternative modes; paid parking at campus lots; subsidized carpools and vanpools; subsidized transit passes; free car care memberships; and bicycle infrastructure. Under the 2018 General Use Permit, all Marguerite buses and 70 percent of Stanford Land Buildings and Real Estate (LBRE) and Bonair fleet vehicles would be electric by 2035.

Finally, the Project would continue Stanford's contributions to the County-administered Stanford Affordable Housing Fund. Stanford estimates that an estimated $56 million would be contributed to the fund over the lifetime of the 2018 General Use Permit. Stanford proposes that this contribution would support development of affordable housing within one-half mile of a major transit stop or a high-quality transit corridor as defined by SB 375, which includes fixed-route bus service with

service intervals no longer than 15 minutes during peak commute hours. Promotion of affordable housing near major transit corridors would reduce vehicle miles traveled and associated GHG emissions.

In conclusion, the proposed Project would not be inconsistent with the goals of Plan Bay Area 2040.

4.3.2 Clean Air Plan

The Bay Area Air Quality Management District adopted the 2017 Clean Air Plan (2017 CAP) in April 2017. The 2017 CAP's primary goals are to protect public health and protect the climate. The 2017 CAP includes a wide range of proposed control measures, which consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of GHGs. The 2017 CAP contains 85 measures intended to reduce emissions of several pollutants: ozone precursors, particulate matter, air toxics, and GHGs.

Development under the 2018 General Use Permit would be consistent with the applicable control measures of the 2017 CAP. The Project would provide for over 3,000 net new housing units that would reduce motor vehicle travel and associated pollutant emissions by locating students, faculty, and staff on campus. The Project would continue the "No Net New Commute Trips" standard and would implement, and expand as needed, Stanford's TDM programs; continue to implement off-campus trip reduction programs; and, if needed, require Stanford to provide funding to the County for other programs to reduce trips within a defined area. The TDM program was developed to reduce traffic-related impacts and related pollution and emissions on the campus and in the community by reducing the number of peak-hour trips and single-occupant vehicles, and also increase alternative transportation use. Furthermore, as discussed above, the Project would require that all Marguerite buses and 70 percent of its LBRE and Bonair fleet vehicles be electric by 2035.

In addition, mitigation measures described in Section 5.2, Air Quality, would reduce pollutant emissions, including offsetting emissions generated by construction and operation of the Project. Therefore, as described in detail in Section 5.2, the Project would not be inconsistent with the 2017 CAP.

4.3.3 Basin Plan

The San Francisco Bay Regional Water Quality Control Board's Water Quality Control Plan for the San Francisco Bay Basin (commonly referred to as the Basin Plan) guides water quality control planning in the San Francisco Bay Basin. Water quality objectives are achieved primarily through the establishment and enforcement of Waste Discharge Requirements for each wastewater discharger. The Basin Plan identifies beneficial uses of receiving waters, water quality objectives imposed to protect the designated beneficial uses, and strategies and schedules for achieving water quality objectives. As discussed in Section 5.9, Hydrology and Water Quality, development proposed under the 2018 General Use Permit would generate additional stormwater pollution, which could violate water quality standards. As part of the approval process for individual projects proposed under the 2018 General Use Permit, the County would require Stanford to demonstrate compliance with all applicable regulatory water quality requirements and compliance with any 2018

General Use Permit conditions regarding stormwater pollution control and management. Therefore, the Project would not be inconsistent with the Basin Plan.

4.3.4 Santa Clara Valley Urban Runoff Pollution Prevention Program

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) is an association of thirteen cities and towns in the Santa Clara Valley (including Palo Alto), Santa Clara County, and the Santa Clara Valley Water District that share a common National Pollutant Discharge Elimination System (NPDES) permit under which stormwater is discharged to South San Francisco Bay. As new development under the 2018 General Use Permit occurs, project-specific drainage plans would be designed to retain, capture, and convey increased runoff in accordance with SCVURPPP design standards and the NPDES Municipal Separate Storm Sewer System permit requirements. As discussed above in Section 4.3.3, the County would require Stanford to demonstrate compliance with applicable regulatory water quality control requirements, including with SCVURPPP; therefore the Project would not be inconsistent with this program.

CHAPTER 5
Environmental Setting, Impacts and Mitigation Measures

5.0 Introduction to Environmental Analysis

This chapter describes the environmental setting, assesses impacts, and identifies measures that would avoid or lessen the severity of impacts of the proposed 2018 General Use Permit. Section 5.0, Introduction to the Environmental Analysis outlines the issues analyzed in this chapter, describes the overall approach to the impact analysis, explains the significance determinations and terminology used in the impact analysis, and provides the basis for the cumulative impact analysis.

5.0.1 Definition of Terms Used in the EIR

This EIR uses a number of terms that have specific meaning under CEQA. Among the most important of the terms used in the EIR are those that refer to the significance of environmental impacts. The following terms to describe environmental effects of the proposed Project:

- **Significance Criteria:** The criteria used by the County of Santa Clara, as lead agency under CEQA, to determine whether the magnitude of an adverse, physical, environmental impact would be considered significant. In determining the level of significance, the analysis recognizes that the proposed Project must comply with relevant federal, state, regional and/or local regulations and ordinances which are regularly enforced through building codes and standards and/or other means.

- **Significant Impact:** An impact is considered significant if any of the proposed Project *could* result in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of a Project-related or cumulative physical change from existing or baseline conditions, compared to a specified significance criterion. A significant impact is defined as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."[1]

- **Less-than-Significant Impact:** An impact is considered less than significant when the adverse physical environmental effect caused by the proposed Project would not exceed the applicable significance criterion.

[1] CEQA Guidelines Section 15382.

- **Significant and Unavoidable Impact:** An impact is considered significant and unavoidable if it would result in a substantial adverse physical change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level, that is, to a magnitude below the applicable significance criterion.

- **Cumulative Impact:** Under CEQA, a cumulative impact refers to "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."[2] Like any other significant impact, a significant cumulative impact is one in which the cumulative adverse physical environmental effect would exceed the applicable significance criterion and the contribution of the proposed Project would be "cumulatively considerable."[3] If the contribution of the Project to a significant cumulative impact is less than considerable, the cumulative impact is considered less than significant.

- **Mitigation Measure:** A mitigation measure is a feasible action that could be taken that would avoid or reduce the magnitude of a significant impact. Section 15370 of the CEQA Guidelines defines mitigation as:

  a) Avoiding the impact altogether by not taking a certain action or parts of an action;

  b) Minimizing impacts by limiting the degree of magnitude of the action and its implementation;

  c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

  d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

  e) Compensating for the impact by replacing or providing substitute resources or environments.

- **Feasible:** Under CEQA, the term feasible means "means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."[4]

5.0.2 Scope of Analysis

The County has prepared a Program EIR to consider the environmental impacts, mitigation measures, and alternatives of the proposed 2018 General Use Permit as a whole. As described in Chapter 2, Introduction and Chapter 3, Project Description, project-specific CEQA review may be required for individual buildings or other projects that would be developed pursuant to the proposed 2018 General Use Permit. Prior to consideration of approval of any individual project, the County would examine the proposed project and determine whether the environmental effects of the specific project were fully disclosed in the 2018 General Use Permit EIR.

2 CEQA Guidelines Section 15355.
3 CEQA Guidelines Section 15130(a).
4 CEQA Guidelines Section 15364.

Analytical Horizon

This EIR evaluates the foreseeable impacts under the proposed 2018 General Use Permit through Year 2035, consistent with Stanford's planning horizon for buildout of development under the proposed 2018 General Use Permit. In the absence of any specific proposal or application by Stanford at this time for additional development beyond this planning horizon, 2035 is considered the longest feasible timeframe for analyzing potential environmental impacts in this EIR with any level of reliability. Nonetheless, the Stanford Community Plan would require discretionary review to be conducted by the County for any potential future application submitted by Stanford for development beyond 2035. As such, assessing potential environmental impacts beyond 2035 are not addressed in this EIR. See also discussion of Cumulative Impact Analysis, below.

Effects of the Environment on the Project

In a change since the certification of the 2000 General Use Permit Final EIR, the California Supreme Court recently held that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, 386. The Supreme Court explained that, where existing hazards exist, an agency is only required to analyze the potential impact of such hazards on future residents if the project would exacerbate those existing environmental hazards or conditions. Thus, with respect to such issues as geologic and seismic hazards, exposure to existing levels of air pollution and noise, and the like, CEQA does not require consideration of the effects of bringing a new population into an area where such hazards exist, as long as the project itself would not increase or otherwise affect the conditions that create those risks.

Economic and Social Effects

Under CEQA, economic and social effects by themselves are not considered to be significant impacts, and are relevant only insofar as they may serve as a link in a chain of cause and effect that may connect the proposed project with a physical environmental effect, or they may be part of the factors considered in determining the significance of a physical environmental effect.[5] In addition, economic and social factors may be considered in the determination of feasibility of a mitigation measure or an alternative to the proposed project.[6] As such, the potential effect of the Project on economic and social issues, in and of themselves, such as tax revenues, crime, the cost of public services, or property values are not part of this EIR. That being said, the County may evaluate a wide range of factors, including social or economic effects, in its consideration of the merits of the proposed Project.

5 CEQA Guidelines Section 15131.

6 CEQA Guidelines Section 15364.

Future Actions Not Addressed as Part of the 2018 General Use Permit

As indicated in Chapter 3, Project Description, the proposed 2018 General Use Permit would include conditions that would allow Stanford to request (1) additional housing beyond the proposed development limit of 3,150 housing units/beds; and/or (2) changes in the distribution of housing development within the Academic Growth Boundary. As proposed by Stanford, the 2018 General Use Permit would also include an option for Stanford to request creation of a parking reserve for up to 2,000 net new parking spaces contingent upon certain conditions being met. If and when Stanford applies for any of these requests, each request would be analyzed by the County to determine whether a supplemental or subsequent environmental impact report is required.

Furthermore, during the timeframe of the proposed 2018 General Use Permit, unforeseeable factors may cause Stanford to apply for an amendment(s) to the 2018 General Use Permit or other use permit(s) for one or more actions not presently contemplated in the 2018 General Use Permit. Given the unknown nature of such proposals, such undertakings are considered speculative.[7] However, if Stanford were to apply for an amendment to the 2018 General Use Permit or other use permits, such proposals would be analyzed by the County to determine whether a supplemental or subsequent environmental impact report is required.

5.0.3 Organization of the Impact Analysis

Chapter 5 is organized as follows and focuses on the environmental resource topics listed below:

5.1 Visual and Scenic Resources
5.2 Air Quality
5.3 Biological Resources
5.4 Cultural Resources
5.5 Energy Conservation
5.6 Geology and Soils
5.7 Greenhouse Gases
5.8 Hazards and Hazardous Materials
5.9 Hydrology and Water Quality
5.10 Land Use and Planning
5.11 Noise and Vibration
5.12 Population and Housing
5.13 Public Services
5.14 Recreation
5.15 Transportation and Traffic
5.16 Utilities and Service Systems

Each environmental topic discussion includes two main subsections:

- *Environmental Setting*, which includes a description of the existing environmental setting and baseline environmental setting, as well as a discussion of the regulatory framework, including relevant federal, State, and local laws, regulations, and policies; and

- *Impacts and Mitigation Measures*, which describes (1) significance criteria; (2) analysis methodology, (3) potential significant project-specific and cumulative impacts; and (4) potentially feasible measures that would eliminate or reduce the severity of significant project and/or cumulative impacts.

[7] CEQA Guidelines section 15145 states that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

This EIR identifies all environmental impacts with an alpha-numeric designation that corresponds to the environmental resource section number (e.g., "5.1" for Section 5.1, Visual and Scenic Resources). The section number is followed by a number that indicates the sequence in which the impact statement occurs within the section. For example, "Impact 5.1-1" would be the first (i.e., "1") aesthetic impact identified in the EIR. All impact statements are presented in bold text. The significance of the impacts prior to implementation of mitigation measures is stated in parentheses immediately following the impact statement (further discussed below).

Similarly, each mitigation measure is numbered to correspond with the impact that it addresses. Where multiple mitigation measures address a single impact, each mitigation measure is numbered sequentially. For example "Mitigation Measure 5.1-1" would be the first mitigation identified to address the first aesthetic impact (i.e., "Impact 5.1-1"). All mitigation measure statements are presented in bold text.

5.0.4 Section Structure

Each environmental resource section follows a set structure, as described below.

Introduction

This subsection summarizes the applicable topic analysis and its relevance to the proposed project.

Existing Environmental Setting

This existing environmental setting will describe the physical conditions at the time the notice of preparation (NOP) was published (January 2017).

It should be noted that this EIR relies in part on a number of technical studies prepared by Stanford in support of the 2018 General Use Permit application. The technical studies were peer reviewed by ESA and/or AECOM prior to being deemed accurate, objective, complete, and appropriate for inclusion in the EIR. These technical studies present existing conditions based on the most recent data that was available at the time of their preparation. In several of these technical reports (e.g., Air Quality Technical Report, Greenhouse Gas Technical Report, Energy Technical Report, Parks and Recreation Facilities Analysis), Fall 2015 represented existing conditions based on the most recent data that was available at the time of their preparation. In the case of the Transportation Impact Analysis, Fall 2016 represented existing conditions based on when traffic counts were conducted. Nevertheless, depending on topic and issue being addressed, and where appropriate, this EIR also presents more recent sources of information to characterize existing conditions, where available.

However, as described under Baseline Environmental Setting, below, conditions expected to exist at approval and first year of implementation of the 2018 General Use Permit will serve as the baseline against which environmental impacts of the Project will be evaluated.

2018 Baseline Environmental Setting

The baseline environmental setting describes the conditions that exist prior to implementation of the Project. For this EIR, the baseline environmental setting provides the point of reference for assessing the environmental impacts of the proposed Project and Project alternatives.

For purposes of assessing the environmental effects of a proposed project, CEQA Guidelines Section 15126.2 states, "the Lead Agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published." See also, CEQA Guidelines Section 15125(a). In *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal. 4th 439, 452-453, the California Supreme Court explained that CEQA does not impose a uniform, inflexible rule for establishing an existing conditions baseline, but rather gives lead agencies discretion. This includes the discretion to establish a baseline based on conditions expected to occur in the future where doing so "promotes public participation and informed decisionmaking by providing a more accurate picture of a proposed project's likely impacts." (*Id*. at p. 453.) The Court highlighted the situation where a change in environmental conditions is expected to occur before project implementation. (*Id*. at p. 452.) In this situation, defining the baseline in terms of the conditions at project commencement, rather than at the commencement of the environmental review, is a proper exercise of agency discretion.

In the case of this Project, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence if the permit is approved. For purposes of this EIR, the County established 2018 as the baseline environmental setting to coincide with the approval and first year of implementation of the 2018 General Use Permit. Accordingly, 2018 serves as the baseline year against which environmental impacts of the Project are evaluated.

Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time the County considers approval of the proposed 2018 General Use Permit. Stanford anticipates that completion of the Escondido Village (EV) Graduate Residences will extend beyond 2018, with occupancy occurring by 2020. As discussed above, this EIR relies in part on a number of technical studies that used existing conditions data that predated the publication of the NOP. In each of these technical studies, and depending on the issue being addressed and geographic study area considered, appropriate growth factors and extrapolations were used; and/or adjustments made to consider specific reasonably foreseeable near-term projects, to establish the 2018 environmental baseline. The 2018 environmental baseline generally accounts for all applicable cumulative development and infrastructure in the study area anticipated to be under construction, and/or built and occupied by 2018. Please refer to the individual impact sections in this EIR, and associated supporting technical studies included in the EIR appendices, for detailed explanations on the methodologies used for developing the 2018 environmental baseline for each environmental topic.

For informational purposes, **Appendix CON**, Table 1, presents a list describing notable individual Stanford building construction projects within the Project site that were either completed since release of the NOP in January 2017, or for which construction is either currently

underway or starting soon and expected to be largely completed by Fall 2018. All these projects are located within Stanford's Academic Growth Boundary. As applicable, these developments have been approved or are pending approval from the County through its Architecture and Site Approval process. One exception is the planned EV Graduate Residences, which was approved by the County in 2016 and is currently under construction, but for which the housing would not be completed and occupied at the time of approval of the 2018 General Use Permit. This housing project is anticipated to be fully completed and occupied by 2020.This EIR considers the EV Graduate Residences project in different contexts, depending on when impacts associated with it would occur. Since construction-related site disturbance for the EV Graduate Residences project is currently underway, any footprint- and construction-related environmental impacts of this housing project are included in the 2018 environmental baseline. However, since the EV Graduate Residences will not be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline. However, the on-campus population that will be associated with the EV Graduate Residences once occupied, and the correlating operational-related environmental effects, are appropriately accounted for in the context of the 2035 cumulative scenario.

In addition, **Appendix CON**, Table 2 provides an overview of notable near-term cumulative building projects within the Project site vicinity that were either completed since release of the NOP, or for which construction is either currently underway or anticipated to begin prior to Fall 2018. The subsection for each environmental topic in this Chapter 5.0 provides additional detail on other applicable 2018 environmental baseline characteristics relevant to the topic being analyzed.

Regulatory Setting

The regulatory setting presents relevant information about federal, state, regional, and/or local laws, regulations, ordinances, plans, policies and standards that pertain to the environmental resources addressed in each section.

Significance Criteria

According to CEQA Guidelines Section 15382, a significant effect on the environment means "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." Significance criteria are identified for each environmental issue area in each resource section evaluation. For this Project, the environmental criteria and considerations applied to determine the significance of Project-related changes in the environment are based on the CEQA Guidelines Appendix G and criteria adopted by the County in the *Environmental Checklist and Evaluation for Santa Clara County*. The significance criteria serve as benchmarks for determining if proposed activities or conditions would result in a significant adverse environmental impact when evaluated against the environmental baseline.

Approach to Analysis

Each section describes the analytical methods and key assumptions used to evaluate effects of the proposed Project.

Impacts and Mitigation Measures

The EIR evaluates the environmental consequences and potentially significant impacts that would result from implementation of the proposed Project. The impacts identified are compared with predetermined significance criteria (discussed above), and classified according to significance categories listed below.

The proposed 2018 General Use Permit would include a number of enforceable conditions intended to avoid or lessen the severity of certain environmental effects that would result from construction and operation of the Project. Similarly, the Stanford Community Plan includes a number of mitigating policies and standards, some of which are codified in the County of Santa Clara Ordinance Code. In the impact analysis for each environmental topic, the EIR acknowledges the specific mechanism from the proposed 2018 General Use Permit, Stanford Community Plan, County of Santa Clara Ordinance Code, and/or other enforceable laws or regulations that would ensure a potential significant environmental impact associated with implementation of the 2018 General Use Permit would be lessened or avoided.

To the extent the residual impact may still be significant even after implementation of the conditions, laws and regulations, potentially feasible mitigation measures are described which would eliminate or substantially reduce the severity of the impact. The effectiveness of a mitigation measure is determined by evaluating the residual impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after potentially feasible mitigation measures are incorporated are identified as residual impacts that remain significant and unavoidable. Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance.

Cumulative Impact Analysis

An analysis of cumulative impacts follows the Project-specific impacts and mitigation measures evaluation in each section. A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other past, present and reasonably foreseeable projects causing related impacts.[8]

The cumulative impact analysis in each technical section includes a description of the cumulative analysis methodology and the geographic or temporal context in which the cumulative impact is analyzed (e.g., the County of Santa Clara, the Bay Area Air Basin, other activity concurrent with Project construction). In some instances a project-specific impact may be considered less than significant, but when considered in conjunction with other cumulative projects or activities may be considered significant or potentially significant.

As noted above, where a cumulative impact is significant when compared to baseline conditions, the analysis must address whether the Project's contribution to the significant cumulative impact is "considerable." If the contribution of the Project is considerable, then the EIR must identify

8 CEQA Guidelines Section 15355.

potentially feasible measures that could avoid or reduce the magnitude of the Project's contribution to a less-than-considerable level. If the Project's contribution is not considerable, it is considered less than significant and no mitigation of the Project contribution is required.[9]

[9] CEQA Guidelines Section 15130(a)(3).

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5.1 Visual and Scenic Resources

5.1.1 Introduction

This section describes the visual and scenic resources on the Project site and addresses the potential for adverse impacts to those resources as a result of construction activities and campus operations under the proposed 2018 General Use Permit. This section includes a description of the existing and 2018 baseline environmental settings related to visual and scenic resources of the Project site, and presents a discussion of applicable federal, State, and County regulations. The potential for implementation of the proposed 2018 General Use Permit to result in adverse effects to scenic vistas, scenic highways, visual character and quality, or create new light or glare is evaluated. This section then identifies regulatory mechanisms and/or feasible mitigation measures, as necessary, to reduce potential impacts associated with visual and scenic resources.

5.1.2 Existing Environmental Setting

The 4,017-acre Project site consists of the central campus located between El Camino Real, Sand Hill Road, Junipero Serra Boulevard, Stanford Avenue and Page Mill Road; and the largely undeveloped foothills south of Junipero Serra Boulevard located east of Los Trancos Creek and west of Deer Creek (see Chapter 3, **Figure 3-3**).

Stanford's central campus includes its academic facilities and housing, and is located entirely within the Academic Growth Boundary. As shown in **Figure 3-4** in Chapter 3, Stanford's developed academic core is located mostly within the Campus Drive ring road. The central campus academic area is characterized by short buildings (mostly four stories or less) with sandstone exteriors and red tiled roofs, interspersed with numerous plazas, courtyards, fountains, pathways, and ornamental landscaped areas. Academic buildings are arranged on a formal rectangular pattern based on the master plan designed by Frederick Law Olmsted. The Main Quadrangle (Quad) is centered on a north-south axis with the mile-long Palm Drive extending north from the Oval to El Camino Real. The rectangular plan of the Main Quad was designed to provide for expansion through a series of quadrangles developed on an east-west axis.

Areas surrounding the academic core include the 126-acre Arboretum open space area, which is dominated by oak and eucalyptus trees trimmed to maintain line of sight, and nonnative grasses in the understory mowed for fire safety; Stanford Stadium, which is partly below ground level and screened by surrounding vegetation; several natural and synthetic turf athletic fields interspersed with vegetation and athletic facilities (e.g., Maples Pavilion and the Taube Family Tennis Stadium), located southwest of the Stadium and along El Camino Real; multiple-unit graduate student housing complexes in Escondido Village, including many small 2-story buildings, larger 3-4 story buildings, and seven towers up to 12-stories tall; and single-family faculty/staff housing in the San Juan Development District.

The Stanford foothills are undeveloped for the most part and consist of low, rolling hills generally 200 to nearly 500 feet in elevation, and consist of a mix of nonnative and native grasslands, oak woodland, and riparian areas. Individual oak trees or small, open-canopied groupings of oaks

occur within the grassland areas. Riparian woodland is located along Matadero Creek, Deer Creek, and the creeks in the San Francisquito watershed. Vegetation along the creeks consists primarily of a moderately closed canopy of oak and California buckeye. Small clumps of native and nonnative grasses are present in the understory of the riparian woodland. Chaparral and scrub are also present in the foothills. The Felt Reservoir is located in the southwestern portion of the foothills. Other water features include several artificial ephemeral ponds and some small semi-natural seasonal pools. The radio telescope ("the Dish") is the most prominent structure in the foothills due to its size and location along the ridgeline. Most of the Stanford Golf Course is located in the foothills.

Figure 5.1-1, *Existing Views of Central Campus*, shows views of the existing buildings and landscape as seen from Stanford's Hoover Tower, shown from an aerial photograph in the upper left image. The upper right image in Figure 5.1-1 is a view looking south from Hoover Tower across the central campus showing various Stanford academic and residential uses, beyond which are the Stanford foothills, with the Dish visible on the ridgeline in the distance. The lower left image in Figure 5.1-1 looks north from Hoover Tower across the central campus, with Memorial Hall in the foreground, behind which are the Frost Amphitheater and Bing Concert Hall, and off-site in the distance, development in Palo Alto. The lower right image in Figure 5.1-1 is a view looking west from Hoover Tower across the central campus, and shows portions of the Main Quad and the Oval in the foreground, behind which are several campus science buildings, and beyond and off-site are Stanford Hospital and other development in Palo Alto and/or Menlo Park.

Figure 5.1-2, *Photo Viewpoint Locations*, shows the locations of photographs depicting existing views of the Stanford central campus from multiple public vantage points just outside the Project site boundary. Viewpoints (VP) 1 and 2 on **Figure 5.1-3** show views along Stanford Avenue from the College Terrace residential neighborhood in the City of Palo Alto. VP 3 and VP 4 show views from El Camino Real at Serra Street and Galvez Street, respectively. **Figure 5.1-4** includes additional views from El Camino Real along with views from Quarry Road and Sand Hill Road.

Long-range scenic views from Stanford lands within the central campus are generally limited due to the relatively flat topography of the central campus, as well from intervening obstructions from both the built and natural environment. Partial views of the Stanford foothills and the Santa Cruz Mountains to the south and west are available from certain vantage points within the central campus; however, these are effectively screened by existing buildings and vegetation from many locations. Stanford's Lathrop Development District is at a higher elevation than the rest of the developed campus due to its location in the foothills. Consequently, long-range views of the San Francisco Bay, and the East Bay Hills beyond, are visible from certain locations within this development district, although restricted in part by existing trees.

In contrast, Stanford's Foothills Development District affords more opportunities for open, long-range and scenic views in all directions, particularly from certain ridgetop locations, given the higher elevation and largely undeveloped nature this area of the Project site.

Views from State scenic highways are discussed below in Section 5.1.4, Regulatory Setting.



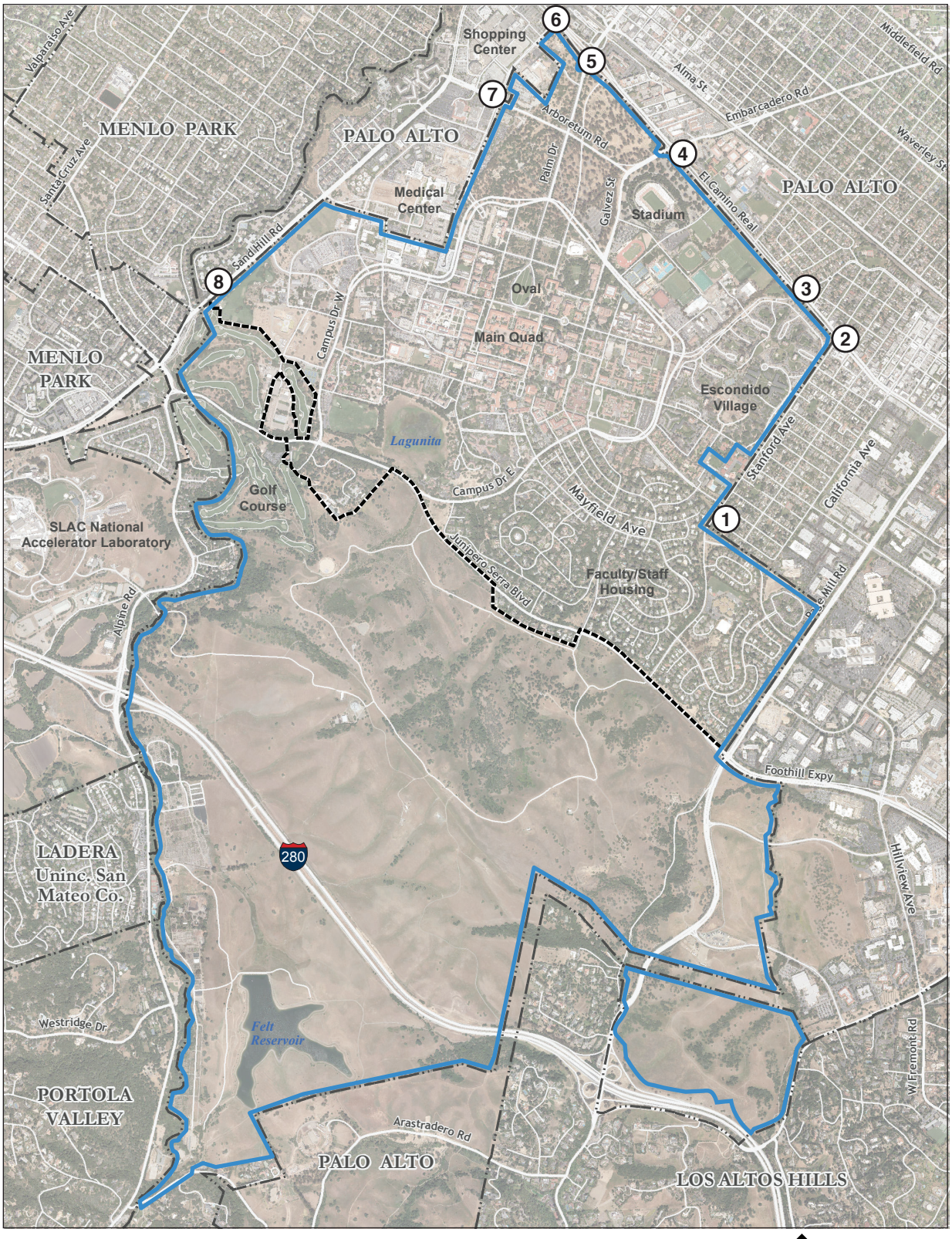






SOURCE: Stanford University; ESA

Figure 5.1-1
Existing Views of Central Campus



SOURCE: Stanford LRBE LUEP, ESA

Stanford 2018 General Use Permit . 160531

Figure 5.1-2
Photo Viewpoint Locations



VP 1, Stanford Avenue and Bowdoin Street



VP 2, Stanford Avenue and El Camino Real



VP 3, El Camino Real and Serra Street



VP 4, El Camino Real and Galvez Street

SOURCE: ESA

Figure 5.1-3
Existing Views of Project Site (Viewpoints 1 – 4)



VP 5, El Camino Real and Palm Drive



VP 6, El Camino Real and Quarry Road



VP 7, Quarry Road and Arboretum Road



VP 8, Sand Hill Road and Oak Creek Apartments

SOURCE: ESA

Figure 5.1-4
Existing Views of Project Site (Viewpoints 5 – 8)

5.1.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development and remaining housing authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the proposed 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences project, which is currently under construction; this housing is not expected to completed and occupied until 2020. All remaining academic and academic support and housing development to be built under the 2000 General Use Permit, including the EV Graduate Residences, are located within Stanford's Academic Growth Boundary. As applicable, these developments have completed or are pending approval from the County through its Architecture and Site Approval process. Accordingly, the visual changes associated with these developments are considered as part of the 2018 environmental baseline. Similarly, the 2018 environmental baseline also includes all other applicable approved cumulative development and infrastructure in the study area anticipated to be built and occupied by 2018.

5.1.4 Regulatory Setting

Federal

There are no relevant federal regulations regarding visual and scenic resources applicable to the proposed Project. State and County of Santa Clara regulations are described below.

State

California Department of Transportation Scenic Highway Program

California's Scenic Highway Program was created by the state Legislature in 1963 with the purpose to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The State Scenic Highway System includes highways that are either eligible for designation as scenic highways, or have been designated as such. The status of a state scenic highway changes from eligible to officially-designated when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives the designation. While local jurisdictions may propose adding routes with outstanding scenic elements to the list of eligible highways, state legislation is required for them to become officially designated. Interstate 280, which traverses the Stanford foothills, is designated as an Eligible State Scenic Highway by Caltrans (Caltrans, 2017).

County of Santa Clara

County of Santa Clara Ordinance Code

Architecture and Site Approval (ASA)

ASA is a procedure established by the County of Santa Clara Zoning Ordinance Chapter 5.40 to "maintain the character and integrity of zoning districts by promoting quality development in harmony with the surrounding area, through consideration of all aspects of site configuration and design." ASA is a discretionary permit that the County issues for most new building and certain reconstruction and remodeling projects and utilizes the County's ASA Guidelines. In December 2016, ASA functions were consolidated under the County Zoning Administrator. The ASA review process primarily considers site planning, massing, and overall design character issues, not detailed elevations or construction drawings. Stanford General Use Permit conditions must be met on each individual project that is approved under the General Use Permit. The County maintains discretion to modify its approval/permitting procedures.

Santa Clara County General Plan

The Santa Clara County General Plan includes strategies, policies, and maps that address visual and scenic resources. The General Plan *Regional Parks and Scenic Highways* map identifies "State Scenic Routes" and "Scenic Freeways, Expressways, Arterial, and Rural Routes." Two roads shown on the map cross Stanford lands within the boundary of the Project site: Junipero Serra Road Boulevard and Page Mill Road.

The following strategies and policies regarding Scenic Highways included in the Parks and Recreation chapter of the Santa Clara County General Plan are relevant to visual and scenic resources.

Strategy #2: Protect Scenic Highway Corridors

Policy C-PR 37 **–** The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty.

Policy C-PR 38 **–** Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor.

Policy C-PR 41 **–** Signs should be strictly regulated, with off-site signs and billboards prohibited along scenic routes.

Policy C-PR 42 **–** Access and commercial development along scenic expressways should be limited to prevent strip commercial development.

Policy C-PR 43 **–** New structures should be located where they will not have a negative impact on the scenic quality of the area, and in rural areas they should generally be set back at least 100 feet from scenic roads and highways to minimize their visual impact.

Policy C-PR 44 **–** Landscaping with drought-resistant native plants should be encouraged adjacent to scenic roads and highways.

Policy C-PR 45 – Activities along scenic highways that are of a substantially unsightly nature, such as equipment storage or maintenance, fuel tanks, refuse storage or processing and service yards, should be screened from view.

The following strategies and policies regarding Scenic Resources included in the Resource Conservation chapter of the Santa Clara County General Plan are relevant to visual and scenic resources:

Strategy #1: Manage Growth and Plan for Open Space.

Policy C-RC 59 – Scenic values of the natural resources of Santa Clara County should be maintained and enhanced through countywide growth management and open space planning.

Strategy #2: Minimize Development Impacts on Significant Scenic Resources.

Policy C-RC 60 – Hillsides, ridgelines, scenic transportation corridors, major county entryways, and other areas designated as being of special scenic significance should receive additional consideration and protections due to their prominence, visibility, or symbolic value.

Policy C-RC 61 – Public and private development and infrastructure located in areas of special scenic significance should not create major, lasting adverse visual impacts.

Strategy #3: Maintain and Enhance the Scenic Values of Urban Settings.

Policy C-RC 62 – Urban parks and open spaces, civic places, and public commons areas should be designed, developed and maintained such that the aesthetic qualities of urban settings are preserved and urban livability is enhanced. Natural resource features and functions within the urban environment should also be enhanced.

Stanford Community Plan

The Stanford Community Plan is a component of the County of Santa Clara General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The following strategies and policies in the Stanford Community Plan are relevant to visual and scenic resources:

Strategy #9: Employ Growth and Development Policies That Conserve Scenic Resources.

Policy SCP-RC 27 – Protect the scenic and aesthetic qualities of the natural setting of Stanford lands in the County by means of appropriate land use designations, growth management tools, and careful review of individual development projects.

Policy SCP-RC 28 – Emphasize development within the Academic Growth Boundary.

Policy SCP-RC 29 – Ensure adequate screening and reduction of visual impacts of any development in designated open space areas through the development review process.

Strategy #10: Maintain and Enhance the Scenic Values of Urbanized Area Settings.

Policy SCP-RC 30 – Preserve and enhance attractive, scenic urban settings on the Stanford campus and within Stanford's residential areas.

Policy SCP-RC 31 – Preserve significant historic landscape elements within the fabric of the campus' architecture and design.

Policy SCP-RC 32 – Maintain elements of the native landscape in Campus Open Space areas and throughout the developed portion of the campus.

Policy SCP-RC 33 – Maintain sign standards to ensure that signs are harmonious with the character of scenic area.

County of Santa Clara Zoning Ordinance

The County of Santa Clara Zoning Ordinance implements the Santa Clara County General Plan, and regulates land use and development within the unincorporated areas of Santa Clara County. The current County zoning districts on Stanford lands are illustrated in **Figure 3-7** in Chapter 3, Project Description. Zoning districts include General Use (A1); Low-Density Campus Residential (R1S); Medium-Density Campus Residential (R3S); and Open Space and Field Research (OS/F). In the A1 and R1S districts, the maximum building height for residential uses is 35 feet. However, in the A1 district, the Zoning Administrator has the authority to determine height limits (with limitations pertaining to setback requirements) for non-residential uses and residential uses subject to ASA (Zoning Ordinance Sections 2.30.030 and 2.50.030). In the RS3 district, the maximum building height for projects subject to ASA is determined by the Zoning Administrator, as is the case for projects in the OS/F district (Zoning Ordinance Section 2.50.030).

Any proposed development within the OS/F district that requires ASA is also subject to a viewshed analysis and methodology described in Santa Clara County Zoning Code Section 2.50.040. In addition, Santa Clara County Planning Commission approval is needed for buildings and structures over 1,000 square feet as well as towers and antenna over 35 feet tall that are located in a high visibility zone or corridor.

Plan for the El Camino Real Frontage

Stanford's unincorporated lands stretch for approximately 1.5 miles along El Camino Real, from Quarry Road to Stanford Avenue. The 2000 General Use Permit included Condition of Approval L.1 requiring that Stanford submit a streetscape design for unincorporated Stanford lands along the south side of El Camino Real prior to or in connection with submitting an application for any development along this roadway. Stanford completed the *Plan for the El Camino Real Frontage* in 2007 and it received ASA approval in 2008. This plan addresses building setbacks, building heights, land use, and vegetation/landscape character for Stanford property along El Camino Real (Stanford, 2008).

5.1.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on visual and scenic resources if it would:

a) Have a substantial adverse effect on a scenic vista;

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) Substantially degrade the existing visual character or quality of the site and its surroundings; or

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Approach to Analysis

The examination of visual and scenic resource impacts is based on information obtained from the 2018 General Use Permit application and review of documents pertaining to aesthetics and visual resources published by the County and Stanford University. ESA staff also conducted a site visit to document existing visual conditions of the Project site and viewpoints of the Project from public areas adjacent to the 2018 General Use Permit boundary. In general, views from public vantage points outside the Project site boundary are emphasized. The County retains discretion through the ASA process to evaluate visual effects associated with changes on the Project site. The visual impact assessment provides a description of the physical setting of the Project site to illustrate the backdrop against which impacts regarding scenic vistas, state scenic highways, visual character and quality, and light and glare effects of the proposed Project are evaluated. For each potential impact, the analysis compares the impact to the standards of significance listed above and determines the impact's level of significance under CEQA.

Impact Evaluation

Impact 5.1-1: The Project would not adversely affect scenic vistas. (*Less than Significant*)

For the purposes of this evaluation, a scenic vista is defined as a distant public view along or through an opening or corridor that is recognized and valued for its scenic quality. The Santa Clara County General Plan considers the undeveloped hillsides and ridgelines visible from the Santa Clara Valley floor as valuable scenic resources (Policy C-RC 60). The Stanford Community Plan similarly recognizes the scenic and aesthetic quality of the natural setting of Stanford lands in the County (Policy RC 27). However, specific scenic vistas from Stanford lands within the 2018 General Use Permit boundary are not identified by either plan. As noted in the Environmental Setting, scenic views from the central campus of the Stanford foothills and Santa Cruz Mountains beyond are limited due to the flat topography, intervening buildings, and landscape vegetation. Views of the East Bay Hills and San Francisco Bay from the central campus are similarly restricted due to existing mature vegetation. The Stanford's Foothills Development District provides the greatest opportunities for open, long-range and scenic views in all directions, particularly from certain ridgetop locations.

While no site-specific projects have been identified for development under the proposed 2018 General Use Permit, no new building square footage or housing would be constructed in the Foothills Development District under the proposed Project. Therefore, the existing scenic vistas from the Stanford foothills would remain unchanged under the Project. Development proposed by

the Project within the Academic Growth Boundary would inevitably block certain views of the foothills from areas immediately adjacent to new buildings. However, views are already greatly reduced due to existing development and the extensive landscaping on the campus. The potential loss of certain limited views of the foothills and Santa Cruz Mountains due to individual development projects constructed under the Project would not significantly diminish the key scenic vistas from these areas from the campus; therefore, the impact would be less than significant.

Mitigation: None required.

Impact 5.1-2: The Project could damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. (*Less than Significant*)

Development under the 2018 General Use Permit would not occur within or adjacent to any officially Designated State Scenic Highway. Interstate 280 (I-280), which crosses the Stanford foothills, is designated as an Eligible State Scenic Highway by Caltrans, but has never been officially designated as such. In addition, Junipero Serra Boulevard and Page Mill Road, certain segments of which either cross or border the foothills, are identified as scenic roads by the Santa Clara County General Plan. While Stanford proposes no new development in the Foothills Development District, under the 2018 General Use Permit it is possible that some infrastructure improvements such as pathways, underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, and similar types of improvements could be constructed in this district.

Most of the Foothills Development District is subject to a scenic roads zoning overlay (Zoning Ordinance Chapter 3.30) that protects the visual character of scenic roads through special development and sign regulations. Development along Junipero Serra Boulevard and Page Mill Road also would be subject to the scenic roads overlay (Section 3.30.050). Under Section 3.30.030 of the Scenic Roads Combining District, any proposed structure, including signs, located within 100 feet of the right-of-way of a designated scenic roadway would be subject to design review, as described in Chapter 5.50 of the Zoning Ordinance. Some structures may be eligible for exemption from design review per Chapter 5.50. The cumulative construction of multiple exempt projects on a lot may, at the discretion of the Zoning Administrator, be subject to design review, based on the characteristics and visibility of the property, the potential visual impact of the buildings or structures, and any other relevant considerations as defined in Section 5.50.040 of the ordinance. Therefore, damage to scenic resources occurring as a result of potential infrastructure projects constructed in the vicinity of I-280, Junipero Serra Boulevard, or Page Mill Road would be reduced to a less-than-significant level through compliance with the County's scenic roads overlay regulations.

Mitigation: None required.

Impact 5.1-3: The Project could degrade the existing visual character or quality of the site and its surroundings. (*Less than Significant*)

New development and most infrastructure subject to the proposed 2018 General Use Permit would be constructed on vacant land, infill sites, and redevelopment sites within the Academic Growth Boundary, as shown in **Figure 3-8** in Chapter 3. Although no site-specific projects and locations have been identified for development under the proposed 2018 General Use Permit, based on the proposed development distribution by Stanford development district, the potential effects on visual character or quality are described below. The proposed 2018 General Use Permit would identify maximum allowable development within each Development District, which Stanford may request modification to during the 2018 General Use Permit cycle.

East Campus Development District

Proposed development in the East Campus Development District includes 1,600 new housing units and 20,000 square feet of academic and academic support space. Figure 5.1-3 shows views of the East Campus area from public areas adjacent to the Project site boundary in the City of Palo Alto. Viewpoint 1 shows a view from the intersection of Stanford Avenue and Bowdoin Street. Views of existing buildings on the campus are almost entirely screened from this vantage point due to existing trees. Viewpoint 2 shows two-story residential homes constructed as part of the Olmsted Road staff housing at the corner of Stanford Avenue and El Camino Real. Viewpoint 3 is a view looking from El Camino Real southwest along Serra Street. Small portions of Stanford graduate student housing are visible through the existing vegetation. New housing proposed for the East Campus Development District would not change the existing visual character of this portion of the Project site. This area is almost entirely developed with existing graduate and undergraduate housing, of varying building types and sizes. The amount of academic and academic support space proposed would not alter the overall residential nature of this development district. As shown on Figure 5.1-3, views of the interior portion of this development district, and thus possible building sites, would largely be hidden from public vantage points adjacent to the district. In addition, new buildings would likely not be constructed along Stanford Avenue or El Camino Real, as those areas were recently developed with new faculty and staff housing.

DAPER and Administrative Development District

Up to 200,000 square feet of academic and academic support space are proposed in the DAPER and Administrative Development District. No housing currently exists in this development district and none would be constructed under the Project. Proposed development in this district would not affect the existing visual character of this area if new buildings are constructed in the interior portions of the site, i.e., along Campus Drive and Serra Street, which is currently occupied by several short administrative buildings, surface parking lots, and the Stanford Corporation Yard. Development on the existing athletic fields or the open area known as Masters Grove would diminish the relatively open quality of this district, and would be especially noticeable from off-site public vantage points if buildings are constructed in the fields adjacent to or nearby El Camino Real. The land within 100 feet of the El Camino Real right-of-way, from Quarry Road to Stanford Avenue, is subject to the County-approved *Plan for the El Camino Real Frontage*.

The plan requires that buildings in the DAPER and Administrative Development District must be set back 20 feet from the property line along El Camino Real and building heights can be no taller than a maximum of 50 feet, which is compatible with development on the Stanford campus and City of Palo Alto properties on the opposite side of El Camino Real. Compliance with the plan would ensure that development within the DAPER and Administrative Development District would be consistent with the adjacent developed areas. The area between Stanford Stadium and El Camino Real is designated as Campus Open Space. As shown in Viewpoint 4 in Figure 5.1-3, the stadium is completely screened by existing vegetation from this vantage point. No new permanent, above-ground buildings or structures for occupancy are permitted within this area; therefore, this portion of the development district would retain its existing visual character.

Arboretum Development District

Figure 5.1-4, Viewpoint 5, shows the classic entrance to Stanford through the Arboretum along Palm Drive. Two large stone and red-tiled monuments flank Palm Drive here and signify the entrance to the University. Memorial Church on the Main Quad is barely visible in the distance. No development is proposed in the Arboretum Development District by the Project, so no change to the visual character or quality of this area of the campus would occur.

Quarry Development District

The Quarry Development District is proposed to include up to 550 high-density housing units and 200,000 square feet of academic and academic support space. This development district consists of two separate areas between Quarry Road and the Arboretum. The portion that borders El Camino Real, shown on Viewpoint 6 of Figure 5.1-4, is currently used as a staging yard for construction materials and equipment by Stanford, although this is mostly screened by existing vegetation. The roof of Hoover Pavilion, which is not on the Project site, is visible in this image. The second portion is a narrow, triangular area south of the Hoover Pavilion that is bisected by Arboretum Road. Viewpoint 7 shows a surface parking lot and Bank of America building barely visible on the far right of the photo. This building is not on the Project site. The southern portion of the triangular property (south of Arboretum Road) includes an existing Stanford Psychiatry building at the corner of Arboretum Road and Quarry Road and more surface parking.

The Quarry Development District is unique among the development districts in that it is completely separated from the rest of the campus by the largely undeveloped Arboretum. As a result, this area is tied strongly to other Stanford lands outside the Project site, i.e., the Hoover Pavilion parcel and areas across Quarry Road. New housing and academic and academic support space proposed for this area would alter the visual character of this development district by adding buildings in undeveloped areas (staging yard) and on surface parking lots. These new buildings would, however, extend the urbanized landscape that exists directly across Quarry Road from the development district.

West Campus Development District

Viewpoint 8 of Figure 5.1-4 shows the West Campus Development District from the intersection of Sand Hill Road and the Oak Creek Apartments entrance. Existing trees screen views of the Siebel Varsity Golf Training Complex from this viewpoint. Proposed development in the West

Campus includes 35,000 square feet of academic and academic support space. No housing currently exists in this development district and none would be constructed under the proposed Project. The portion of this development district along Sand Hill Road is almost entirely devoid of buildings or structures and includes the Sand Hill Athletic Fields in addition to the golf training complex. The relatively small amount of academic and academic support space proposed for this development district would not substantially change the visual character of the area. Stanford also would not construct new buildings along a narrow strip of Campus Open Space designated land along Campus Drive near its intersection with Junipero Serra Boulevard or in the similarly-designated Palo Alto Stock Farm Stable area ("Red Barn").

Lagunita Development District

The Lagunita Development District is proposed to include up to 800 housing units and 20,000 square feet of academic and academic support space. Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project, which includes the area bordering the Lagunita itself and a strip of land extending west along Junipero Serra Boulevard to Campus Drive. Due to its location on the campus, any proposed development in this development district would not likely be visible from public vantage points beyond the 2018 General Use Permit boundary. The Lagunita Development District is almost entirely devoted to student housing and ancillary facilities. Proposed housing and the small amount of academic and academic support space would not change the visual character of this area.

Lathrop Development District

Proposed development in the Lathrop Development District includes 20,000 square feet of academic and academic support space. No housing currently exists in this development district and none would be constructed under the Project. This development district is distinct from others within the Academic Growth Boundary due to its location in the foothills and the relatively dense vegetation that covers much of the area. The few existing buildings in this district are generally hidden from other areas of the campus. Although this development district is much smaller than most of the other development districts, the minor amount of proposed academic and academic support space would not change the visual character of the district if sited appropriately. Potential building sites would be further limited by the steep incline along Junipero Serra Boulevard.

Campus Center Development District

Nearly 80 percent of the anticipated academic and academic support space proposed under the 2018 General Use Permit would occur in the Campus Center Development District. Proposed development includes 1,800,000 square feet of academic and academic support space and 200 housing units. The Oval and areas along Palm Drive within the Campus Center Development District are designated as Campus Open Space. Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project. The large amount of building space proposed for this development district is consistent with Stanford's long-standing policy of intensifying development within the academic core. Proposed development would not substantially change the existing visual character of this development district.

San Juan and Foothills Development Districts

Stanford proposes no new building square footage or housing in the San Juan or Foothills Development Districts. However, various infrastructure improvements could be constructed in these districts as well as throughout the lands subject to the proposed 2018 General Use Permit. Most of the Foothills Development District is zoned as Open Space and Field Research (OS/F). Any proposed development within the OS/F district that requires ASA is also subject to a viewshed analysis and methodology described in Santa Clara County Zoning Code Section 2.50.040. In addition, Santa Clara County Planning Commission approval is needed for buildings and structures over 1,000 square feet as well as towers and antenna over 35 feet tall that are located in a high-visibility zone or corridor.

Summary

As described above, development proposed under the 2018 General Use Permit would be consistent with the overall aesthetic and scenic polices of the Stanford Community Plan by directing growth to appropriate land use designations (Policy RC 27) and by limiting growth to areas within the Academic Growth Boundary (Policy RC 28). Within the boundary, no development would occur on scenic areas of the campus that are designated as Campus Open Space, including the Arboretum, the Oval and areas adjacent to Palm Drive, and Lagunita.

While no site-specific projects or locations have been identified, each individual building or project that would be developed pursuant to the proposed 2018 General Use Permit would require submittal of an application to the County at the time proposed to determine if the project would require review under the County's ASA process. ASA currently is required for new construction, reconstruction, relocation, and remodeling of academic structures and multiple family housing, including student housing and attached single-family housing. Other projects subject to ASA include construction of new parking lots or structures not associated with a building project subject to ASA (including, but not limited to, paving of existing unpaved parking areas) and construction, expansion, or modification of roadways on the campus. Small project exemptions from ASA may be granted by the County in accordance with Zoning Ordinance. Among the requirements for exemption from ASA are limits to building area increases for existing buildings of no more than 2,000 square feet and no new construction over 35 feet in height.

The ASA application includes submittal of various types of information that would assist the County in evaluating whether specific development projects would affect the visual character and quality of the site and its surroundings. Among these requirements are a project description, site plan, and exterior elevations. In addition, the application requires that an Environmental Information Form (EIF) be completed. As part of the EIF, photographs of the site must be provided that include the building site, unique features of the property, and views from the site to surrounding areas. The photo locations and direction of the views should also be shown on a location map. In the past, Stanford has submitted visual simulations of some proposed projects that could potentially be seen from public roads outside the 2018 General Use Permit boundary. This was most recently done for Stanford's EV Graduate Residences project currently under construction. Although it is not explicitly stated in the ASA Procedure Guide for Stanford University Projects in Santa Clara County, the County may require simulations for buildings constructed under the proposed Project through the ASA or other approval processes.

The EIF also requires responses regarding the identification of natural features of scenic value or rare or unique characteristics on the project site; whether the project would be constructed at or near a ridgeline or hilltop; and whether the project would include visual impact mitigation, such as landscaping.

Guidelines and policies published by the Stanford University Architect/Campus Planning and Design Office include a variety of documents for use by design consultants, contractors, and Stanford project managers in project planning and design. These documents describe standard elements, materials, colors, layouts and typical conditions that assist in integrating a specific development project into its campus context. The University Architect/Campus Planning and Design department is responsible for developing the campus master plan, along with final approval of exterior architecture, exterior lighting, building palette, and campus landscapes. Specific guidelines are available for certain areas of the campus to retain their aesthetic character, including the Arboretum, Campus Drive, Central Campus, and the Main Quad as well as Landscape Design Guidelines. Stanford also incorporates sustainable site planning principles to better integrate buildings into the surrounding landscape. Examples of sustainable site planning include a focus on development by district, pedestrian and bike connections, building siting to reduce energy use, and enhancement of the existing environment. Development proposals are also reviewed by the County through the ASA or other approval processes.

Finally, any proposed development along El Camino Real would be subject to the requirements of the County-approved *Plan for the El Camino Real Frontage*. This plan addresses building setbacks, building heights, land use, and vegetation/landscape character for Stanford property along El Camino Real from Quarry Road to Stanford Avenue.

Changes to the existing visual character or quality of Stanford lands subject to the 2018 General Use Permit would occur in specific locations as new buildings and other development projects are constructed during the lifetime of the Project. As indicated above, new development proposed under the 2018 General Use Permit would be constructed on vacant land, infill sites, and redevelopment sites within the Academic Growth Boundary. Visually, certain areas of the Project site would gradually become denser over the lifetime of the Project as new buildings are constructed in proximity to existing buildings. Other areas that are largely devoid of buildings, such as the Arboretum, the Oval and areas adjacent to Palm Drive, and Lagunita, would retain their existing visual character. The significance and potential for such development to degrade the visual character of the Project site is dependent on a number of factors, including the design, location, height, massing, and landscaping surrounding new buildings. Proposed development that would have the potential to affect visual character and quality under the 2018 General Use Permit would be subject to review by the County through the ASA process described above, including the County's ASA Guidelines. Prior to submittal of an ASA application, new projects would be designed in accordance with County and Stanford guidance and policy documents that would limit adverse aesthetic effects of such projects. Although changes in the appearance of the Stanford lands within the 2018 General Use Permit boundary would occur incrementally over the duration of the Project, compliance with internal Stanford policies and the County's ASA or other approval processes would not result in the degradation of the existing visual character or quality of the Project site. Thus, the impact would be less than significant.

Mitigation: None required.

Impact 5.1-4: The Project could create a new source of substantial light or glare that would adversely affect nighttime views in the area. (*Significant*)

Development proposed under the 2018 General Use Permit could increase ambient light levels due to light dispersion from the new buildings. Increases in night lighting could result in spillover lighting within the Project site or in adjacent neighborhoods that could adversely affect nighttime views in the vicinity of the Project site. Light sources could include additional street lights, illuminated signage, exterior safety lighting, light emitted from building windows, and headlights from vehicles. As noted above under Impact 5.1-3, guidelines and policies published by the Stanford University Architect/Campus Planning and Design Office include a variety of documents for use by design consultants, contractors, and Stanford project managers in project planning and design. These include exterior lighting guidelines that address lighting of paths and pedestrian areas, vehicular and roadway lighting, landscape and entryway lighting, accent lights, and building-mounted lights. The County also reviews development proposals through the ASA or other approval processes. In order to assure that new lighting constructed under the Project would not adversely affect nighttime view in the area, Mitigation Measure 5.1-4 would be implemented to reduce the impact to a less than significant level. By employing appropriate design standards, including those described in the ASA Guidelines, and minimizing the quantity of reflective material used in new construction, light and glare impacts related to lighting would be reduced to less-than-significant levels.

Mitigation Measure 5.1-4: Stanford shall submit a lighting plan for approval by the County Planning Office, as part of an ASA review, for each development project that would include exterior light sources. The plan shall show the extent of illumination that would be projected from proposed outdoor lighting. State-of-the-art luminaries shall be used where necessary, with high beam efficiency, sharp cut-off, and glare and spill control. Upward glow shall not be allowed in residential or academic uses.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 5.1-5: The Project, in combination with past, present, and future projects could potentially contribute to cumulative visual and scenic resource impacts. (*Significant*)

The geographic scope of potential cumulative impacts to visual and scenic resources encompasses the Stanford lands within the 2018 General Use Permit boundary and areas outside the boundary from which viewers could see the Project in conjunction with views of other projects in the cumulative scenario. This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resource, i.e., potential shared viewsheds, and not on jurisdictional boundaries.

Future development proposed under the 2018 General Use Permit would be constructed within the Academic Growth Boundary. As such, the Project would likely not be visible from Portola Valley, Los Alto Hills, Menlo Park, or unincorporated portions of San Mateo County. Therefore, no cumulative visual and scenic resource impacts would result from the Project combining with impacts of past, present, or reasonably foreseeable future projects within these jurisdictions.

Areas of Palo Alto with views of Stanford lands inside the Academic Growth Boundary include other Stanford-owned lands, such as the Research Park, Stanford Medical Center, and Stanford Shopping Center, as well as non-Stanford lands along El Camino Real and the College Terrace residential neighborhood. Any potential future Stanford projects on Stanford-owned lands with views of potential projects constructed under the 2018 General Use Permit would be similarly designed in accordance with Stanford guidance and policy documents that would limit potentially adverse visual characteristics of such projects.

Past, present, and reasonably foreseeable future projects within those areas of Palo Alto not owned by Stanford have the potential to create new visual impacts that could be affected by the Project. However, these areas are either built-out as residential neighborhoods (e.g., Southgate and College Terrace); institutional uses that are unlikely to be altered (i.e., Palo Alto High School); or border areas of Stanford along El Camino Drive that are designated as Campus Open Space (within the Arboretum and adjacent to Stanford Stadium), and thus would not be developed under the proposed Project.

Therefore, it is unlikely that the less than significant impacts of the Project regarding scenic vistas, scenic resources within a state scenic highway, or visual character would combine with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto with views of the Project and result in a cumulative impact for these environmental resources. Implementation of Mitigation Measure 5.1-4 would reduce the Project's contribution to potential cumulative light and glare effects. Projects constructed in Palo Alto would be subject to Section 18.23.030 of the City of Palo Alto Municipal Code, which includes measures to reduce off-site light spillage. The cumulative impact regarding light and glare would not be significant.

Mitigation: Implement Mitigation Measure 5.1-4.

Significance after Mitigation: Less than Significant.

5.1.6 References

California Department of Transportation (Caltrans); O*fficially Designated State Scenic Highways and Historic Parkways*, Santa Clara County, 2017.

City of Palo Alto; Municipal Code, Section 18.23.030, Performance Criteria for Multiple Family, Commercial, Manufacturing and Planned Community Districts, Lighting, as amended.

County of Santa Clara; *Guidelines for Architecture and Site Approval*, adopted March 19, 1981.

County of Santa Clara; *Stanford Community Plan*, adopted December 2000.

County of Santa Clara, Planning Office; *Stanford University General Use Permit*, adopted December 2000, revised November 26, 2013, and May 5, 2015.

County of Santa Clara; *Zoning Code,* as amended.

Stanford University; *2018 General Use Permit Application*, submitted to the County of Santa Clara November 21, 2016, as amended.

Stanford University; *Architectural Site Approval Procedure Guide for Stanford University Projects in Santa Clara Count*y, revised September 2014.

Stanford University; *Guidelines and Policies*, https://lbre.stanford.edu/architect/guides, 2017.

Stanford University; *Plan for the El Camino Real Frontage*, March 2008.

5.2 Air Quality

5.2.1 Introduction

This section addresses the potential for implementation of the proposed 2018 General Use Permit to result in significant air quality impacts. The section includes a description of the existing and 2018 environmental settings as it relates to air quality, and a discussion of applicable federal, State, and regional air quality regulations. The section addresses the potential for the proposed Project to result in significant impacts related to increases in criteria air pollutants and exposure to substantial pollutant concentrations. The analysis of emissions focuses on whether implementation of the Project would cause an exceedance of State ambient air quality standards. The section describes potential short-term construction related impacts, and direct and indirect operational emissions associated with development under the Project. The section also evaluates and analyzes the potential impacts of development that could occur under the proposed Project on regional and local air quality from both stationary and mobile sources of air emissions. Where significant impacts are identified, the section presents potentially feasible mitigation measures that could reduce the magnitude of potential impacts to less-than-significant levels. The analyses in this section are consistent with methodologies set forth in the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines (BAAQMD, 2017a). The section relies in part on an Air Quality Technical Report prepared by Stanford in support of its 2018 General Use Permit application (see Appendix AQT-REV), which was independently peer reviewed by ESA. This air quality analysis is closely coordinated with the analysis of potential impacts related to greenhouse gas emissions and global climate change, discussed in Section 5.7 of this EIR*,* Greenhouse Gas Emissions.

Geographical Scope

Air quality conditions and impacts have applicable context both regionally and locally. Some pollutant emissions, such as particulate matter, tend to predominately affect pollutant concentrations at a local scale, generally, within 1,000 feet of the source. Other pollutants, such as ozone, are regional pollutants formed in the atmosphere under certain meteorological conditions from precursor compounds that may originate some distance away. Consequently, the geographical scope for the air quality setting considers both the regional setting within the San Francisco Bay Area Air Basin as well as the local setting.

As explained in Chapter 3, Project Description, the proposed 2018 General Use Permit governs the entire Project site, however, it would not apply to development that is permitted by right under the County Zoning Ordinance. The single-family and two-family residences in the faculty/staff subdivision are permitted as matter of right, and therefore were not included in the study area within which Project air emissions are analyzed. In addition, under the 2018 General Use Permit Stanford does not propose development in areas zoned for medium-density faculty and staff housing (the Peter Coutts, Pearce Mitchell, and the Olmsted Terrace housing areas); or within any areas that are outside the Academic Growth Boundary. Therefore, these areas similarly are not included within the study area for analysis of Project air emissions.

The study area for Project air emissions includes all areas of the Project site that would be subject to the proposed 2018 General Use Permit and designated as Academic Campus and Campus Open Space in the Stanford Community Plan.

5.2.2 Existing Environmental Setting

Physical Setting

Climate and Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The Project site is located in northern Santa Clara County and is within the boundaries of the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB encompasses the nine-county region, including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties.

The climate of the SFBAAB is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the west coast of North America. During winter, the Pacific high-pressure system shifts southward, allowing more storms to pass through the region. During summer and early fall, when few storms pass through the region, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone, and secondary particulates, such as nitrates and sulfates.

Within the SFBAAB, the Project site is located within the San Francisco Peninsula (Peninsula) climatological subregion, which extends from northwest of San Jose to the Golden Gate and bounded on the southwest by the Santa Cruz mountains. The blocking effect of the Santa Cruz Mountains results in mean maximum summer temperatures in the low-80's. Mean minimum temperatures during the winter months are in the high-30's to low-40's on the eastern side of the Peninsula. Annual average wind speeds range from 5 to 10 mph throughout the Peninsula (BAAQMD, 2017a).

The prevailing winds along the Peninsula's coast are from the west. Pollutant transport from upwind sites is common. In the southeastern portion of the Peninsula, in the vicinity of San Jose, air pollutant emissions are relatively high due to motor vehicle traffic as well as stationary sources.

Air Pollutants of Concern (Criteria Air Pollutants)

The U.S. Environmental Protection Agency (USEPA) has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria. Below are descriptions of criteria pollutants that are a concern in the vicinity of the Project site.

Ozone (O_3)

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as volatile organic compounds or VOCs by some regulatory agencies) and oxides of nitrogen (NOx) in the presence of sunlight. The main sources of ROG and NOx, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process.

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide (CO)

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions,[1] CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

Over the past few decades, CO concentrations have declined dramatically in California due to regulatory controls and programs. Most areas of the State, including the region encompassing the Project site, are in full compliance with State and federal CO standards. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles, and improvements in fuels. The success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board's (CARB's)

[1] "Inversion conditions" refer to temperature inversion, whereby cold air lies below warmer air at higher altitudes (i.e., temperature increases with height).

2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas (CARB, 2004), shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the state designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels. Nitrogen dioxide is of concern for air quality because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is a major component of the group of gaseous nitrogen compounds commonly referred to as nitrogen oxides (NOx) which also includes nitric oxide (NO). Nitrogen oxides are produced by fuel combustion in motor vehicles, industrial stationary sources (such as refineries and cement kilns), ships, aircraft, and rail transit. Typically, NOx emitted from fuel combustion is in the form of NO and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NOx emitted from the source.

Sulfur Dioxide (SO_2)

SO_2 is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease.[2] Pollutant trends suggest that the SFBAAB currently meets and will continue to meet the state standard for SO_2 for the foreseeable future. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Particulate Matter (PM)

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns[3] or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and

[2] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx; p. C-16, accessed January 19, 2016.

[3] A micron is one-millionth of a meter.

construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect.

Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because these particles are so small and thus are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, and acute and chronic respiratory symptoms such as shortness of breath and painful breathing.

Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing. Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge, a comprehensive evaluation of research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope, 2006).

Lead

Ambient lead concentrations meet both the federal and State standards in the SFBAAB. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. Projects that would be developed under the Project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Toxic Air Contaminants (TACs)

TACs comprise a wide variety of compounds determined to pose an actual or potential risk to public health, either by increasing cancer risks or increasing other health risks such as respiratory diseases like asthma. The ambient background of TACs is the combined result of many diverse human activities, including gasoline stations, automobiles, dry cleaners, industrial operations, hospital sterilizers, and painting operations. In general, mobile sources contribute more significantly to health risks than do stationary sources. Both BAAQMD and CARB operate a network of monitoring stations that measure ambient concentrations of certain TACs that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area, as in all urban areas.

Growing evidence indicates that exposure to emissions from diesel-fueled engines, about 95 percent of which come from diesel-fueled mobile sources, may result in cancer risks that exceed those attributed to other measured TACs. In 1998, the Office of Environmental Health Hazard Assessment (OEHHA) issued a health risk assessment that included estimates of the cancer potency of diesel particulate matter (DPM) (OEHHA, 2009). Because DPM cannot be directly monitored in the ambient air, however, estimates of cancer risk resulting from DPM exposure must be based on concentration estimates made using indirect methods (e.g., derivation from ambient measurements of a surrogate compound).

Asbestos is also a TAC of concern, particularly in association with demolition of older buildings and structures. Asbestos is a fibrous mineral, which is both naturally occurring in ultramafic rock (a rock type commonly found in California) and used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, including asbestosis and lung cancer, it is strictly regulated based on its natural widespread occurrence and its former use as a building material. Geological mapping does not indicate the presence of naturally occurring asbestos at the Project site (CDMG, 2000).

Existing Air Quality

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of criteria air pollutants of concern within the Bay Area. Existing levels of air quality in and around the Project site can generally be inferred from ambient air quality measurements conducted by the BAAQMD at the nearest air quality monitoring station. The monitoring station with data closest to the Project site is located at 897 Barron Avenue in Redwood City, approximately 3.7 miles north of the Project site. This station monitors ozone (1-hour and 8-hour), fine particulate matter ($PM_{2.5}$), carbon monoxide, and nitrogen dioxide.

Table 5.2-1 shows a four-year summary of monitoring data (2013 through 2016) for these pollutants. The table also compares these measured concentrations with State and federal ambient air quality standards (shown in parenthesis). While attainment of State and Federal standards is based on regional air quality conditions, the values included in Table 5.2-1 include only a localized reference point, for purposes of context, as measured at the Redwood City station with values in excess of standards indicated in bold. The Redwood City Station only monitors $PM_{2.5}$. The nearest monitoring station that reports concentrations of PM_{10} is located at 158 Jackson Street in San José, approximately 15 miles southeast of the Project site. PM_{10} data from the San José station is also presented in Table 5.2-1.

Air quality measurements gathered through the network of regional air monitoring stations are considered representative of conditions within the Project site for ozone, which is a regional pollutant. Localized pollutants, such as PM, are likely similar at the Project site and at the Redwood City monitoring site because both locations have similar air pollutant sources in the area (motor vehicles) yet are generally distant (more than 1,000 feet) from major air pollutant sources such as U.S. Highway 101 (U.S. 101) and Interstate 280 (I-280), and the Caltrain rail line.

TABLE 5.2-1
AIR QUALITY MONITORING DATA SUMMARY (2013-2015)

Pollutant	Monitoring Data by Year			
	2013	2014	2015	2016
Ozone (Redwood City Station)				
Highest 1 Hour Average (ppm)[b]	0.083	0.086	0.086	0.075
Days over State Standard (0.09 ppm)[a]	0	0	0	0
Highest 8 Hour Average (ppm)[b]	0.075[d]	0.065	**0.071**	0.060
Days over National/State Standard (0.070 ppm)[a]	0	0	1	0
Carbon Monoxide (Redwood City Station)				
Highest 1 Hour Average (ppm)[b]	3.6	3.2	3.4	2.2
Days over State Standard (20 ppm)[a]	0	0	0	0
Highest 8 Hour Average (ppm)[b]	1.6	1.6	1.6	1.1
Days over National and State Standard (9 ppm)[a]	0	0	0	0
Fine Particulate Matter ($PM_{2.5}$) (Redwood City Station)				
Highest 24 Hour Average (μg/m3)[b] – National Measurement	**39.0**	35.0	34.6	19.5
Estimated Days over National Standard (35 $\mu g/m^3$)[a]	3	0	0	0
State Annual Average (12 μg/m3)[b]	10.7	7.1	5.7	8.3
Particulate Matter (PM_{10}) (San Jose Station)				
Highest 24 Hour Average (μg/m3)[b] – National Measurement	58	55	58	41
Estimated Days over National Standard (50 $\mu g/m^3$)[a,c]	5	1	1	0
State Annual Average (20 μg/m3)[b]	22.3	19.9	22.0	18.5
Nitrogen Dioxide (Redwood City Station)				
Highest 1 Hour Average (ppm)[b]	0.054	0.055	0.048	0.046
Days over State Standard (0.18 ppm)[a]	0	0	0	0
Days over National Standard (0.10 ppm)	0	0	0	0
State Annual Average (State Standard 0.03 ppm/National Standard 0.053 ppm)	0.013	0.011	0.011	0.009

NOTES:
[a] Generally, state standards and national standards are not to be exceeded more than once per year.
[b] ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
[c] PM_{10} is not measured every day of the year.
[d] In 2015, the EPA strengthened the 8-hour ozone standard from 0.075 ppm to 0.070 ppm, and the new standard became effective December 28, 2015. Consequently, the highest 8-hour average of 0.075 ppm did not exceed the standard applicable in 2013.

NDA = No Data Available.

Values in **Bold** exceed the respective air quality standard, while attainment designation of state and federal standards are determined regionally for each air basin.

SOURCE: BAAQMD, 2017b and CARB 2017.

Existing Sources of Air Pollution

Criteria Air Pollutants

Local sources of criteria air pollutants in the vicinity of the Project site include both stationary sources and transportation sources. Stationary sources consist of industrial activity, a waste water treatment plant and former landfill in Palo Alto. Transportation sources consist of vehicle emissions from nearby roadways, including U.S. 101 and I-280. **Table 5-2-2** below summarizes criteria air pollutant emissions from major emitting facilities in 2011 as reported by BAAQMD (BAAQMD, 2015). This year represents the most recent information that is readily available to the public (BAAQMD 2017e). None of these major emitting facilities are within 1,000 feet of the Project site and would not be appropriately included in a cumulative emissions assessment.

TABLE 5.2-2
MAJOR EMITTING FACILITIES IN THE PROJECT SITE VICINITY AND THEIR EMISSIONS

Facility	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO	SO_2
	Emissions in Tons per Year					
Gas Recovery Systems Inc., Marsh Road, Menlo Park	--	32.85	--	--	7.3	--
SRI Cogeneration Facility, Ravenswood Drive, Menlo Park	7.3	18.25	--	--	25.55	--
Former Shoreline Landfill, City of Mountain View	18.25	18.25	3.65	3.65	47.45	3.65
Google Inc., 1600 Amphitheater Parkway, Mountain View	3.65	7.3	--	--	25.55	--
City of Palo Alto Wastewater Control Plant, Embarcadero Road, Palo Alto	3.65	21.9	--	--	--	--

SOURCE: BAAQMD, Bay Area Emissions Inventory Summary Report: Criteria Air Pollutants, 2011

Toxic Air Contaminants

Ambient air monitoring data for TACs are measured at multiple locations throughout Northern California and the Bay Area. The closest monitoring stations are located at San Francisco-Arkansas Street station approximately 35 miles north of the Project site; and the San José-4th Street and San José-Jackson Street stations, approximately 20 miles southeast of the Project site.

Major local TAC sources include industrial activity in the vicinity of the Project site, as well as landfills, technology companies in Silicon Valley, and emissions from cars, trucks and trains using the area's highways and expressways, and rail transportation network. Similar to criteria air pollutant emissions, TAC emissions result from the operation of "stationary" facilities, as well as "mobile sources" such as passenger automobiles and light-duty trucks; other mobile equipment such as portable diesel generators; ships and harbor craft such as tugboats; cargo handling equipment, heavy duty trucks, and other construction equipment; and rail locomotives.

Facilities in and around the Project site emit TACs. Typical emitters of TACs in the region include large office buildings with emergency generators, data farms with emergency generators, research companies and institutions, water quality plants, and manufacturing operations.

Sensitive Land Uses

Certain groups of people are considered more sensitive than others to air pollutants. The reasons for heightened sensitivity may include age or health conditions. The CARB defines sensitive individuals as segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality) (CARB, 2005). Land uses where sensitive receptors are found generally include schools, day care centers, libraries, hospitals, residential care centers, parks, churches, and residences.

The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and residential care centers are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residences are considered sensitive to poor air quality because people usually are present in their home for many hours per day over extended periods of time, resulting in longer exposure to ambient air. Recreational uses are considered sensitive due to the greater exposure to ambient air because vigorous exercise places a high demand on the human respiratory system.

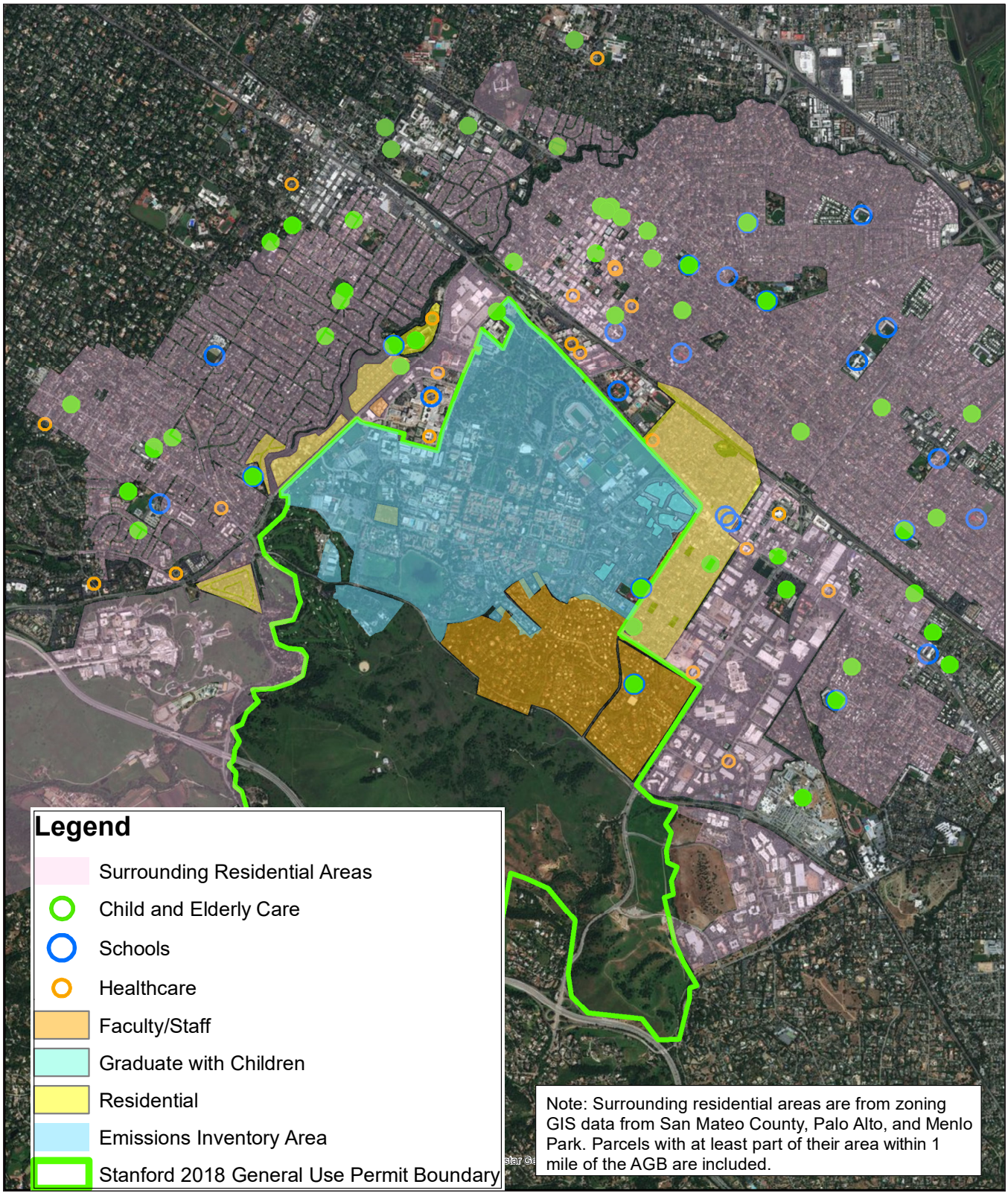
As shown in **Figure 5.2-1**, sensitive receptors located within one mile of Project site include healthcare, schools, and child and elderly care centers. Residential areas in the vicinity of the Project site are also considered to be sensitive receptors.

5.2.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Approach to Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020. Since the EV Graduate Residences will not be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline.

The Air Quality Technical Report (see Appendix AQT-REV) estimated the criteria air pollutant and TAC emissions inventories in the study area for the 2018 environmental baseline condition, including from both building operations and mobile sources, and construction emissions. The annualized criteria air pollutant emissions in the study area for the 2018 environmental baseline are presented in **Table 5.2-3** below, while emissions of TACs in the emissions inventory area for the 2018 environmental baseline are presented in **Table 5.2-4**.



SOURCE: Ramboll Environ, 2018

Stanford 2018 General Use Permit . 160531

Figure 5.2-1
Sensitive Receptor Locations

TABLE 5.2-3
CRITERIA AIR POLLUTANT EMISSIONS—2018 BASELINE

Source	ROG	NOx	PM_{10}	$PM_{2.5}$
Maximum Annual Emissions (Tons Per Year)				
Mobile Sources	29	54	31	7.7
Hot Water Generators	0.33	0.61	0.38	0.38
Steam Plant	0.24	0.82	0.33	0.33
Natural Gas Boilers	1.0	19	1.4	1.4
Emergency Generators	0.38	7.3	0.21	0.21
Laboratories	15	--	--	--
Fuel Stations	0.07	--	--	--
Total[b]	47	82	33	10

NOTES:
[a] $PM_{2.5}$ from non-mobile sources conservatively assumed to be equivalent to PM_{10}.
[b] Emission totals may not appear to total due to rounding.

SOURCE: Ramboll Environ, 2018

TABLE 5.2-4
TAC EMISSIONS — 2018 BASELINE

	Benzene	Formaldehyde	Toluene	1,3-Butadiene	Diesel Particulate Matter (DPM)
TAC Emissions in Tons per Year					
Year 2018	0.60	0.022	0.20	0.16	2.7

SOURCE: Ramboll Environ, 2017

It should be noted that, in addition to the criteria air pollutant and TAC emissions inventories completed for the 2018 environmental baseline, the Air Quality Technical Report also provided emissions inventories for past years 2014 and 2015. A comparison of the emissions inventories for these past years to that of the 2018 environmental baseline shows a general trend in decreased air emissions between 2014 and 2018. This is due to several factors. Mobile sources are reasonably expected to generate lower emissions in 2018 based on existing regulatory standards. In addition, notable changes to Stanford's energy systems have occurred since 2014 that have resulted in substantially decreased air emissions.[4] Also, the 2018 environmental baseline does not include air emissions from the Valero service station, previously located at 715 Serra Street, which was closed in 2016.

[4] In 2015, Stanford completed an overhaul of its campus heating and cooling system, known as Stanford Energy System Innovations (SESI), which replaced Stanford's steam-based heating system with a hot-water based heating system, and replaced its cogeneration plant with a more efficient Central Energy Facility (CEF). In addition, Stanford procures electricity via a Direct Access program from the grid through Electricity Service Providers that includes renewable resources within their portfolios.

5.2.4 Regulatory Setting

Criteria Pollutants

The federal Clean Air Act (FCAA) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The USEPA is responsible for implementing the programs established under the FCAA, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of SIPs. However, the USEPA has authorized states with air programs that meet or exceed federal standards to implement many of the federal programs while retaining an oversight role to ensure that the programs continue to be implemented.

In California, CARB is responsible for establishing and reviewing the State ambient air quality standards, developing and managing the California SIP, securing approval of this plan from USEPA, identifying TACs, regulating mobile emissions sources in California, and overseeing the activities of air quality management districts, which are organized at the county or regional level. Air quality management districts, such as the BAAQMD, are primarily responsible for regulating stationary emissions sources at facilities within their geographic areas and for preparing the air quality plans that are required under the federal and State Clean Air Acts.

Federal

National Ambient Air Quality Standards

The FCAA requires the USEPA to identify National Ambient Air Quality Standards (NAAQS or "national standards") to protect public health and welfare. National standards have been established for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. **Table 5.2-5** shows current national and State ambient air quality standards, as well as the Bay Area attainment status and common sources for each pollutant.

Pursuant to the 1990 FCAA Amendments, the USEPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. Table 5.2-5 shows the current attainment status for the State and the SFBAAB.

The FCAA Amendments added requirements for states containing areas that violate the national standards to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has responsibility to review all SIPs to determine if they conform to the mandates of the FCAA Amendments and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the SFBAAB.

TABLE 5.2-5
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Non-Attainment	0.070 ppm	Marginal Non-Attainment	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.090 ppm	Non-Attainment	---	---	
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9.0 ppm	Attainment (maintenance area)	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.180 ppm	Attainment	0.100 ppm	Unclassified	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment	
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 μg/m3	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 μg/m3	Non-Attainment	150 μg/m3	Unclassified	
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m3	Non-Attainment	12 μg/m3	Unclassified	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	24 hour	---	---	35 μg/m3	Non-Attainment	
Lead	Calendar Quarter	---	---	1.5 μg/m3	Attainment	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 μg/m3	Attainment	---	---	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	No Federal Standard	---	Geothermal Power Plants, Petroleum Production and refining

SOURCE: BAAQMD, 2017d.

Title V Operating Permit (40 CFR Part 70)/Synthetic Minor Operating Permit

Title V of the 1990 FCAA Amendments requires an operating permit for all major sources and some minor sources of air pollution. A Title V permit grants a source permission to operate, and includes all air pollution requirements that apply to the source, including emissions limits and monitoring, record keeping, and reporting requirements. It also requires that the source report its compliance status with respect to permit conditions to the permitting authority. The applicability threshold for a major source is dependent on whether the area is in attainment or nonattainment, and is based on the potential to emit criteria pollutants. Title V permits are typically issued by state or local agencies, although a small number of permits are issued by the USEPA (EPA, 2013).

Title V permits in the Bay Area are issued by the BAAQMD. In the Bay Area, Title V requirements are implemented by Regulation 2 Rule 6 of the BAAQMD Rules and Regulations. In the BAAQMD, any source that emits or has the potential to emit 100 tons per year (tons/yr) or more of any criteria air pollutant, 100,000 tons/yr of greenhouse gas emissions, 10 tons/yr of a single hazardous air pollutant (HAP), or 25 tons/yr of all HAPs combined is a major source and must obtain a Title V operating permit.

A facility that has a potential to emit that exceeds the above applicability thresholds may apply to accept federally enforceable limitations to keep emissions below such levels. Such facilities are called synthetic minor sources. Synthetic minor operating permits (SMOP) are issued by the BAAQMD and are implemented by Regulation 2 Rule 6 of the BAAQMD Rules and Regulations. Stanford applied for a SMOP in 2014 and it expects the permit to be issued in the near future.

New Source Performance Standards (40 CFR Part 60)

The USEPA promulgated New Source Performance Standards (NSPS) for major and minor sources on a category-by-category basis. NSPS are national emission standards that are progressively tightened over time to achieve a steady rate of air quality improvement without unreasonable economic disruption. The NSPS imposes uniform requirements on new and modified sources based on the best demonstrated technology (BDT). BDT refers to the best system of continuous emissions reduction that has been demonstrated to work in a given industry, considering economic costs and other factors, such as energy use. In other words, any new source of air pollution must install the best control system currently in use within that industry. In the Bay Area, the NSPS program is implemented by the BAAQMD.

State

CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county Air Pollution Control Districts and regional Air Quality Management Districts. CARB establishes State ambient air quality standards and vehicle emissions standards. California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. California has air quality standards for some pollutants for which there is no corresponding national standard. Under the California Clean Air Act (which is patterned after the FCAA), areas have been designated as attainment or nonattainment with respect to the State standards. Table 5.2-5 summarizes the Bay Area's attainment status with regard to California standards.

Control of Particulate Matter – Senate Bill 656

CARB and regional air districts are responsible for implementing the provisions of Senate Bill (SB) 656 of 2003, which sought to reduce PM_{10} and $PM_{2.5}$ air pollution by establishing California Health and Safety Code 40724.[5] As a first step, CARB developed and approved a list of readily available, feasible, and cost-effective control measures based on existing California rules, regulations, and programs for stationary, area-wide, and mobile sources. The regional air districts then identified schedules for implementation of selected measures, prioritizing measures based on the extent of the PM problem in their jurisdiction, as well as based on the cost-effectiveness of the selected measures. Currently, air districts are working on evaluating and adopting rules in their specific implementation schedules. These schedules, along with CARB's other programs, are designed to continue progressing towards reducing the public's exposure to PM and towards attaining the state and federal ambient air quality standards.

Statewide Truck and Bus Regulation

CARB adopted the Statewide Truck and Bus Regulation in December 2008 and amended it in December 2011 and December 2014. The regulation requires heavy-duty vehicles to be retrofitted with PM filters beginning January 1, 2012, and requires older vehicles to be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses must have 2010 model year engines or equivalent. The 2014 amendment extended concessions for the timeline of retrofitting PM filters to small fleets, owners that were financially unable to comply with PM filter requirements in 2014, and other groups with special circumstances, in addition to making other minor changes to the regulation.

Off-Road Emissions Regulation for Compression-Ignition Engines and Equipment

Engines designated as nonroad engines by USEPA are known as off-road engines in California state regulations implemented by CARB. Similar to the USEPA Nonroad Diesel Rule, the Off-Road Emissions Regulation for New Compression-Ignition Engines and Equipment applies to diesel engines such as those found in construction, general industrial, and terminal equipment. Initially adopted in 2000 and amended in 2004, the regulation establishes Tier emission standards, test procedures, and warranty and certification requirements. For some model years and engine size, the CARB Tier emission standards are more stringent than the USEPA standards.

CARB In-Use Off-Road Diesel Vehicle Regulation

In July 2007 CARB adopted the In-Use Off-Road Diesel Vehicle Regulation and amended it in December 2011. The regulation requires owners of off-road mobile equipment powered by diesel engines 25 HP or larger to meet the fleet average or best available control technology (BACT) requirements for NO_X and PM emissions by January 1 of each year. The regulation also establishes idling restrictions, limitations on buying and selling older off-road diesel vehicles (Tier 0), reporting requirements, and retrofit and replacement requirements. The requirements and compliance dates vary by fleet size, with performance requirements for large fleets beginning in 2014, medium fleets in 2017, and small fleets in 2019. Requirements regarding idling, disclosure,

[5] State of California. Senate Bill No. 656. 2003, Ch. 738.

reporting, and labeling took effect in 2008 and 2009. The Diesel Off-road On-line Reporting System is an online tool designed to help fleet owners report their off-road diesel vehicle inventories and actions taken to reduce vehicle emissions to CARB, as required by the In-Use Off-Road Diesel Vehicle Regulation.

Diesel Fuel Regulations

Similar to the USEPA, California has adopted an array of regulations aimed to reduce emissions from mobile fuel combustion sources, including both fuel and source-specific emissions standards such as emissions control technologies. The current standards for diesel fuel in California include:

- **Sulfur Content of Diesel Fuel** – This standard prohibited the sale of vehicular diesel fuel with a sulfur content exceeding 500 ppm by weight after 1993. Starting in 2006, the sulfur limit was reduced to 15 ppm to be phased in over June through September 2006.
- **Aromatic Hydrocarbon Content of Diesel Fuel** – This standard prohibited the sale or supply of any diesel fuel after 1993 if the aromatic hydrocarbon content exceeds 10% by volume. Starting in December 2004, section 93114 of the CCR required that air quality management districts apply the same standards to encompass non-vehicular diesel fuel.
- **Lubricity of Diesel Fuel** – This standard prohibits the sale or supply of any diesel fuel after January 1, 2005 unless the fuel meets minimum lubricity level.

These California regulations establish the same fuel sulfur content limits as the federal diesel fuel regulations described in Section 2.2.1.1 above [15 ppm (0.0015%) for all non-ocean going vessel diesel-fueled engines]; however, the California fuel regulations accelerate the effective dates of the requirements for non-highway applications within California by 3 to 5 years.

Land Use Planning

In April 2005, CARB published *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). This handbook is intended to give guidance to local governments in the siting of sensitive land uses near sources of air pollution.

Regional and Local

Air Quality Plans

The 1977 FCAA amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 California Clean Air Act also requires development of air quality plans and strategies to meet State air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as SIPs, discussed above.

Bay Area plans are prepared with the cooperation of the BAAQMD, Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). In April 2017, the BAAQMD adopted the *2017 Clean Air Plan*.[6] The plan's primary goals are to protect public health and protect the climate. The plan includes a wide range of proposed control measures, which consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. The *2017 Clean Air Plan* updates the *Bay Area 2010 Clean Air Plan* and complies with state air quality planning requirements as codified in the California Health and Safety Code. The Air Basin is designated non-attainment for both the 1- and 8-hour state ozone standards. In addition, emissions of ozone precursors in the SFBAAB contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins.

The 2017 Clean Air Plan contains 85 measures to address reduction of several pollutants: ozone precursors, particulate matter, air toxics, and/or GHGs. Other measures focus on a single type of pollutant, potent GHGs such as methane and black carbon, or harmful fine particles that affect public health. These control strategies that can be grouped into the following categories:

- Stationary source measures;
- Transportation control measures;
- Energy Control Measures;
- Building Control Measures;
- Agricultural Control Measures;
- Natural and Working Lands Control Measures;
- Waste Management Control Measures;
- Water Control Measures; and
- Super GHG Control Measures.

BAAQMD Rules and Regulations

The BAAQMD is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting stationary sources in the Bay Area. BAAQMD does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various stationary sources, and identify specific pollution reduction measures that must be implemented in association with various activities.

These rules regulate not only emissions of the six criteria air pollutants; TACs emissions sources subject to these rules are also regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of projects developed within the

[6] BAAQMD, *Draft 2017 Clean Air Plan, Spare the Air, Cool the Climate,* 2017. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/baaqmd_2017_cap_draft_122816-pdf.pdf?utm_campaign=CAP+2017+Draft&utm_medium=email&utm_content=article3_link1. Accessed on January 13, 2017.

Project Area would be subject to the BAAQMD Rules and Regulations. Both federal and State ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's Rules and Regulations.

With respect to construction activities associated with implementation of the proposed Project, applicable BAAQMD regulations would relate to the following:

Regulation 9-7 (Boilers). Regulation 9-7 provides standards for the control of NOx and CO from industrial, institutional, and commercial boilers, steam generators, and process heaters greater than 2 million British thermal unit [MMBTU]/hr. It has standards for NO_X and CO concentrations, depending on the rate heat limit. The regulation also has requirements for insulation, stack gas temperature, testing, monitoring, and recordkeeping. Stanford's hot water generators of the new CEF and the boilers of the Replacement Process Steam Plant are subject to Regulation 9-7.

Regulation 9-8 (Internal Combustion Engines). Regulation 9-8 provides standards for the control of NO_X and CO from internal combustion engines. Emissions standards of the regulation do not apply to emergency generators. However, emergency generators are limited to up to 50 hours of reliability-related activities within a calendar year. The regulation also requires recordkeeping.

BAAQMD CEQA Air Quality Guidelines

The BAAQMD *CEQA Air Quality Guidelines* (Guidelines) advise lead agencies on how to evaluate potential air quality impacts, including establishing quantitative and qualitative thresholds of significance. In June 2010, the BAAQMD adopted updated Guidelines, including new thresholds of significance, and revised them in May 2011 (BAAQMD, 2011). The thresholds BAAQMD adopted were called into question by a minute order issued January 9, 2012 in *California Building Industry Association v. BAAQMD,* Alameda Superior Court Case No. RGI0548693. The minute order stated that "The Court finds [the BAAQMD's adoption of thresholds] is a CEQA Project, the court makes no further findings or rulings."

The claims made in the case concerned the CEQA impacts of adopting the thresholds, and in particular, how the thresholds would affect land use development patterns. Petitioners argued that the thresholds for Health Risk Assessments encompassed issues not addressed by CEQA. As a result, the BAAQMD resolutions adopting and revising the significance thresholds in 2011 were set aside by a judicial writ of mandate on March 5, 2012. In May 2012, the BAAQMD updated its Guidelines to continue to provide direction on recommended analysis methodologies, but without recommended quantitative significance thresholds. On August 13, 2013, the First District Court of Appeal ordered the trial court to reverse the judgment and upheld the BAAQMD's CEQA thresholds (*California Building Industry Association v. Bay Area Air Quality Management District,* Case No. A135335 & A136212 [Court of Appeal, First District, August 13, 2013]).

The California Supreme Court granted review of the appeal, but only to address whether or not CEQA requires an analysis of how existing environmental conditions will impact future residents or users of a proposed project and did not review or address the adequacy of specific thresholds adopted by the BAAQMD in 2011. On December 17, 2015, the Supreme Court concluded that agencies subject to CEQA generally are not required to analyze the impact of existing

environmental conditions on a project's future users or residents, reversing the Court of Appeal's judgment on that issue. However, the court did acknowledge that when a proposed project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users.

The case was the remanded back to the Court of Appeal on August 12, 2016 which concluded that "the challenged thresholds are not invalid on their face, but may not be used for the primary purpose envisioned by District, namely, to routinely assess the effect of existing environmental conditions on future users or occupants of a project" (CBIA v. BAAQMD [2016] 1 Cal.App.5th 715).

In May of 2017 the BAAQMD released its 2017 update to the Guidelines which once again contain the thresholds of significance formally presented in the 2011 Guidelines for the consideration of lead agencies in assessing air quality impacts. The 2017 Guidelines specify that, under CEQA, the receptor thresholds (the analysis of exposing new receptors to existing sources of toxic air pollution and odors) should not be applied to "routinely assess the effect of existing environmental conditions on future users or occupants of a project."

Toxic Air Contaminants

Air quality regulations also focus on TACs (or in federal terminology, HAPs). In California, TACs are defined by CARB as those air pollutants that "may cause or contribute to an increase in deaths or in serious illness, or which may pose a present or potential hazard to human health". There are currently over 200 substances that have been identified by CARB as TACs. While most TACs originate from human sources such as fossil fuel combustion or dry cleaning facilities, natural sources such as forest fires and volcanic eruptions also contribute TACs to ambient air.

The nature and magnitude of the potential health effects of TACs depends on the substance, concentration, and period of exposure. Some TACs cause effects in response to short-term (acute) exposure; others cause effects only after sustained exposures over weeks, months, or years. The effects of acute exposure may be minor, such as watery eyes or respiratory irritation, or they may be extensive, such as damage to the reproductive system or nervous system. If exposure to a sufficient concentration occurs for a sufficient period, individuals may have an increased risk of developing cancer, or a greater likelihood of experiencing non-carcinogenic chronic adverse effects. These chronic non-carcinogenic health effects may be minor, such as nasal rhinitis or respiratory irritation; or they may involve long-term damage to the immune, neurological, reproductive, respiratory, or other systems.

While some natural sources, such as forest fires, contribute TACs to ambient air, most TACs originate from anthropogenic (human-made) sources. Industrial facilities and mobile sources are significant sources of TACs. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene. Most recently, DPM was identified as a TAC by CARB. DPM is a complex mixture of hydrocarbons, particulates, gases, and other compounds. DPM is emitted by diesel-fueled internal combustion engines, and the composition of the emissions varies depending on engine type, operating conditions, fuel

composition, lubricating oil, and whether an emission control system is present. Both California's OEHHA and the USEPA consider DPM to be a carcinogen. Both agencies also recognize that exposure to DPM may cause non-cancer effects such as change(s) in lung function and airway inflammation. DPM is a component of PM, and recent scientific data have linked prolonged exposure to PM to premature mortality, respiratory effects, and cardiovascular disease.

For TACs that do not cause cancer, threshold levels of chemicals are established by OEHHA, which are thought to be safe. However, in general, for those TACs that may cause cancer, even the smallest concentrations of chemicals may present some risk of cancer. In other words, from a regulatory point of view, there is no threshold level below which adverse health risks, although potentially small, may not be estimated to occur for carcinogenic chemicals. This is in contrast with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which ambient standards have been established. The USEPA and CARB regulate TACs through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (Maximum Achievable Control Technology [MACT] and Best Available Control Technology for Toxics [TBACT], respectively) to limit emissions. These, in conjunction with additional rules set forth by BAAQMD, establish the regulatory framework for TACs.

Unlike criteria air pollutants, TACs do not have region-wide ambient concentration limits such as NAAQS or CAAQS; there is no equivalent to "attainment status" for TACs. Concentrations of TACs may be regulated indirectly based on results from a health risk assessment (HRA). An HRA is a scientifically based tool used to determine if exposure to chemicals(s) pose a significant risk (cancer risk or non-cancer hazards) to human health. The effects of air toxic emissions are relatively localized, with concentrations tending to decrease markedly with distance from the source due to dilution and/or degradation. Due to this localized nature, HRAs tend to focus on receptors in the immediate vicinity of the point of release.

Federal Hazardous Air Pollutant Regulations

Hazardous Air Pollutants (HAPs)

Regulation of TACs, termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal, state and local controls on individual sources. The 1977 FCAA Amendments required the USEPA to identify National Emission Standards for HAPs to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals.

The FCAA of 1970 required the USEPA to identify and list all air pollutants (not already identified as criteria pollutants) that "may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible or incapacitating reversible illness." The standards for TACs were considerably strengthened under the 1990 FCAA Amendments with the listing of 189 HAPs. For each HAP identified, the USEPA was required to promulgate National Emissions Standards for Hazardous Air Pollutants (NESHAPs) at levels that would ensure the protection of the public health with an ample margin of safety and to prevent any significant and adverse environmental effects, which may reasonably be anticipated, on wildlife, aquatic life, or other

natural resources. The NESHAPs can set different requirements for major and area sources. Major sources are defined as stationary sources with potential to emit more than 10 tons/yr of any HAP or more than 25 tons/yr of any combination of HAPs; all other sources regulated under Title III of the FCAA Amendments are considered area sources. Issuance of the emission standards occurs in two phases. The first phase consists of technology-based emission standards designed to produce a high level of emission reductions for major sources of HAPs, which are referred to as MACT standards. For area sources, the standards may be different, based on generally available control technology. In the second phase, the USEPA must issue health risk-based emissions standards where such standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAPs. These second-phase standards are generally referred to as "residual MACT" standards.

The FCAA Amendments also required the USEPA to issue vehicle or fuel standards containing reasonable requirements to control HAP emissions, applying at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the FCAA Amendments also required the use of reformulated gasoline in selected U.S. cities (those with the most severe O_3 nonattainment conditions) to further reduce mobile-source emissions, including air toxics.

The federal hazardous air pollutant regulations that are applicable to Stanford include:

- 40 CFR Part 63, Subpart A, which Establishes applicability determination for stationary sources; prohibits circumvention and fragmentation of sources; includes definitions and requirements for preconstruction review and notification, performance testing, monitoring, recordkeeping and reporting, to which subparts can incorporate by reference or override; and
- 40 CFR Part 63, Subpart ZZZZ which establishes start-up requirements for Reciprocating Internal Combustion Engines (RICE) at area sources; management practices (air/filter replacement schedule, inspection schedule) listed in this regulation (or in conjunction with an alternative management program administered by State permitting authorities), for stationary emergency RICE; and recordkeeping requirements.

State TAC Regulations

Tanner Air Toxics Act

TACs in California are primarily regulated through California Health and Safety Code Chapter 3.5 (sections 39650 to 39674) and California Food and Agriculture Code Chapter 3, Article 1.5 (sections 14021 to 14026), established by the Tanner Air Toxics Act (Assembly Bill [AB] 1807). The above referenced sections of the Health and Safety Code and Food and Agriculture Code set forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before ARB can designate a substance as a TAC. To date, CARB has adopted the USEPA's list of HAPs as TACs and has identified more than 20 additional TACs.

Once a TAC is identified, CARB then adopts an ATCM for sources that emit that particular TAC. If there is a safe threshold at which there is no toxic effect from a substance, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

Proposition 65

The Safe Drinking Water and Toxic Enforcement Act of 1986, California Health and Safety Code 25249.6, was passed as a ballot initiative in 1986 and is intended to protect citizens and the State's drinking water from chemicals known to cause cancer or reproductive toxicity (including birth defects), as well as to notify citizens about their exposure to such chemicals.

AB 2588

The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588; California Health and Safety Code Section 44300 et seq.) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate toxic air emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

Control of Diesel Particulate Matter

In August of 1998, CARB identified DPM as a TAC. CARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000). The document contains proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent by 2010, and by 85 percent by 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines.

The CARB Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines was adopted in 2004 and amended in May 2011, with the goal of reducing criteria pollutant and DPM emissions from diesel-fueled stationary compression ignition engines. The ATCM outlines emission standards, fuel use requirements, and operational hour limitations for prime and emergency back-up engines. The 2011 amendments harmonized many of the ATCM requirements with the 2006 USEPA Standards of Performance for Stationary Compression-Ignition Internal Combustion Engines (NSPS Subpart IIII); however, some ATCM emission standards and other requirements are more stringent than the NSPS.

Regional TAC Regulations

BAAQMD CARE Program

Under the Community Air Risk Evaluation (CARE) program, BAAQMD has identified areas with high TAC emissions (referred to in this context as "priority" or "impacted" communities) and sensitive populations that could be affected by them, and to uses this information to establish

policies and programs to reduce TAC emissions and exposures.[7] The impacted communities identified to date are located in Concord, Richmond/San Pablo, San Jose, eastern San Francisco, western Alameda County, Vallejo, San Rafael, and Pittsburg/Antioch. The main objectives of the program are to:

- Evaluate potential health risks associated with exposure to TACs from both stationary and mobile sources;
- Assess potential exposures to sensitive receptors and identify impacted communities;
- Prioritize TAC reduction measures for significant TAC sources in impacted communities; and
- Develop and implement mitigation measures - such as grants, guidelines, or regulations - to improve air quality, focusing initially on priority communities.

BAAQMD Planning Healthy Places

The purpose of the Planning Healthy Places guidelines is to promote efficient and sustainable land use development while ensuring clean and healthy air for residents. Planning Healthy Places was developed on the premise that regional ambient air emissions and health risk control programs do not account for localized impacts to communities located in close proximity to busy roadways, factories, airports, and other sources of air pollution.

BAAQMD prepared these guidelines outside the CEQA context to assist developers and land use planners with addressing potential land use compatibility issues associated with locating people close to localized sources of air pollution, specifically PM and TACs. The BAAQMD identifies a list of "best practices" to reduce emissions or exposure to sensitive receptors who are in close proximity to development projects. Through Planning Healthy Places, the BAAQMD denotes subregions in the Bay Area located close to highways and busy roadways where "best practices" are recommended to reduce exposure and emissions, as well as regions situated close to large and complex emissions sources (such as ports, refineries, and gas stations) where further study is required to assess air pollution levels. There are a number of further study areas located in the vicinity of Stanford, which correspond to gas stations, dry cleaners, and back-up generators.

BAAQMD Rules and Regulations

BAAQMD has implemented specific rules and regulations that limit emissions from various sources, and that identify specific pollution reduction measures. Some emissions sources are further subject to legal requirements imposed through BAAQMD's permitting process.

[7] Bay Area Air Quality Management District (BAAQMD). 2016. CARE Program. Accessed July 1, 2016. http://www.baaqmd.gov/plans-and-climate/community-air-risk-evaluation-care-program.; and BAAQMD. 2014. Identifying Areas with Cumulative Impacts from Air Pollution in the San Francisco Bay Area. Accessed July 1, 2016. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/ImpactCommunities_2_Methodology.ashx?la=en

Under BAAQMD Rule 2-1 (General Permit Requirements), Rule 2-2 (New Source Review [NSR]), and Rule 2-5 (NSR of TACs), all sources that have the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted if the sources are constructed and operated in accordance with applicable regulations, including NSR standards and ATCMs. BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions, and on the proximity of the facilities to sensitive receptors. BAAQMD analyzes sources that require a permit (e.g., performs health risk assessments) based on their potential to emit TACs. If it is determined that a project's emissions would exceed BAAQMD's threshold of significance for TACs, as identified below, the source has to implement BACT for TACs (TBACT) to reduce emissions. BAAQMD's TBACT measures apply to individual facility sources, such as storage tanks, boilers, and emergency generators. If a source cannot reduce the risk below the threshold of significance even after implementing TBACT, then BAAQMD will deny the permit. BAAQMD permit requirements help to reduce emissions and related health impacts from new emissions sources, as well as from existing emissions sources by requiring them to apply new technology when retrofitting.

A number of laboratory sources and operations are exempt from the "authority to construct" and "permit to operate" authorizations detailed in BAAQMD Rule 2-1, provided that Responsible Laboratory Management Practices (RLMP) are followed. RLMP include the incorporation of information about the emissions of volatile TACs into training for laboratory personnel, avoidance of open container storage of volatile TACs and hazardous chemical waste, the periodic monitoring of fume hoods, and proper disposal of hazardous chemical waste containing TACs. If Responsible Laboratory Management Practices are followed, then the following laboratory sources are exempt from permitting requirements:

- Teaching laboratories used exclusively for classroom experimentation and/or demonstration;
- Laboratories located in a building where the total laboratory floor space is less than 25,000 square feet or the total number of fume hoods is less than 50. In addition, laboratory units for which the owner or operator can demonstrate that there will not be any TAC emissions (except under accidental conditions) are not included in the floor space or fume hood calculations;
- Bench scale laboratory equipment or processes (excluding pilot plants) used exclusively for experimentation, quality control testing, or research and development; and
- Vacuum producing devices in laboratory operations which are used exclusively with other equipment that are also exempt from permitting, and which do not remove or transfer air contaminants from another source.

BAAQMD's permitting process applies to stationary sources. Nonstationary sources (e.g., on-road vehicles), are not subject to air quality permits. Emissions controls on mobile sources are subject to regulations implemented at the federal and State levels by USEPA and ARB, respectively.

County of Santa Clara

Santa Clara County General Plan

On August 25, 2015, the County adopted a new Health Element of the Santa Clara County General Plan. The Health Element incorporates and updates certain subject matter and policies from the previous health and safety chapters of the Santa Clara County General Plan and provides a renewed emphasis on collaborative, comprehensive approaches to planning for community health. The Health Element Section G, Air Quality and Climate Change, contains the following strategy and policies with regard to air quality:

Strategy #1: Strive for air quality improvement through regional and local land use, transportation, and air quality planning.

Policy HE-G.1 - *Air quality environmental review.* Continue to utilize and comply with the Air District's project- and plan-level thresholds of significance for air pollutants and greenhouse gas emissions.

Policy HE-G.2 - *Coordination with regional agencies.* Coordinate with the Air District to promote and implement stationary and area source emission measures.

Policy HE-G.3 - *Fleet upgrades.* Promote Air District mobile source measures to reduce emissions by accelerating the replacement of older, dirtier vehicles and equipment, and by expanding the use of zero emission and plug-in vehicles.

Policy HE-G.4 - *Off-road sources.* Encourage mobile source emission reduction from off-road equipment such as construction, farming, lawn and garden, and recreational vehicles by retrofitting, retiring and replacing equipment and by using alternate fuel vehicles.

Policy HE-G.5 - *GHG reduction.* Support efforts to reduce GHG emissions from mobile sources, such as reducing vehicle trips, vehicle use, vehicle miles traveled (VMT), vehicle idling, and traffic congestion. These efforts may include improved transit service, better roadway system efficiency, state-of-the-art signal timing and Intelligent Transportation Systems (ITS), transportation demand management, parking and roadway pricing strategies, and growth management measures.

Policy HE-G.6 - *Regional/local plans*. Encourage and support regional and local land use planning that reduces automobile use and promotes active transportation.

Policy HE-G.7 - *Sensitive receptor uses.* Promote measures to protect sensitive receptor uses, such as residential areas, schools, day care centers, recreational playfields and trails, and medical facilities by locating uses away from major roadways and stationary area sources of pollution, where possible, or incorporating feasible, effective mitigation measures.

Policy HE-G.8 - *CARE Communities focus.* Promote awareness of geographic areas subject to persistently poorer air quality and assist the Air District in monitoring and reducing emissions from all sources in CARE communities.

Policy HE-G.9 - *Healthy infill development.* Promote measures and mitigations for infill development to protect residents from air and noise pollution, such as more stringent

building performance standards, proper siting criteria, development and environmental review processes, and enhanced air filtration.

Policy HE-G.10 - *Conservation*. Promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The Stanford Community Plan Chapter 7, Health and Safety, contains the following strategies and policies with regard to air quality:

Strategy #1: Manage Campus Growth and Land Use for Cleaner Air.

Policy SCP-HS 1 **-** Limit campus growth and development to lands within the Academic Growth Boundary in order to minimize cumulative impacts on air quality.

Policy SCP-HS 2 **-** Within the Academic Growth Boundary, emphasize concepts of appropriate integration of land uses, compact campus development patterns, and more efficient, higher density residential development to reduce automobile dependency and promote use of alternative transportation modes.

Strategy #2: Emphasize Transportation Alternatives and Transportation Demand Management to Reduce Automobile Dependency and Vehicle Emissions.

Policy SCP-HS 3 **-** Maintain and enhance the use of transportation alternatives and demand management to the extent allowed by law for the purpose of reducing automobile dependency, reducing trip generation, and reducing vehicle emissions.

Policy SCP-HS 4 **-** Promote the use of alternative fuel and propulsion systems for shuttle vehicles, other transit vehicles, construction and fleet vehicles.

Implementation Recommendation:

SCP-HS (i)1- Consider a program that would credit the use of electric, "hybrid" gas and electric, or other reduced-emission vehicles toward the "no net new commute trips" standard.

Strategy #3: Control Sources of Particulate Emissions.

Policy SCP-HS 5 **-** Reduce particulate matter pollution originating from road and building construction. Require all best management practices and feasible control measures through project conditions and mitigations, as appropriate.

Implementation Recommendation:

SCP-HS (i)2 **-** Require Stanford to use appropriate best management practices and other feasible mitigation for the reduction of particulate matter pollution during construction.

5.2.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the State CEQA Guidelines, the Project would have a significant impact on air quality if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

Approach to Analysis

The analysis of air quality impact in this EIR uses the thresholds and methodologies contained in the 2017 BAAQMD *CEQA Air Quality Guidelines* to determine the potential significant impacts of the proposed Project. The BAAQMD significance thresholds are divided between criteria air pollutants and TACs, and are set for evaluating a project's short-term construction emissions, long-term operational emissions, and contributions to cumulative impacts to determine whether such contributions are cumulatively considerable.

Criteria Air Pollutants

The BAAQMD significance thresholds for criteria air pollutants are summarized in **Table 5.2-6**. Generally, the BAAQMD significance thresholds for criteria air pollutants address the significance criteria a) through c). Projects that would result in criteria pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB. Both of these thresholds (average daily and maximum annual) apply to operational emissions from a given project. Construction emissions are assessed solely with respect to the average daily thresholds, pursuant to BAAQMD guidance, because of the temporary nature of construction-related emissions (BAAQMD, 2017a).

The thresholds of significance for criteria air pollutants are based on substantial evidence presented in Appendix D of the 2011 BAAQMD CEQA Air Quality Guidelines and BAAQMD's 2009 *Revised Draft Options and Justification Report* concerning CEQA thresholds (BAAQMD, 2009).

TABLE 5.2-6
BAAQMD CEQA THRESHOLDS OF SIGNIFICANCE FOR CRITERIA AIR POLLUTANTS

Air Pollutants (and Precursors)	Construction-Related Average Daily Emissions (Lbs/Day)	Operational-Related	
		Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROGs	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust only)	82	15
$PM_{2.5}$	54 (exhaust only)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
CO (local concentration)	None	9.0 ppm (8-hour average) 20.0 ppm (1-hour average)	

SOURCE: BAAQMD, 2017a

Fugitive dust emissions are typically generated during construction phases. Studies have shown that the application of best management practices (BMPs) at construction sites substantially controls fugitive dust (WRAP, 2006); individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent (BAAQMD, 2009). The BAAQMD has identified eight BMPs to control fugitive dust emissions from construction activities.

Regional concentrations of CO in the Bay Area have not exceeded the State or federal standards in over 23 years. The primary source of CO emissions from development projects is vehicle traffic. Construction-related CO emissions represent less than 5 percent of the Bay Area total basin-wide CO emissions. As discussed previously, the Bay Area is in attainment for both CO and SO_2. Furthermore, the BAAQMD has demonstrated, based on modeling, that to exceed the California ambient air quality standard of 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited). Consequently, intersection volumes in the project vicinity are used relative to these screening criteria to assess the potential for significant CO concentrations.

Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit TACs. Analysis of endemic toxic substances that may become airborne such as naturally occurring asbestos is assessed in Section 5.8, *Hazards and Hazardous Materials*.

To assist lead agencies in evaluating air quality impacts at the community scale, BAAQMD developed thresholds of significance for local community risks and hazards associated with TACs and $PM_{2.5}$ with respect to siting a new source and/or receptor, as well as for assessing both individual source and cumulative multiple source impacts. These thresholds of significance focus

on $PM_{2.5}$ and TACs because these more so than other emission types may pose significant adverse health impacts at the local level as discussed separately below.

TACs and $PM_{2.5}$ are evaluated based on the health impacts that may result from the emissions of TACs and localized concentration of $PM_{2.5}$. The health impacts associated with TACs are quite diverse and, as discussed earlier in this section, generally are assessed locally, rather than regionally.

For the purposes of impact assessment, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological impacts associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis by the State OEHHA.

Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels. The thresholds of significance for local community risk and hazard impacts are identified below. If Project-related emissions of TACs or $PM_{2.5}$ exceed any of the following thresholds, the Project would result in a significant adverse impact:

- An excess cancer risk level of more than 10-in-1 million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a significant cumulatively considerable contribution; or
- An incremental increase of greater than 0.3 microgram per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ from a single source would be a significant cumulatively considerable contribution.

Cancer risks, and acute and chronic hazard indices, are calculated from the estimated concentrations of pollutants in the air and the potential for exposure of people to these pollutants. That process is known as risk assessment. Concentrations in the air are calculated from TAC emissions using air dispersion modeling. Air dispersion modeling is the mathematical estimation of pollutant impacts from emissions sources within a study area. Information on factors that affect the fate and transport of pollutants in the atmosphere, including meteorological conditions, site configuration, emission release characteristics, and surrounding terrain, is used in the dispersion model. Once concentrations are calculated using air dispersion modeling, the risks are calculated using information on how much air people breathe and the toxicity of the chemical considered. The resulting cancer risks and chronic and acute hazard index, as described above, are compared to the BAAQMD significance thresholds to assess significance.

In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015,[8] the California Supreme Court held that CEQA does not generally require

[8] *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal.4th 369. Opinion Filed December 17, 2015.

lead agencies to consider how existing environmental conditions might impact a project's users or residents, except where the proposed project would exacerbate an existing environmental condition. Accordingly, the identified significance criteria related to exposure of sensitive receptors to substantial pollutant concentrations are valid only to the extent that the proposed Project would in some way exacerbate air quality conditions. For this EIR, air quality impacts on the proposed sensitive receptors were considered in the context of the contributions from Project emissions.

Odors

With respect to odors, the significance threshold used is the screening distance approach. The BAAQMD 2012 CEQA Guidelines provide guidance in the form of screening distances, to help evaluate potential odor impacts. They identify potential odor sources of particular concern, such as wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations and metal smelters, and recommend buffer zones around them to avoid potential odor conflicts.

Impact Evaluation

Construction Impacts

Impact 5.2-1: Project construction would not result in emissions of NOx, PM, and ROGs that would exceed BAAQMD significance thresholds. (*Less than Significant*)

Construction of individual projects developed under the proposed 2018 General Use Permit would generate construction emissions from a variety of sources, including off-road construction equipment and on-road worker, vendor, and hauling vehicles. Because project-specific information is not available, the construction schedule, off-road equipment lists, and equipment specifications for the construction scenario analyzed in this EIR use CalEEMod default values[9]. Further, because the amount of construction would fluctuate from year to year, and throughout any given year, emissions from proposed Project construction activity were estimated for both an average construction scenario and a peak construction scenario.

The average construction scenario assumed construction of an annual average of approximately 225,500 square feet of new building construction, 50,300 square feet of building demolition, and excavation of approximately 62,100 cubic yards of soil per year, with the default start and end dates of the sub-phases of construction moved such that the annual construction activities occur each year while maintaining the total default number of equipment-hours. This annual average is based on the average annual construction and demolition that occurred on the Project site under the 2000 General use Permit from fiscal year 2001 to 2015. When projecting this constant annual

[9] Default values are those populated by the computer in lieu of project-specific information. The CalEEmod model populates default values for construction phasing and equipment based on the input acreage of construction area. These assumptions are based on a construction activity survey performed by the South Coast Air Quality Management District.

construction activity forward from 2018 to 2035, the total construction square footage would be similar to that anticipated in the proposed 2018 General Use Permit.

Annual demolition square footage under the proposed 2018 General Use Permit is likely to be lower than under the 2000 General Use Permit because most of the in-fill development that occurred under the 2000 General Use Permit was in the denser core campus, whereas much of the proposed 2018 General Use Permit development would be likely to occur as redevelopment at the less dense fringes or on parking lots. As a result, the construction emissions analysis is conservative because less demolition (and thus, less demolition-related construction emissions) would be likely to occur under the 2018 General Use Permit than is assumed in this analysis.

The peak construction scenario was derived from one of the largest construction projects to occur at Stanford under the 2000 General Use Permit - the EV Graduate Residences.[10] The peak construction scenario for the proposed Project analyzed in this EIR is assumed to begin in year 2023, five years after commencement of the proposed 2018 General Use Permit. Given the time that it will take Stanford to complete construction of the EV Graduate Residences (see 2018 Environmental Baseline, above) and for the County to permit any new large Stanford project under the proposed 2018 General Use Permit, 2023 is reasonably assumed to be the earliest year that a peak construction project under the proposed 2018 General Use Permit would begin.

On-road worker, vendor, and hauling emissions for the average and peak construction scenarios are calculated using EMFAC2014. All other emissions for the average and peak construction scenarios are quantified using the CalEEMod emissions estimator model (see Appendix AQT-REV). Off-road equipment emissions assume that under the proposed 2018 General Use Permit, Stanford would meet final Tier 4 standards for all construction equipment, except for chainsaws and paving phase equipment, as discussed in Chapter 3, Project Description.

Table 5.2-7 presents estimated average daily construction emissions for both the average and peak construction scenarios under the proposed 2018 General Use Permit. Daily Project construction emissions (in pounds per day) were calculated by dividing the total criteria air pollutant emissions by the number of working days. For the average construction scenario, the daily emissions were the annual emissions divided by 260 days. For the peak construction scenario, the daily emissions were the total emissions divided by 780 days, since the peak construction scenario is modeled over three years.

As shown in Table 5.2-7, average daily construction emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under both the average and peak construction scenarios would be below the respective thresholds for these pollutants. Consequently, construction-related emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under the proposed 2018 General Use Permit would be less than significant.

Mitigation: None required.

[10] The peak construction scenario reflects a construction site of approximately 18 acres, and a density of about 180,000 square feet of development per acre of construction site, with construction occurring over a 3-year period.

TABLE 5.2-7
2018 GENERAL USE PERMIT AVERAGE DAILY CONSTRUCTION EMISSIONS

Pollutant	Average Daily Emissions (pounds/day)			
	ROG	NOx	Exhaust PM_{10}[a]	Exhaust $PM_{2.5}$[a]
	Project Average Construction Scenario			
Emissions	14.9	22.0	2.8	1.3
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
	Project Peak Construction Scenario			
Emissions	51.3	41.8	1.1	1.0
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No

NOTES:
[a] Exhaust PM for the Project average and peak construction scenarios includes tire wear and brake wear PM for on-road vehicles. The BAAQMD Thresholds do not include these sources so the comparison is conservative.

SOURCE: Ramboll Environ, 2017.

Impact 5.2-2: Project construction would generate fugitive dust that could result in a localized increase in particulate matter. (*Significant)*

Demolition, excavation, grading, and other construction activities associated with individual projects developed under the proposed 2018 General Use Permit may cause wind-blown dust that could contribute PM into the local atmosphere. Construction-related dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, dust generated from construction activities may result in significant adverse impacts on a temporary and intermittent basis during the construction period.

The BAAQMD's recommended approach to analysis of construction-related particulate impacts (other than exhaust PM) is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. The BAAQMD considers construction-related fugitive dust impacts of projects to be less than significant if a suite of recommended dust-control measures is implemented. Therefore, BAAQMD-identified Best Management Practices for control of fugitive dust are included as **Mitigation Measure 5.2-2**, below. BAAQMD notes that individual best management practices have been shown to reduce fugitive dust by anywhere from 30 percent to more than 90 percent, and concludes that projects that implement construction best management practices will reduce fugitive dust emissions to a less-than-significant level (BAAQMD, 2017a). Accordingly, the Project construction effects on fugitive dust generation would be less than significant with implementation of Mitigation Measure 5.2-2.

Mitigation Measure 5.2-2: *Best Management Practices for Controlling Particulate Emissions.* Stanford shall require all construction contractors to implement the following measures:

- All exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day;
- All haul trucks transporting soil, sand or other loose material off-site shall be covered;
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweepers is prohibited;
- All vehicle speeds on unpaved roads shall be limited to 15 mph;
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. Clear signage shall be provided for construction workers at all access points;
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible emissions evaluator; and
- Post a publicly visible sign with the telephone number and person to be contacted regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Less than Significant.

Impact 5.2-3: Project construction would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

Site preparation activities, such as demolition, excavation, grading, foundation construction, and other ground-disturbing construction activities associated with individual projects developed under the proposed 2018 General Use Permit would affect localized air quality. Emissions from construction equipment during these site preparation activities would include directly emitted particulate matter ($PM_{2.5}$ and PM_{10}) and TACs such as diesel particulate matter (DPM). The generation of these emissions during construction could expose sensitive receptors to substantial pollutant concentrations of TACs, resulting in a localized health risk.

Because individual projects under the 2018 General Use Permit are not known at this time, it is not possible to conduct a health risk assessment (HRA) for construction related to each of these

individual projects that would occur under the Project. Accordingly, a screening tool was developed as part of the health risk analysis to ensure construction activities that occur under the proposed 2018 General Use Permit would not result in emissions of toxic air contaminants exceeding BAAQMD health risk significance thresholds. Development of this screening tool Conservatively, all particulate matter exhaust less than 10 micrometers in diameter (i.e., PM_{10}) is assumed to be DPM for purposes of health risk calculations.

The screening tool is based on a HRA described in the Air Quality Technical Report (see Appendix AQT-REV) based on the EV Graduate Residences project, which reflects the largest quantity of earth moving and the largest amount of above and below ground construction that Stanford has undertaken for a single project under the 2000 General Use Permit. Stanford indicates the EV Graduate Residences construction project is likely to be larger than any individual project that would be constructed under the 2018 General Use Permit. This analysis has been adapted to evaluate a variety of potential project sizes and distances from sensitive receptors by scaling down the equipment and intensity developed for an HRA analysis performed for EV Graduate Residences project. Development of this screening tool utilized the methodologies for health risk assessment published by OEHHA in 2015 and BAAQMD in 2016.

Table 5.2-8 below presents the screening distances developed to determine the circumstances in terms of construction project size and distance from receptors under which a significant construction-related health risk may occur. Although the precise location of future individual projects is not known, because construction projects could occur closer to sensitive land uses than the screening distances shown in Table 5.2-8, the proposed 2018 General Use Permit could potentially result in a significant health risk impact.

TABLE 5.2-8
CONSTRUCTION HEALTH RISK SCREENING DISTANCES

Maximum Project Size	Minimum Distance (feet) to Nearest Receptor Type		
	Childcare Facility	Child Resident	Adult Resident
3.27 million square feet with up to 900,000 CY of debris/soil export	460	165	33
540,000 square feet with up to 150,000 CY of debris/soil export	165	33	33
180,000 square feet with up to 50,000 CY of debris/soil export	100	33	33
45,000 square feet with up to 12,500 CY of debris/soil export	33[a]	33	33

NOTES:
[a] The screening tool stipulates that a 33-foot buffer must exist around the construction site fence line where no sensitive receptor resides. If a construction site is within the 33-foot buffer from sensitive receptors, or directly adjacent to a childcare facility, the project must both comply with the screening limits presented above and restrict diesel-powered operations to when children are not present in order to screen out of conducting a health risk analysis.

SOURCE: Ramboll Environ, 2017.

Implementation of **Mitigation Measure 5.2-3(a)** would require Stanford to conduct a health risk screening of individual projects developed under the proposed 2018 General Use Permit, and if applicable, **Mitigation Measure 5.2-3(b)** would require a project-specific health risk analysis to demonstrate that the project construction activities would not result in a significant acute, chronic non-cancer or cancer-related health risk to specific sensitive receptors. Implementation of Mitigation Measures 5.2-3(a)-(b) would ensure potential exposure of sensitive receptors to substantial pollutant concentrations or health risk from construction activities under the proposed 2018 General Use Permit would be less than significant.

> **Mitigation Measure 5.2-3(a):** *Health Risk Screening for Construction Projects.* Prior to approval of an individual project, Stanford shall conduct a project-specific health risk screening using the screening distances presented in Table 5.2-8 and submit it to the County Planning Office for peer review and approval. If the individual project is located further from sensitive receptors than the minimum distance identified in Table 5.2-8, then no further construction health risk assessment or additional mitigation is required. If the construction project is closer than the specified minimum distance, then a project-specific Health Risk Assessment shall be prepared, as outlined in Mitigation Measure 5.2-3(b).
>
> **Mitigation Measure 5.2-3(b):** *Project-Specific Health Risk Analysis.* If the screening criteria in Table 5.2-8 are not met, Stanford shall prepare and submit to the County Planning Office for peer review and approval a project-specific health risk analysis demonstrating that project construction activities will not result in a significant acute, chronic non-cancer or cancer-related health risk to sensitive receptors. As a performance standard, any subsequent project-specific health risk analysis must demonstrate an excess cancer risk level of 10-in-1 million or less, a non-cancer (i.e., chronic or acute) hazard index of 1.0 or less, and an incremental increase an annual average $PM_{2.5}$ concentration of no more than 0.3 microgram per cubic meter.
>
> **Significance after Mitigation:** Less than Significant.

Operational Impacts

Impact 5.2-4: Project operational emissions from new development would not result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. (*Less than Significant)*

The proposed 2018 General Use Permit would generate operational emissions from a variety of sources, including new vehicle trips, operation of boilers, maintenance operation of diesel emergency generators; new laboratories; fueling stations; and off-road sources from Stanford maintenance equipment and construction activities. The Air Quality Technical Report included in Appendix AQT-REV contains a detailed inventory of operational emissions under the proposed Project. The operational criteria air pollutant inventory analysis in the Air Quality Technical Report uses USEPA emission factors to estimate emissions from the emergency generators and boilers. Vehicle trip emissions were calculated using EMFAC2014 and entrained roadway dust emissions factors from CARB, based on vehicle trip generation rates developed for the proposed

Project described in Section 5.15, Transportation and Traffic. Vehicle emissions associated with average annual construction activity are also included.

Table 5.2-9, below, presents the total maximum annual emissions of criteria air pollutants in the study area in 2035 with buildout of the proposed 2018 General Use Permit.

TABLE 5.2-9
TOTAL OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS IN 2035 WITH BUILDOUT OF THE 2018 GENERAL USE PERMIT

Source	ROG	NOx	PM10	PM2.5[a]
	Maximum Annual Emissions (Tons Per Year)			
Mobile Sources	19	15	39	9.5
Hot Water Generators	0.40	0.74	0.47	0.47
Steam Plant	0.29	1.0	0.40	0.40
Natural Gas Boilers	1.3	23	1.8	1.8
Emergency Generators	0.47	9.0	0.26	0.26
Laboratories	19	--	--	--
Fuel Stations	0.04	--	--	--
Total[b]	40	49	42	12

NOTES:
[a] $PM_{2.5}$ from non-mobile sources conservatively assumed to be equivalent to PM_{10} value.
[b] Emission totals may not appear to total due to rounding.

SOURCE: Ramboll Environ, 2018

Table 5.2-10, below, presents the net change in maximum annual and average daily criteria air pollutant emissions in the study area between the 2018 baseline and 2035 with buildout of the proposed 2018 General Use Permit. Emissions of ROG and NOx would decrease by 2035 compared to the 2018 environmental baseline, largely as a result of improvements to the motor vehicle fleet due to more stringent emission standards; as well as the proposed electrification of Stanford's Marguerite bus fleet and 70 percent of its Lands, Buildings and Real Estate (LBRE) and Bonair vehicle fleets by 2035. Emissions of PM_{10} and $PM_{2.5}$ are predicted to increase due primarily to exhaust and entrained roadway dust emissions that would result from increased VMT that would not be reduced as much as ROG or NOx by predicted emission improvements in tailpipe emissions or proposed electrification. As can be seen from Table 5.2-10, emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ would all be below BAAQMD thresholds. Accordingly, Project criteria air pollutant emissions would result in a less-than-significant impact.

Mitigation: None required.

TABLE 5.2-10
NET CHANGE IN MAXIMUM ANNUAL AND AVERAGE DAILY OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS

Pollutant:	ROG	NOx	PM_{10}	$PM_{2.5}$[a]
Maximum Annual Emissions (Tons Per Year)				
Total 2018 Baseline Emissions	47	82	33	10
Total Emissions in 2035 with Buildout of 2018 General Use Permit	40	49	42	12
Net Change in Emissions[b]	-7	-32	+9.4	+2.3
Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Average Daily Emissions (Pounds Per Day)				
Total 2018 Baseline Emissions	256	447	181	55
Total Emissions in 2035 with Buildout of 2018 General Use Permit	220	270	232	68
Net Change in Emissions	-36	-178	+52	+13
Threshold	54	54	82	54
Above Threshold?	No	No	No	No

NOTES:
[a] $PM_{2.5}$ from non-mobile sources conservatively assumed to be equivalent to PM_{10} value.
[b] Emission totals may not appear to total due to rounding.

SOURCE: Ramboll Environ, 2018

Impact 5.2-5: Project operation of development would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant*)

The proposed 2018 General Use Permit would result in development that would generate operational emissions of TACs and localized contributions to $PM_{2.5}$ concentrations from a variety of sources, including emissions from passenger vehicles and delivery vehicles, diesel generators, laboratory fume hood stacks and, to a lesser extent, natural gas combustion.

Mobile Source Air Toxics

Mobile source air toxics are emitted from vehicles and are compounds that are known or suspected to cause cancer or other serious health and environmental effects. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter (DPM). TAC emissions from mobile sources would be reduced under the proposed Project compared to 2018 environmental baseline conditions, resulting in a reduction of health risks from mobile sources.

While the proposed Project would result in a marginal increase in $PM_{2.5}$ emissions as discussed in Impact 5.2-4, above, this increase is a basin-wide increase primarily resulting from exhaust emissions resulting from increased Vehicle Miles Traveled (VMT). At the local level, roadway

volumes are predicted to increase from 0 to 12 percent over 2018 baseline conditions. Using El Camino Real as a proxy and the BAAQMD's screening calculator for roadway emissions, the predicted increase in vehicles along El Camino Real would result in an increased $PM_{2.5}$ concentration of 0.02 µg/m3 at 100 feet. This increase is below BAAQMD's significance threshold of 0.3 µg/m3 for project-level contributions to localized concentrations of $PM_{2.5}$. Consequently, the proposed Project is considered to have a less-than-significant impact with regard to health risks from mobile sources.

Diesel Emergency Back-up Generators Air Toxics

New diesel emergency back-up generators would be required for some buildings constructed under the proposed 2018 General Use Permit as a safety requirement. Any new diesel generators larger than 50 horsepower would require a permit from the BAAQMD and must comply with the Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines. As a practical matter, the BAAQMD will not issue a permit for a new generator that results in an operational cancer risk greater than 10 in one million. Accordingly, health risk impacts from new emergency generators would be considered less than significant.

Laboratory Air Toxics

The potential for additional laboratories to be developed under the proposed 2018 General Use Permit would also result in the potential for increases in chemical usage associated with those uses. The Project emissions inventory assumes that chemical usage would increase proportionate to the increase in new academic and academic support square footage. Chemical usage across all laboratories from full buildout of the proposed 2018 General Use Permit was compared to 2018 environmental baseline emissions. The resulting incremental difference in emissions was used to calculate the potential cancer risk, and non-cancer acute and chronic health risks associated with implementation of the proposed Project. This risk estimation conservatively assumes all receptors are sensitive populations being maximally exposed (as a resident). Additionally, under the proposed Project, incremental increases for all laboratory chemicals were assumed to be emitted from one stack instead of various stacks spread across campus; this is a conservative assumption that likely overestimates concentrations at the nearest receptor.

TAC emissions dispersion was predicted in a model accounting for local meteorological conditions. Further details on the methods for risk estimation for laboratories can be found in the Appendix AQT-REV. Using these conservative assumptions, the incremental increase in cancer risk associated with the Project is calculated to be 4.5 in one million, which is well below the BAAQMD significance threshold of 10 in a million. Acute and chronic hazard indices (HIs) would increase by 0.03 and 0.01, respectively, which are also below the BAAQMD significance threshold of 1.0. Therefore, the Project's impacts on health risks from laboratory TAC emissions would likely be less than significant.

Notwithstanding the analysis presented above, limitations of the health risk assessment prepared at this stage may not account for development under the 2018 General Use Permit that may involve substantial amounts of laboratory space and fume hoods. BAAQMD's Rule 2-1 exempts teaching laboratories used exclusively for classroom experimentation and/or demonstration. Given the

potential for future development under the proposed 2018 General Use Permit to include both teaching laboratories as well as research laboratories, the potential exists that the requirements of Rule 2-1 may not apply. Consequently, the potential health risks from laboratory TAC emissions is considered potentially significant. Accordingly, **Mitigation Measure 5.2-5**, below, is identified to ensure that substantial amounts of laboratory space would not result in a significant health risk.

Natural Gas Combustion. Natural gas combustion results in emissions of benzene, formaldehyde, and toluene. Under the proposed 2018 General Use Permit, there would be an incremental increase in these TAC emissions due to an increase in natural gas combustion associated with residential and non-residential growth. However, these increases would be marginal (net change of 0.29 lb/yr of benzene, 10.3 lb/yr of formaldehyde, and 0.47 lb/yr of toluene), and any new natural gas boilers would need to be permitted and comply with any applicable BAAQMD standards. Therefore, health risk impacts from natural gas combustion resulting from development under the proposed 2018 General Use Permit would be less than significant.

> **Mitigation Measure 5.2-5:** *Laboratory Fume Hood Emission Control*. For any individual project that contains more than 25,000 square feet of emissions-generating laboratory space within a building and 50 fume hoods, Stanford shall conduct a health risk screening analysis and obtain a permit from the BAAQMD for the proposed individual project; this permit may be required either prior to or as a condition of approval of the proposed individual project. In accordance with BAAQMD Rules 2-1 and 2-5, new sources of emissions must implement Best Available Control Technology for Toxics (T-BACT) if individual source risks exceed 1.0 in a million for cancer and/or chronic hazard index is greater than 0.20. Additionally, a permit will be denied if project cancer risk exceeds 10.0 in a million or if the chronic or acute hazard index exceeds 1.0. Compliance with BAAQMD rules will ensure that new laboratory operations will not result in a significant health risk impact.
>
> **Significance after Mitigation:** Less than Significant.

Impact 5.2-6: Proposed Project operations would not result in local concentrations of carbon monoxide that would exceed State and federal standards. (*Less than Significant*)

Development under the proposed 2018 General Use Permit would generate additional vehicle trips and associated emissions of CO along area roadways. BAAQMD provides a screening methodology based on peak hourly traffic volumes to evaluate potential impacts of CO emissions from mobile sources. This preliminary screening procedure provides a conservative indication of whether the proposed Project would result in the generation of CO concentrations that would substantially contribute to an exceedance of the thresholds of significance. If all of the screening criteria are met, the proposed Project would result in a less-than-significant impact to air quality with respect to concentrations of local CO.

The screening methodology focuses on intersections with vehicle traffic exceeding 44,000 vehicles per hour after Project buildout (or 24,000 vehicles per hour in locations with limited vertical or horizontal air mixing) that could violate or contribute to a violation of ambient air quality standards for CO. The analysis presented in Section 5.15, Transportation and Traffic,

studied 95 intersections in the transportation study area. A review of vehicle volumes for these intersections with buildout of the proposed Project in 2035 indicates that the greatest total intersection volumes would occur at the intersection of Page Mill Road with El Camino Real during the p.m. peak hour with 8,573 vehicles. With buildout of the proposed Project in 2035, all study intersection volumes would be below the 24,000 vehicles per hour screening threshold. Thus, the proposed Project would not contribute to a violation of CO air quality standards.

Mitigation: None required.

Impact 5.2-7: Project operation of development would not create objectionable odors that would affect a substantial number of people. (*Less than Significant*)

The BAAQMD CEQA Guidelines identifies wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations and metal smelters as odor sources of particular concern, recommends buffer zones of one to two miles around them to avoid potential odor conflicts, and requires a BAAQMD permit. There are no facilities of these types in the vicinity of the Project site, and none are currently proposed or allowed under the proposed 2018 General Use Permit. The proposed Project provides for the development of new housing, academic, and academic support uses, and would not result in the development or operations of odor sources of concern. Consequently, the potential for the proposed Project to result in objectionable odors is less than significant.

Mitigation: None required.

Impact 5.2-8: Project operation of development could conflict with or obstruct implementation of the applicable air quality plan. (*Potentially Significant*)

In April 2017 the BAAQMD adopted the *2017 Clean Air Plan* (BAAQMD, 2017d). The 2017 Clean Air Plan's primary goals are to protect public health and protect the climate, and it contains 85 measures some of which address reduction of GHGs. These control strategies that are grouped into the following categories:

- Stationary source measures;
- Transportation control measures;
- Energy control measures;
- Building Control Measures;
- Agricultural control measures;
- Natural and working lands control measures;
- Waste management control measures;
- Water control measures; and
- Super GHG control measures.

The 2017 BAAQMD CEQA Guidelines identify a methodology to assess consistency with the Clean Air Plan be used to evaluate plan-level projects. This methodology is discussed in the chapter of the Guidelines applicable to long range plans (e.g., general plan, redevelopment plans, specific plans, area plans, community plans, regional plans, congestion management plans, etc.), but also states that it applies to project-level as well as plan-level analyses.

The 2017 BAAQMD CEQA Guidelines recommend the consideration of three questions:

- Does the project support the primary goals of the air quality plan?;
- Does the project include applicable control measures from the air quality plan?; and
- Does the project disrupt or hinder implementation of any Clean Air Plan control measures?

With regard to the first question, the BAAQMD CEQA Guidelines provide a basis for assessing support of the primary goals. The primary goals of the 2017 Bay Area Clean Air Plan are to:

- Attain all state and national air quality standards;
- Eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and
- Reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.

Any project (i.e., project or plan) that would not support these goals would not be considered consistent with the 2017 Clean Air Plan. If approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the 2017 Clean Air Plan. Based on the discussion presented in Impacts 5.2-1 through 5.2-7 above, development under the proposed 2018 General Use Permit would have a less-than-significant impact with regard to air quality with implementation of identified mitigation measures. If the proposed Project is approved and the mitigation measures identified in this EIR are imposed through the adoption of a Mitigation Monitoring Plan (pursuant to State CEQA Guidelines section 15097), the proposed Project would be considered consistent with the 2017 Clean Air Plan.

The second question recommended in the 2017 BAAQMD CEQA Guidelines for evaluating consistency with the 2017 Clean Air Plan is whether the project includes applicable control measures from the air quality plan. The 2017 Clean Air Plan includes 85 control measures to reduce emissions of PM, ozone precursors, and other air pollutants from a wide variety of emission sources. Forty of these measures address stationary sources and primarily direct the BAAQMD to adopt or revise rules and regulations and other air quality programs, and are therefore not directly applicable to implementation of the proposed 2018 General Use Permit.

The 2017 Clean Air Plan contains transportation control measures and measures related energy, green building, waste management, water control and control of short-lived GHGs. The measures applicable to criteria air pollutants, TACs, or greenhouse gases generated under the proposed 2018 General Use Permit are identified in **Table 5.2-11**. Table 5.2-11 identifies the control measure and

existing or proposed mechanisms that Stanford or surrounding local jurisdictions and transit agencies would have in place to implement these measures. As discussed in Chapter 3, Project Description, Stanford currently implements a number of programs and practices to promote sustainability at the campus, including Transportation Demand Management, energy supply and efficiency, water Supply and conservation, and solid waste reduction and recycling. Under the 2018 General Use Permit, Stanford commits to continue to implement, and update as needed, these sustainability programs and practices.

TABLE 5.2-11
2018 GENERAL USE PERMIT CONSISTENCY WITH APPLICABLE CONTROL MEASURES OF THE 2017 CLEAN AIR PLAN

Control Measure	Existing or Proposed Implementation Mechanism	Consistency of Proposed Project with Measure
TR1 – Clean Air Teleworking Initiative	Stanford provides on-line courses for many of its offerings. Remote computer access available for access available for most employees.	Yes
TR2 – Trip Reduction Programs	Stanford achieves Stanford Community Plan's "No Net New Commute Trips" standard through implementation of its Transportation Demand Management (TDM) programs; participation in off-campus trip reduction programs; and if needed, funding to the County for other programs to reduce trips. In addition, under the 2018 General Use Permit, if the No Net New Commute Trips standard cannot be achieved through trip reduction measures and trip credits alone, Stanford would optionally achieve the No Net New Commute Trips standard by funding trip reduction programs implemented by other entities in the vicinity, including programs that encourage and improve use of alternative transportation modes, and/or improve safety and mobility for pedestrians, bicyclists and transit users.	Yes, with implementation of existing TDM programs, and mitigation measures identified in this EIR
TR3 – Local and Regional Bus Service	Transit services within study area include Stanford Marguerite Shuttle, City of Palo Alto Shuttle, City of Menlo Park Shuttle, San Mateo County Transit District (SamTrans), Santa Clara Valley Transportation Authority (SCVTA) and Alameda-Contra Costa Transit District (AC Transit).	Yes
TR4 – Local and Regional Rail Service	Caltrain located within 0.5 miles of Project site, with Bay Area Rapid Transit District (BART) interconnection at Millbrae Station	Yes
TR5 – Transit Efficiency and Use	Stanford Marguerite shuttles, and City of Palo Alto and Menlo Park shuttles are free. Caltrain, SamTrans, SCVTA and AC Transit offer Clipper card capability.	Yes
TR7 – Safe Routes to Schools and Safe Routes to Transit	Under the 2018 General Use Permit, Stanford plans to construct several bicycle and pedestrian supportive projects on the Project site that are designed to serve local area student trips to the Nixon and Escondido Elementary Schools. Stanford proposes to construct the improvements on the Project site that have been identified by the Palo Alto Unified School District (PAUSD) and the City of Palo Alto as Suggested Routes to Schools. Circulation improvements on Stanford lands in and around Nixon and Escondido Elementary Schools could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, and wayfinding signs and additional traffic control. See also Bicycle and Pedestrian Access and Facilities, below.	Yes
TR8 - Ridesharing	TDM Program includes subsidized carpools and vanpools with expanded rideshare matching as well as subsidized car share memberships.	Yes

TABLE 5.2-11 (CONTINUED)
2018 GENERAL USE PERMIT CONSISTENCY WITH APPLICABLE CONTROL MEASURES OF THE 2017 CLEAN AIR PLAN

Control Measure	Existing or Proposed Implementation Mechanism	Consistency of Proposed Project with Measure
TR9 – Bicycle and Pedestrian Access and Facilities	Class I and II bicycle lanes are located on and adjacent to Project site. The cities of Palo Alto and Menlo Park also maintain a system of on-and off-road bicycle paths, lanes and routes. Sidewalks, crosswalks, and shared use paths serve the Project site. Pedestrian facilities are also present in the developed areas of Palo Alto and Menlo Park. Stanford provides abundant bicycle parking near high activity centers on the Project site. Stanford bicycle program includes safety education, financial incentives, and a community-based information exchange website. Stanford also provides a bicycle rental and lease program.	Yes
TR10 – Land Use Strategies	The proposed 2018 General Use Permit is consistent with the regional goals and targets expressed in the *Plan Bay Area Sustainable Communities Strategy. See* Appendix VMT.	Yes
TR13 - Parking Policies	Stanford's TDM Program includes parking permits and meters at all campus parking structures and lots. Anyone driving a vehicle to the campus must pay for parking. Stanford also maintains a parking policy prohibiting freshman students from having personal vehicles on campus.	Yes
TR14 – Cars and Light Trucks	Under 2018 General Use Permit, Stanford would implement 70 percent replacement of Stanford Land Buildings and Real Estate and Bonair vehicles with electric vehicles by 2035.	Yes
TR15 – Public Outreach and Education	Stanford's TDM Program includes webpage with resources for all modes of transportation along with educational resources; personalized commute planning service; eUpdates for Commute Club members; new employee orientation to transportation resources, and extensive promotional campaigns offering cash rewards and prizes.	Yes
TR19 – Medium and Heavy Duty Trucks	Under 2018 General Use Permit, Stanford would electrify all Marguerite buses by 2035.	Yes
TR22 – Construction, Freight and Farming equipment	Under 2018 General Use Permit, Stanford would meet final Tier 4 standards for all construction equipment, except for chainsaws and paving phase equipment.	Yes
EN1 – Decarbonize Electricity Production	Stanford purchases its electricity through a Direct Access program that enables purchase from providers that include renewable resources within their portfolios. Additionally, Stanford has committed to operate the Stanford Solar Generating Station that will provide half of campus electricity by renewable sources by the end of 2017.	Yes
EN2 – Decrease Electricity Demand	Stanford has recently implemented the following programs that serve to reduce electricity demand: Guidelines for Sustainable Buildings, Energy Retrofit Program, Whole Building Retrofit Program (WBERP), Energy Retrofit Program (ERP), Energy Conservation Incentive Program (ECIP), Building HVAC Recommissioning Program, and the Plug Load Energy Consumption Reduction program.	Yes
BL1 – Green Buildings	Stanford incorporates sustainability through its Guidelines for Life Cycle Cost Analysis, and Stanford's Guidelines for Sustainable Buildings, which adapt the USGBC's Leadership in Energy and Environmental Design (LEED) system and the US government's Labs21 guidelines to the university setting.	Yes
BL2 – Decarbonize Buildings	Implemented through replacement of cogeneration facility with SESI	Yes

TABLE 5.2-11 (CONTINUED)
2018 GENERAL USE PERMIT CONSISTENCY WITH APPLICABLE CONTROL MEASURES OF THE 2017 CLEAN AIR PLAN

Control Measure	Existing or Proposed Implementation Mechanism	Consistency of Proposed Project with Measure
BL3 – Market Based Solutions	Stanford has several programs to promote energy efficiency and conservation on campus. Stanford implements several energy-saving programs for building retrofits and users, including its WBERP, ERP, ECIP, and Building HVAC Recommissioning Program.	Yes
BL4 – Urban Heat Island	Stanford's Guidelines for Sustainable Buildings includes strategies for using microclimate and environmentally responsive design (e.g., designing sites to reduce "heat island" effects, such as using shading opportunities, use of high albedo materials; and pervious surfaces for parking, walkways, plazas, etc., and permeable paving for roads with infrequent use).	Yes
NW2 – Urban Tree Planting	As discussed in *Section 5.3 Biological Resources*, mitigation is identified requiring a 2:1 replacement of removed Oak Trees or a Conservation Easement to ensure that Project would not result in significant loss of oak woodland. This mitigation measure would also serve the purpose of the absorption of ambient criteria air pollutants as well as CO_2.	Yes, with implementation of Mitigation Measure
NW3 – Carbon Sequestration in Wetlands	Multiple mitigation measures identified in *Section 5.3 Biological Resources* to protect wetlands within the Project site. This mitigation would also serve the purpose of increasing carbon sequestration in wetlands.	Yes, with implementation of Mitigation Measure
WA3 – Green Waste Diversion; and WA4 – Recycling and Waste Reduction	Stanford implements a Waste Reduction and Recycling Program that serves all academic and athletic areas, student housing and dining, and faculty and staff housing, and construction sites. Stanford recycles plastics, metal, glass, paper, cardboard, construction and demolition debris, organic materials, such as yard trimmings and food scraps, and electronic scrap.	Yes
WR2 – Support Water Conservation	Stanford supports a number of efforts to reduce water use and promote water efficiency at the campus. Stanford's on-site water resources provide non-potable irrigation water to the campus. Stanford maintains a Water Conservation, Reuse and Recycling Master Plan, and is currently developing a Sustainable Water Management Plan to guide its long-term water supply development, water conservation, wastewater and storm-water management, and habitat conservation programs. Stanford also implements a Water Efficiency Program to decrease domestic water and improve water efficiency at the campus.	Yes

SOURCE: BAAQMD, Clean Air Plan, Spare the Air, Cool the Climate, 2017

These mechanisms would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. Because there are some control measures with which the Project as proposed may not be consistent, this impact is considered potentially significant. Where an implementation mechanism does not currently exist or is not identified in the proposed 2018 General Use Permit, mitigation measures identified in this EIR are identified to ensure consistency of the proposed 2018 General Use Permit with the 2017 Clean Air Plan.

With elements identified as part of the proposed 2018 General Use Permit, and implementation of mitigation measures identified in this EIR, the proposed Project would be consistent with applicable control measures from the 2017 Clean Air Plan.

The final basis for evaluation of consistency with the 2017 Clean Air Plan is whether the proposed Project would disrupt or hinder implementation of any 2017 Clean Air Plan control measure. With elements identified as part of the proposed 2018 General Use Permit, along with implementation of mitigation measures identified in this EIR, the proposed Project would not adversely affect implementation of any 2017 Clean Air Plan control measure.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 5.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 5.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

The following analysis addresses the potential cumulative air quality impacts associated with the proposed 2018 General Use Permit. The BAAQMD Air Quality Guidelines provide a methodology for assessing project-level odor impacts which are assessed in Impact 5.2-7, above. Because the proposed Project would not involve odor sources, there is no potential for the project to contribute considerably to a cumulative odor impact. Therefore, no cumulative assessment of odor impacts is required.

Similarly, Impact 5.2-8, above, addresses potential impacts with respect to consistency with the BAAQMD 2017 Clean Air Plan. Because the 2017 Clean Air Plan focuses on reducing population exposure to air pollutants throughout the region, the assessment in Impact 5.2-8 is a cumulative analysis as it assesses consistency with a region wide plan. Therefore, a separate cumulative assessment of consistency with the 2017 Clean Air Plan is not required.

Impact 5.2-9: The Project would not result in emissions of NOx, PM, or ROGs that are cumulatively considerable. (*Less than Significant*)

BAAQMD developed thresholds of significance for both construction and operation with consideration of individual project emission levels that would be cumulatively considerable. If a project exceeds the identified project significance levels, then its emissions would be cumulatively considerable. Table 5.2-7 shows that Project construction emissions would not exceed emission thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Table 5.2-11 shows that Project operational emissions would not exceed emission thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Therefore emissions of ROG, NOx, PM_{10} or $PM_{2.5}$ from the Project would not result in a cumulatively considerable contribution to a cumulative air quality impact.

Mitigation: None required.

Impact 5.2-10: The Project could considerably contribute to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

As discussed in Impact 5.2-3, because construction projects developed under the proposed 2018 General Use Permit could occur closer to sensitive land uses than the screening distances shown in Table 5.2-8 the proposed 2018 General Use Permit could potentially result in a significant health risk impact. Additionally, as discussed in Impact 5.2-5, the potential health risks from TACs from operation of laboratories are considered potentially significant. These represent potential impacts where the contribution of the project could also be cumulatively considerable. Consequently, mitigations measures are identified to address these potential impacts of the proposed Project.

Under the Community Air Risk Evaluation (CARE) program, the BAAQMD identified communities in the Bay Area subject to high TAC emissions, with sensitive populations that could be affected by them. The most recent CARE retrospective document (BAAQMD, 2014) indicates that there are no cumulatively impacted communities within five miles of the Project site. Given that the proposed Project contributions to localized health risk would be less than significant with mitigation, as described in Impact 5.2-3 and Impact 5.2-5 for both construction and operations, and that there are no impacted CARE communities in the Project vicinity, the Project's cumulative impact to local health risk and hazards would be reduced to less than significant with identified mitigation.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5.}$*

Mitigation Measure 5.2-5: *Laboratory Fume Hood Emission Control*

Significance after Mitigation: Less than Significant.

5.2.6 References

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5.3 Biological Resources

5.3.1 Introduction

This section addresses potential impacts to biological resources that would be caused as a result of implementation of the proposed 2018 General Use Permit. The section describes the existing environmental setting and 2018 baseline environmental setting for biological community types, wildlife, special-status plants, jurisdictional waters and wetlands within the Project site, and presents a discussion of applicable federal, State, and County regulations governing these resources. The section then evaluates potential impacts of the proposed Project on these biological resources, and identifies regulatory mechanisms and/or potentially feasible mitigation measures that could ensure potentially significant impacts to biological resources would be avoided or reduced in magnitude. This section relies in part on the Biological Resources Technical Report prepared by Stanford, in support of its 2018 General Use Permit application, and independently peer reviewed by ESA biologists (see Appendix BIO).

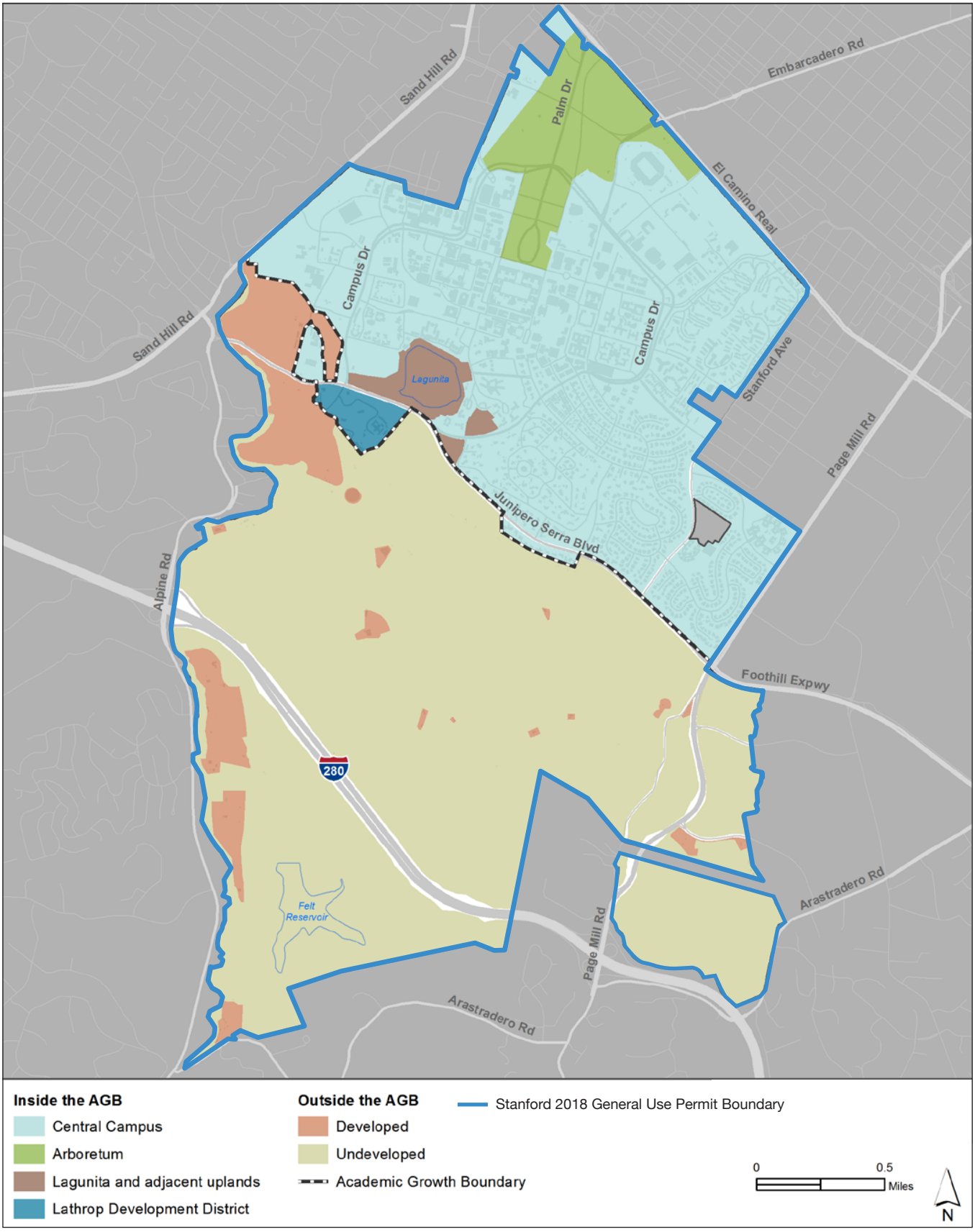
5.3.2 Existing Environmental Setting

As discussed in Chapter 3, Project Description, new building square footage and housing, as well as most infrastructure subject to the proposed 2018 General Use Permit, would be constructed on vacant land, infill sites and redevelopment sites within the Academic Growth Boundary. However, some infrastructure improvements and habitat improvements could occur outside the Academic Growth Boundary under the proposed 2018 General Use Permit. Accordingly, applicable biological resources present both within and outside the Academic Growth Boundary, and potential impacts to those resources, are addressed in this EIR.

This section describes the biological resources of the Project site that are located outside the Academic Growth Boundary separate from the areas of the Project site that are located within Academic Growth Boundary. In general, the areas of the Project site that are outside the Academic Growth Boundary have greater habitat value for special-status wildlife and plant species than those areas that are within the Academic Growth Boundary.

Biological Communities Outside the Academic Growth Boundary

Project site lands that are outside the Academic Growth Boundary are designated by the Stanford Community Plan as Open Space and Field Research and Special Conservation Areas (see Regulatory Setting, below, for discussion of Stanford Community Plan). As illustrated in **Figure 5.3-1**, biological resource areas on the Project site outside the Academic Growth Boundary are divided into geographic sub-areas that consist of undeveloped lands, and developed lands that include the Stanford Golf Course and other isolated facilities. The biological communities and habitat types within these areas are described below.



SOURCE: Stanford LRBE LUEP, 2017

Stanford 2018 General Use Permit . 160531

Figure 5.3-1
Stanford Biological Resource Areas

Annual and Perennial Grassland[1]

Annual and perennial grassland is a community type on the Project site outside the Academic Growth Boundary comprised primarily of nonnative annual grasses and forbs. Nonnative species dominating these areas include ripgut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), Italian rye (*Festuca perennis*), wild oat (*Avena fatua* and *A. barbata*), wall barley (*Hordeum murinum*), Italian thistle (*Carduus pycnocephalus*), storksbill (*Erodium species*), bristly ox-tongue (*Helminthotheca echioides*), purple star-thistle (*Centaurea calcitrapa*), yellow star-thistle (C. *solstitialis*), common groundsel (*Senecio vulgaris*), geranium (*Geranium* species) and milk thistle (*Silybum marianum*). Occasional individual oak trees or small, open-canopied groupings of oaks occur within this community type.

Several native grasses, most notably purple needlegrass (*Stipa pulchra*), form relatively dense patches that are common in some areas of these grasslands. Native forbs that commonly occur within this community include California poppy (*Eschscholzia californica*), California buttercup (*Ranunculus californicus),* blue-eyed grass (*Sisyrinchium bellum*), blue dicks (*Dichelostemma capitatum*), Ithuriel's spear (*Tritelia laxa*), yampa (*Perideridia kelloggii*), coyote thistle (*Eryngium jepsonii*) and mule's ear (*Wyethia augustifolia*).

These grasslands provide habitat for a diversity of terrestrial wildlife. Amphibians include western toad (*Anaxyrus boreas*), Sierran treefrog (*Pseudacris sierra*) and California tiger salamander (CTS) (*Ambystoma californiense*). Reptiles include the western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and western racer (*Coluber constrictor*).

A variety of bird species are at least seasonally present in these grasslands. Avian seedeaters, including western meadowlark (*Sturnella neglecta*), nest in grazed annual grasslands, while other grassland species, such as red-winged blackbird (*Agelaius phoeniceus*), are more likely to nest in taller, ungrazed vegetation. Many other species, including American goldfinch (*Carduelis tristis*), California towhee (*Pipilo crissalis*), loggerhead shrike (*Lanius ludovicianus*), and northern mockingbird (*Mimulus polyglottos*), nest in scattered shrubs throughout annual grasslands. Raptors, including white-tailed kite (*Elanus caeruleus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), and American kestrel (*Falco sparverius*), nest in nearby trees and forage in grasslands. Burrowing owls (*Athene cunicularia*) have not been observed nesting at Stanford for nearly a century, but over winter at several locations. Aerial foragers, including northern rough-winged swallow (*Stelgidopteryx serripennis*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*T. thalassina*), cliff swallow (*Petrochelidon pyrrhonota*), barn swallow (*Hirundo rustica*), and white-throated swift (*Aeronautes saxatilis*), also may frequent annual grasslands. Great blue herons (*Ardea herodias*) and great egrets (*A. alba*) are frequently observed foraging in these grasslands.

[1] The communities identified in this document are based on the State's Natural Communities definitions (which incorporate a number of other sources, including the California Native Plant Society). The definitions used by the Stanford Conservation Program are slightly modified from the original sources in order to account for local conditions (primarily species present and spatial extent) and be useful for the Stanford's conservation planning.

Small mammals that forage on the plants found in this habitat type include deer mice (*Peromyscus* species), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), California ground squirrel and Botta's pocket gopher (*Thomomys bottae*). Larger mammals, such as bobcat (*Lynx rufus*), coyote (*Canis latrans*), opossum (*Didelphis virginiana)*, raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), black-tailed jackrabbit (*Lepus californicus*), and black-tailed deer *(Odocoileus hemionus*), also use the annual grasslands, though other habitats are generally required for cover. Badgers (*Taxidea taxus*) are rarely sighted at Stanford and other areas of the southeastern portion San Francisco Peninsula, but may be increasing in numbers and distribution. Mountain lions (*Felis concolor*) are occasionally reported from the grasslands, riparian zone and woodlands of the lower foothills region.

Oak Woodland/Savannah

While oaks grow in abundance across the entire Project site, the only biologically functional oak woodlands/savannahs occur where natural processes, such as regeneration and mortality, are occurring. These natural processes occur in the undeveloped areas of the Project site outside the Academic Growth Boundary and within parts of the Lathrop Development District; see discussion of Biological Communities Within the Academic Growth Boundary, below). Accordingly, the oaks growing in open space on the Project site outside the Academic Growth Boundary are considered an Oak Woodland/Savannah community.

The oak woodland/savannah community is dominated by a mix of coast live oaks (*Quercus agrifolia*), blue oaks (*Q. douglasii*), valley oaks (*Q. lobata*), and California buckeye (*Aesculus californica*). Understory species include shrubs such as poison oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*), common snowberry (*Symphoricarpos albus*), blue elderberry (*Sambucus nigra*), western leatherwood (*Dirca occidentalis*), and occasional dense patches of coyote brush *(Baccharis pilularis*) along the edges of the woodland. Common grass species and herbs found beneath the oak woodland canopy include the nonnative species ripgut brome, wide-leaf filaree (*Erodium botrys*), soft chess, Italian rye, Italian thistle and soft geranium (*G. dissectum*), as well as native species including bedstraw (*Galium angustifolium*), Indian lettuce (*Claytonia parviflora*), and goldenback fern (*Pentagramma triangularis*). In many instances, nonnative plants dominate the understory vegetation in oak woodlands.

The wildlife typically associated with the oak woodlands include: bobcat, gray fox (*Urocyon cinereoargenteus*), western gray squirrel (*Sciurus griseus*), California ground squirrel (*Otospermophilus beecheyi*), black-tailed deer, deer mice, San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), broad-footed mole (*Scapanus latimanus)*, acorn woodpecker (*Melanerpes formicivorus*), band-tailed pigeon (*Columba fasciata*), northern flicker (*Colaptes aurantus*), and western scrub jay (*Aphelocoma californica*). Oak trees and other hardwoods in this community provide shelter, shade and breeding habitat for mammal species such as raccoon, striped skunk (*Mephitis mephitis*), and Audubon's cottontail (*Sylvilagus audubonii*).

The abundant insect and plant life present in the oak woodlands provide food for bird species such as white-breasted nuthatch (*Sitta carolinensis*), California thrasher (*Toxostoma redivivum),* bushtit (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), dark-eyed junco (*Junco hyemalis*), blue-gray gnatcatcher (*Polioptila caeurlea*), Bewick's wren (*Thryomanes bewickii*), spotted towhee

(*P. maculatus*), California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), and ash-throated flycatcher (*Myiarchus cinerascens*). A wide variety of woodpecker species are primary-cavity nesters in oak trees, while house wren (*Troglodytes aedon),* western bluebird (*Sialia mexicana*), and American kestrel (*F. sparverius*) are secondary-cavity nesters (e.g., utilizing abandoned woodpecker cavities). Oak woodland also is important to neotropical migrant songbirds (e.g., warblers, vireos, grosbeaks) providing feeding, resting and nesting habitats. Raptors that nest and forage in the oak woodland habitat include great horned owl (*Bubo virginianus*), barn owl, western screech-owl (*Otus kennicotti*), red-tailed hawk, and red-shouldered hawk (*B. lineatus*). Cooper's hawk (*Accipiter cooperi*), white-tailed kite (*E. leucurus)*, and golden eagle (*Aquila chrysaetos)* are additional special-status bird species that have been recorded in woodlands and grasslands of the Stanford foothills.

More than ten species of bats are common in the vicinity of the Project site; individuals of some species roost in tree cavities. Townsend's big-eared bats (*Corynorhinus townsendii*) are occasionally recorded on the Project site and likely utilize local woodlands and riparian areas on a regular basis, at least for foraging.

Amphibian and reptile species that are found in the oak woodlands include: Californina Tiger Salamander (CTS), western toad, Sierran treefrog, California slender salamander (*Batrachoseps attenuatus*), arboreal salamander (*Aneides lugubris*), sharp-tailed snake (*Contia tenuis*), ringneck snake (*Diadophis punctatus*), California kingsnake (*Lampropeltis getulus californiae*), gopher snake, western racer, western skink (*Plestiodon skiltonianus*), western fence lizard, and southern alligator lizard (*Elgaria multicarinata)*. It is likely that California red-legged frog (CRLF) (*Rana draytonii*) regularly traverse many of the oak woodlands.

Riparian Woodland and Creeks

Riparian woodland is located along Matadero Creek, Deer Creek and the creeks in the San Francisquito watershed. Vegetation along the creeks consists primarily of a moderately closed canopy of valley oak, coast live oak, and California buckeye that ranges from approximately 20 to 40 feet in height. Associated species within this community include bay (*Umbellularia californica*), redwood (*Sequoia sempervirens*), willow (*Salix* species) and white alder (*Alnus rhombifolia*). An understory shrub layer occurs beneath much of the riparian canopy, particularly in areas where gaps in the overstory allow direct sunlight. Shrub species present include poison oak (*Toxicodendron diversilobum*), California rose (*Rosa californica*), blackberry (*Rubus ursinus*), common snowberry (*Symphoricarpos albus*), blue elderberry, and coyote bush.

Small clumps of native and nonnative grasses and forbs are present in the understory of the riparian woodland. Aquatic vegetation found intermittently along the creek channels includes water cress (*Rorippa nasturtium-aquaticum*), iris-leaved juncus (*Juncus xiphioides*), broad-leaved cattail (*Typha latifolia*), and curly dock (*Rumex crispus*).

Riparian woodland provides abundant food, cover and breeding habitat for wildlife. Bird species associated with this habitat include California quail, mourning dove, orange-crowned warbler (*Vermivora celata*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), black-crowned night heron (*Nycticorax nycticorax*), belted kingfisher (*Ceryle alcyon*), western

wood-pewee (*Contopus sordidulus*), California towhee (*Melozone crissalis*), and song sparrow (*Melospiza melodia*). Many birds associated with riparian woodlands nest or roost in riparian trees and feed in adjacent habitat areas, such as annual grasslands. Steller's jay (*Cyanocitta stelleri*) and western scrub jay are found in abundance in the riparian woodlands outside the Academic Growth Boundary at Stanford, as are California thrasher, red-tailed hawk, Cooper's hawk, red-shouldered hawk, and sharp-shinned hawk (*Accipiter striatus*). Riparian woodlands also provide important feeding, resting and nesting for neotropical songbirds such as warblers, vireos, grosbeaks and flycatchers.

Common mammals found within these riparian woodlands include: black-tailed deer, opossum, raccoon, deer mice, Botta's pocket gopher, tree squirrels (*Scirus* species), San Francisco dusky-footed wood rat, California vole, coyote, gray fox, bobcat, striped skunk, and the nonnative red fox (*Vulpes vulpes*). A number of bat species have been recorded in riparian woodland at Stanford, including: Townsend's big-eared bat, red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), Yuma myotis (*Myotis yumanensis*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), big brown bat (*Eptesicus fuscus*), and western pipistrelle (*Pipistrellus hesperus*) (Stanford 2017).

Amphibians and reptiles known to occur in this biotic community include western toad, Sierran treefrog, CRLF, arboreal salamander, black salamander (*Aneides flavipunctatus*), slender salamander (*Batrachoseps attenuates*), California newt (*Taricha torosa*), rough-skinned newt (*T. granulosa*), Santa Cruz ensatina (*Ensatina eschscholtzi*), California kingsnake (*L. getula californiae*), gopher snake, western night snake (*Hypsiglena torquata*), western fence lizard, alligator lizard (*Elgaria species*), and western skink Western pond turtles (*Actinemys marmorata*) are found in Felt Reservoir and in the San Francisquito Creek system.

Native fish recorded from the Matadero and San Francisquito systems include three-spined stickleback (*Gasterosteus aculeatus*), roach (*L. symmetricus*), Sacramento sucker (*Catostomus occidentalis*), and sculpin (*Cottus asper* and *C. gulosus*). Steelhead/rainbow trout (*Oncorhynchus mykiss*) are found locally in the San Francisquito system, but have not been recorded in the Matadero system in recent surveys conducted by Stanford. Hitch (*Lavinia exilicauda*) and Sacramento blackfish (*Orthodon microlepidotus)* have historically been present in the San Francisquito Creek system.

Steelhead spawn throughout the San Francisquito Creek system, including those portions of the creek that extend along the west edge of the Project site (see additional discussion of steelhead under Special status Species on the Project Site, below). Native mussels (*Anodonta* species) are also found scattered throughout the San Francisquito Creek system.

Nonnative aquatic animals that have been recorded from the creeks outside the Academic Growth Boundary at Stanford include bullfrog (*Lithobates catesbeianus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), red-ear sunfish (*Lepomis microlophus*), mosquito fish (*Gambusia affinis*), largemouth bass (*Micropterus salmoides*), Louisiana red swamp crayfish (*Procambarus clarki*) and signal crayfish (*Pacifastacus leniusculus*). Bullfrogs are occasionally observed in the Stanford portions of Matadero Creek and Deer Creek; generally, no more than three

or four individuals are observed each year (and fewer than 10 bullfrog tadpoles have been encountered in Matadero and Deer creeks since the mid-1990s). Green sunfish are present but uncommon in the unincorporated Santa Clara County portion of Matadero Creek, and are limited in Deer Creek to reaches immediately upstream from its confluence with Matadero Creek (reaches that do not typically dry out). No young-of-the-year green sunfish have been observed in the Stanford portions of Matadero Creek and Deer Creek during annual surveys since 1997, suggesting that juvenile or adult sunfish may be dispersing into either downstream or upstream reaches. During recent annual surveys, only one largemouth bass and one sunfish were observed in the Stanford portion of the Matadero watershed; Louisiana red swamp crayfish are found in Matadero Creek.

Mitten crabs (*Eriocheir sinensis*) have been observed in the San Francisquito Creek watershed. In 1999 and 2000, hundreds of crabs were seen in San Francisquito Creek, upstream as far as the confluence of Corte Madera and Bear creeks. During 2001 through 2015, few crabs were observed in the system (and none during the last few years). In 2000, a mitten crab was observed in Matadero Creek, just downstream of the Foothill Expressway bridge. Mitten crabs have not been observed in the areas of the creek that support CRLF, but they could colonize the area in the future. At the present time, the extent and impacts of this recent invasion are unclear.

Chaparral and Scrub

Chaparral and scrub are present on the Project site outside the Academic Growth Boundary at Stanford in several locations including the Dish area and small peripheral areas off Alpine Road. This chaparral includes dense stands of chamise (*Adenostoma fasciculatum*), California sagebrush (*Artemisia californica*), coyote brush, buckbrush (*Ceanothus cuneatus*), yerba-santa (*Eriodictyon californicum*), toyon (*H. arbutifolia*), scrub oak (*Quercus berberidifolia*), poison oak, black sage (*Salvia mellifera*), sticky monkey flower (*Mimulus aurantiacus*), and California bee plant (*Scrophularia californica*).

Chaparral and scrub provide habitat for a diversity of terrestrial wildlife. Amphibians include western toad and Sierran treefrog. Reptiles include western fence lizard, gopher snake, western racer, and northern Pacific rattlesnake (*Crotalus oreganus oreganus*). Mammals and birds found in the chaparral and scrub are primarily the same species found in annual grasslands and oak woodlands of the area.

Seasonal Wetlands

The seasonal wetlands on the Project site outside the Academic Growth Boundary at Stanford include several constructed ephemeral ponds and some small semi-natural seasonal pools scattered across the lower foothills. Rainfall permitting, all of these bodies of water support large numbers of aquatic invertebrates and vegetation.

Perennial Standing Water

Felt Reservoir supports populations of fishes, most of which are nonnative game species such as largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus),* sunfish (*Lepomis* species) and catfish (*Ameiurus* species*)*. Felt Reservoir does not provide high-quality

habitat for native aquatic species of conservation concern due to the presence of bullfrogs, the abundance of nonnative fishes, the highly variable water level, and the lack of cover-providing emergent vegetation. However, western toads reproduce in Felt Reservoir and the reservoir provides habitat for waterfowl and foraging areas for bats. In 2015 and 2016, two bald eagles (*Haliaeetus leucocephalus*) were frequently observed foraging at Felt Reservoir, presumably nesting in the vicinity; they successfully fledged two young in 2016. Felt Reservoir is used by both migratory and resident birds. Freshwater mussels (likely *Anodonta californiensis* and/or *A. oregonensis*) were present in Felt Reservoir, but have not been documented in the reservoir since the renovation work of 2008. Nonnative Chinese mystery snails (*Cipangopaludina chinensis*) and Louisiana red swamp crayfish (*Procambarus clarkii*) are abundant. Western pond turtles (*Actinemys marmorata*) and nonnative red-eared sliders (*Trachemys scripta elegans*) are also present in Felt Reservoir.

Developed Facilities

The Stanford Golf Course, located outside of the Academic Growth Boundary, contains Riparian Woodland and Creeks (described above), as well as a heavily managed landscape environment potentially used by some native species. The golf course maintains putting and driving greens interspersed with high grass in the "rough." The golf course manages the landscape through irrigation, mowing, tree trimming and removal, and rodent trapping. High amounts of human use coupled with active landscape management make the golf course unsuitable for many native plants, vertebrates and invertebrates. However, the golf course is used by a number of native bird species, small mammals, amphibians and native plants. Some native and nonnative species may thrive at the golf course because of the artificially high levels of moisture caused by irrigation, and the relative absence of predators.

The presence of special status species within the golf course is highly dependent on the specific microhabitat. The creek and riparian areas located within the golf course support steelhead, dusky-footed woodrat (*N. fuscipes*) and Cooper's hawk (*A. cooperii*). Western pond turtle (*A. marmorata*) has historically been found upstream of the golf course on San Francisquito Creek and therefore may be present.

On the Project site outside the Academic Growth Boundary, there are a number of additional existing facilities associated with civil infrastructure, research, education and agricultural leaseholds, including water reservoirs, solar observatories, caretakers' residences, etc. The vegetation immediately surrounding the facilities consists of managed, mostly nonnative vegetation. Isolated facilities and associated grounds may be occupied by California ground squirrels, deer mice and birds. Chemical rat poisons and traps are used for rodent control around these facilities.

Biological Communities Within the Academic Growth Boundary

All areas of the Project site within the Academic Growth Boundary are highly altered with biological conditions that reflect a long history of intensive use. This landscape contains extensive infrastructure and small remnant patches of natural habitat. Within the Academic Growth Boundary, fragmented patches of native vegetation and isolated wetlands provide habitat for native species. Remnant habitat patches can resemble the biological communities found in undeveloped lands on the Project site outside the Academic Growth Boundary. However, these

remnant patches tend to be of lower ecological value because they are small and are isolated from more extensive and biologically intact semi-natural areas.

As illustrated in Figure 5.3-1, biological resource areas on the Project site within the Academic Growth Boundary are divided into four distinct geographic sub-areas: the Lathrop Development District; Lagunita and its adjacent uplands; the Arboretum; and Central Campus. All of the Arboretum and most of Lagunita and its associated uplands are designated Campus Open Space in the Stanford Community Plan. Isolated wetlands can occur throughout this region.

With the exception of parts of the Lathrop Development District, which contains an oak woodland/savannah community, oaks growing elsewhere in the urban/suburban matrix within the Academic Growth Boundary are managed to meet the demands of civil infrastructure, aesthetics and public safety, and are considered as individual components of an urban forest.

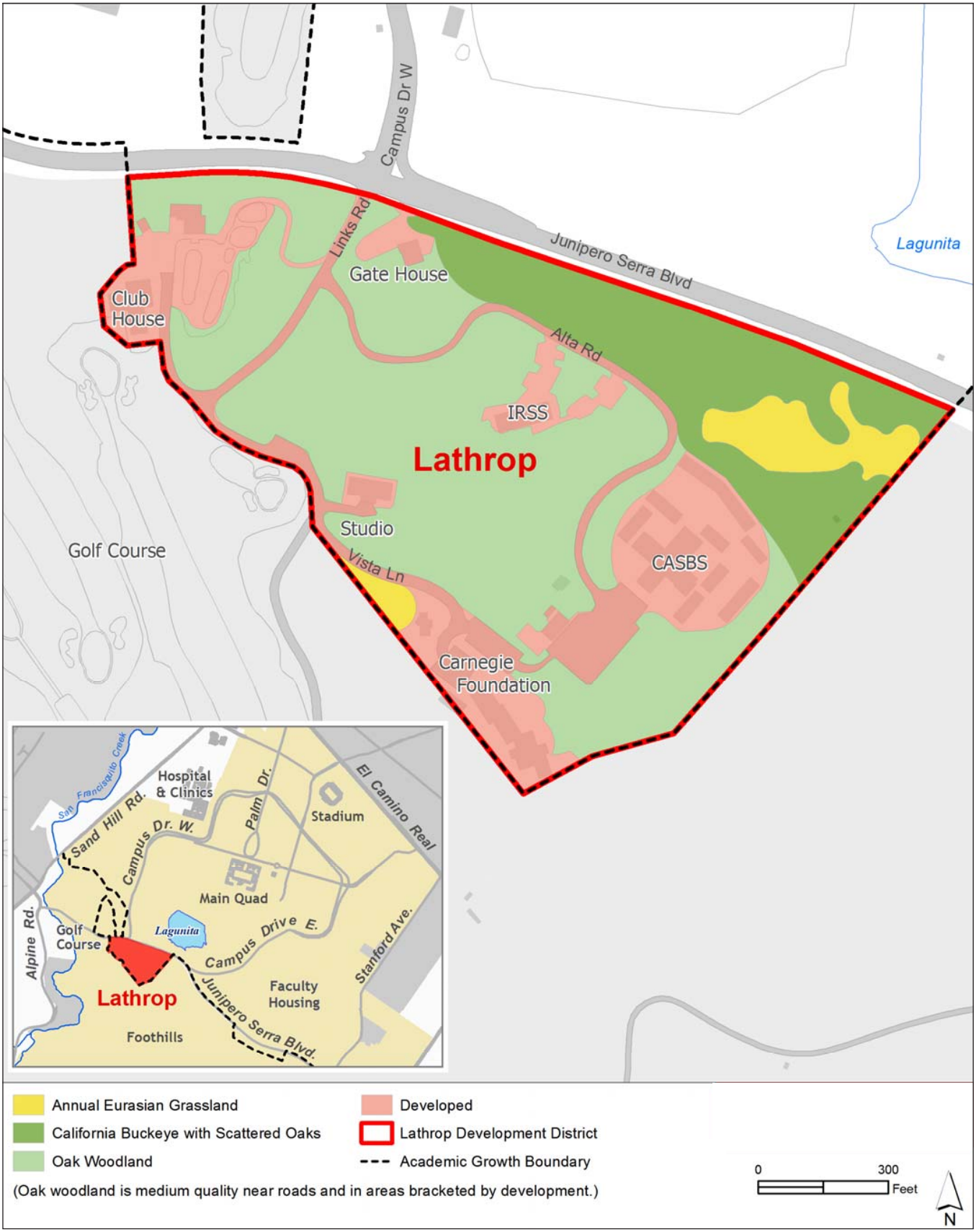
Lathrop Development District

The Lathrop Development District contains both built and natural elements, and includes an oak woodland/savannah community (same community type as described under Biological Communities Outside the Academic Growth Boundary, above) with an abundance of native plant species (see **Figure 5.3-2**, Oak Woodlands in the Lathrop Development District). This oak woodland/savannah community supports CTS and other native amphibian species. A number of native bird species, including migratory song birds and raptors, forage and nest in this development district.

The oak woodland/savannah community within the Lathrop Development District, similar to the oak woodland/savannah community located on the Project site outside the Academic Growth Boundary, is dominated by a mix of coast live oaks, blue oaks, valley oaks, and California buckeye. Within the Lathrop Development District the plant life and associated wildlife, including but not limited to, bird, bat, amphibian and reptile species, present in the oak woodland/savannah community are similar to that described for oak woodland/savannah community outside the Academic Growth Boundary on the Project site (see discussion of those species, above).

Lagunita and Adjacent Uplands

The wetlands at Lagunita are biologically important and support a wide range of native and non-native plant and animal species. These ephemeral wetlands support two species covered under the Stanford Habitat Conservation Plan (HCP): CTS and a population of an intergrade, or intermediate, form of the common gartersnake (*Thamnophis sirtali*s) (see Regulatory Setting, below, for discussion of Stanford HCP). Plant species are abundant in the Lagunita wetlands and include a mix of native and non-native species, including: northern water plantain (*Alisma triviale*), narrowleaf milkweed (*Asclepias fascicularis*), hen-fat (*Atriplex prostrata*), pale spikerush (*Eleocharis macrostachya*), fringed willowherb (*Epilobium ciliatum*), toad rush (*Juncus bufonius*), California grey rush (*Juncus patens*), alkali mallow (*Malvella leprosa*), longroot smartweed (*Persicaria amphibia*), Harding grass (*Phalaris aquatica*), common knotgrass (*Polygonum aviculare*), annual beard-grass (*Polypogon monspeliensis*), Himalayan blackberry (*Rubus armeniacus*), and common cocklebur (*Xanthium strumarium*).



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LRBE LUEP, 2017

Figure 5.3-2
Oak Woodlands in the Lathrop Development District

Several amphibian species commonly reproduce in Lagunita, including CTS, western toad, and Sierran treefrog. Reptiles commonly found in the reservoir include Pacific gopher snake, western racer, western fence lizard, and southern alligator lizard. The intergrade gartersnake is rarely observed in Lagunita.

Few bird species nest within the seasonal wetland, but many species forage at the site. Species which regularly nest there include: killdeer (*Charadrius vociferous*), red-winged blackbirds, American coots (*Fulica americana*), and mallard ducks (*Anas platyrhynchos*). Bird species that forage at Lagunita when water is available include virtually all the species regularly found at Stanford. Other common wildlife in the reservoir proper include California vole, Botta's pocket gopher, mice, and black-tailed jackrabbit.

The upland areas adjacent to Lagunita include California ground squirrel, jackrabbit, and San Francisco dusky-footed woodrat. Coyote and black-tailed deer are also occasionally found in these upland areas. Native amphibians and reptiles found in these uplands, include: western toad, Sierra treefrog, western racer and Pacific gopher snake.

Plant species found in these uplands include a large mix of native and non-native shrubs, trees, and annual and perennial grassland species. A partial list of the plant species found in this area includes acacia (*Acacia* species), buckeye, fiddleneck (*Amsinckia menziesii*), burr chervil (*Anthriscus caucalis*), slender wild oat, common wild oat, Coyote bush, California brome (*Bromus carinatus*), ripgut brome, soft cheat (*Bromus hordeaceus*), compact brome (*Bromus madritensis*), Italian thistle, valley tassels (*Castilleja attenuata*), owl's clover (*Castilleja densiflora*), purple star-thistle, bindweed (*Convolvulus arvensis*), beaked hawks-beard (*Crepis vesicaria*), teasel (*Dipsacus sativus*), blue wild rye (*Elymus glaucus*), creeping wild rye (*Elymus triticoides*), redstem filaree (*Erodium cicutarium*), Italian ryegrass, bristly oxtongue, toyon, shortpod mustard (*Hirschfeldia incana*), wild barley (*Hordeum marinum*), smooth cat's ear (*Hypochaeris glabra*), birdsfoot trefoil (*Lotus corniculatus*), scarlet pimpernel (*Lysimachia arvensis*), hyssop loosestrife (*Lythrum hyssopifolia*), man-root (*Marah fabacea*), olive (*Olea europaea*), frogfruit (*Phyla nodiflora*), live oak, blue oak, valley oak, wild radish (*Raphanus sativus*), dock (*Rumex pulcher and R. salicifolius*), milk thistle, purple needlegrass, poison oak, California bay, and periwinkle (*Vinca major*).

Lagunita and its adjacent uplands are abutted by developed areas of the Project site, including student residences, the Stanford golf driving range and Junipero Serra Boulevard. The developed landscape is capable of supporting and sustaining some native biodiversity. However, the proximity of the developed environment limits the survival and persistence of native biodiversity.

Arboretum

The Arboretum is embedded within an urban matrix and used for recreation and overflow parking. Stanford regularly trims the trees in the Arboretum to maintain line of sight for public safety, and mows and disks the area for fire safety. Eucalyptus trees and oaks dominate the overstory plant assemblage in the Arboretum while the understory plants are mostly nonnative annual Eurasian grasses. The Arboretum also hosts the Arizona Garden which includes selections from the cacti family (*Cactacace*) including columnar, barrel and monstrose forms; and

succulents, including aloes (*Aloaceae*), crassulas (*Crassulaceae*) and rosette-forming agaves (*Agavaecae*). The Arboretum has been a managed landscape for more than 100 years and does not contain natural plant communities.

Wildlife, including black-tailed jackrabbit, striped skunk, raccoon, western fence lizard, and raptors, may be found within the Arboretum. However, successful reproduction by amphibians, birds, reptiles and small mammals is limited in this area due to the ongoing active maintenance of the area, the high abundance of mesopredators (raccoons, skunks and opossums), and human disturbance. Tree-nesting birds, however, frequently nest in the Arboretum.

Central Campus

The lands within the Academic Growth Boundary include both native and nonnative vegetation. Vegetation consists of remnant stands of native species, such as oaks, as well as nonnative trees (primarily eucalyptus), annual grasslands and ornamental landscape plants. In this area, many species native to the region have been planted as ornamental and drought-resistant, landscaping. The Central Campus is a highly modified and management landscape. This area provides limited value to wildlife, predominately nest locations for birds and roosts for bats; and does not contain natural plant communities. In general, the extensively built Central Campus is an inhospitable landscape for wildlife and native plants.

Native and introduced animals that are tolerant of human activities can thrive in urban landscapes. These species include: western fence lizard, southern alligator lizard, northern mockingbird, barn swallow, raccoon, striped skunk, European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), eastern gray squirrel (*S. caralinensis*), fox squirrel (*S. niger*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), and opossum.

Jurisdictional Waters and Wetlands

Nearly all of the area within the Academic Growth Boundary of the Project site has been assessed for the presence of jurisdictional waters and wetlands. The latest delineations indicate 36.6 acres of jurisdictional wetlands, 8.19 acres of jurisdictional waters and 0.78 acre of isolated wetlands within the Academic Growth Boundary. Of the 36.6 acres of jurisdictional wetlands, 34.75 acres are in Lagunita. Another 0.88 acre of jurisdictional wetlands is located within an area designated as Campus Open Space in the Stanford Community Plan.

Jurisdictional waters and wetlands within the Academic Growth Boundary are used by water birds, wildlife seeking water sources, aquatic invertebrates, and native wetland plants. The only special status species located within the jurisdictional waters and wetlands within the Academic Growth Boundary are found within the Lagunita basin.

Special Status Species on the Project Site

Of the special status species identified through the California Natural Diversity Database (CNDDB, 2017) and from Stanford records (see Appendix BIO, sub-Appendix A), CTS and the

San Francisco dusky-footed woodrat are present within the Academic Growth Boundary of the Project Site. No special status fish populations occur within the Academic Growth Boundary of the Project site.

Amphibians

The conservation and management of California red-legged frog and CTS populations at Stanford is directed through the Stanford HCP. Through the HCP, Stanford has federal and state incidental take authorization for impacts to these species from existing and future campus development, operations and maintenance.

Dispersal of CTS from Lagunita downslope to the developed campus lands is observed on rare occasion, but successful return to Lagunita is difficult due to the high density of buildings, roads, drains, curbs, retaining walls and stairs which present one-way barriers to salamander dispersal. The developed campus lands have long been considered a population sink[2] for CTS. For this reason, the Stanford HCP focuses conservation efforts on Lagunita and the lands outside the Academic Growth Boundary of the Project site, where CTS maintain a stable population (see Regulatory Setting, below, for additional discussion of Stanford HCP).

Margins of the Stanford Golf Course, mainly the rough closest to the constructed ponds in the foothills and Lagunita, may occasionally support CTS. The rough areas located in the interior of the golf course are partially isolated from other, more natural areas by heavily managed areas of turf and often are internally fragmented by cart paths and utilities.

While there are historic records of CRLF in Lagunita, there are no records of any sightings in the reservoir since 1956 despite intensive annual surveys of CTS beginning in the early 1990s. CRLF have potential to occur but are not presently known to occur within the Academic Growth Boundary.

Birds

Many species of raptors are frequently observed at the Project site, including within the Academic Growth Boundary. Peregrine falcons (*Falco peregrinus*) have been observed, but never documented to nest within the Academic Growth Boundary. Western burrowing owl, bald eagle, northern harrier (*Circus cyaneus*) and golden eagle have been observed regularly outside of the Academic Growth Boundary, and occasionally fly over the lands within the Academic Growth Boundary, but nesting of these species has never been observed within the Academic Growth Boundary. Many of the more regionally common species of raptors, including red-tailed hawk, red-shouldered hawk, Cooper's hawk, sharp-shinned hawk, American kestrel, barn owl, and great horned owl are known to frequently nest within and outside the Academic Growth Boundary of the Project site.

In addition to the above-mentioned raptors, many other common bird species that are covered by the federal Migratory Bird Treaty Act nest at Stanford, including on lands within the Academic

[2] A population sink is an area where a population's death rate exceeds its birth rate.

Growth Boundary (see Regulatory Setting, below, for additional discussion of Migratory Bird Treaty Act).

Mammals

The bats historically documented at the Project site include California bat, western small-footed bat (*Myotis ciliolabrum*), Yuma bat, little brown bat (*Myotis lucifugus*), long-legged bat, fringed bat, long-eared bat, silver-haired bat (*Lasionycteris noctivagans*), western pipistrelle, desert red bat, hoary bat, Townsend's long-eared bat, pallid bat, Mexican free-tailed bat (*Tadarida brasiliensis*), western mastiff bat (*Eumops perotis*), and big free-tailed bat (*Nyctinomops macrotis*). However, roosting and breeding records for these species are sparse and the historical records may represent non-resident bats. Historically pallid bats (*Antrozous pallidus*) had a maternal site within the Academic Growth Boundary, but this roost has been inactive for many years.

The San Francisco dusky-footed woodrat occurs within the Academic Growth Boundary, primarily in the Lathrop Development District and at Lagunita and adjacent uplands. San Francisco dusky-footed woodrats are abundant in many areas on the Project site outside of the Academic Growth Boundary.

Fish

Steelhead/rainbow trout are found in the San Francisquito Creek system, including in those portions that flow through Stanford. San Francisquito Creek contains one of the few remaining steelhead spawning runs in the San Francisco Bay drainage. The number of steelhead present in the watershed ranges from essentially zero in drought years to several hundred adult fish during wet years. At Stanford, relatively large numbers of young trout are typically found in Los Trancos Creek and in a few portions of San Francisquito Creek. This creek system is located outside the Academic Growth Boundary.

Special Status Plants

For most areas within the Academic Growth Boundary, the types and abundance of native plant species has been manipulated through a combination of agricultural use, seeding of "wildflower" mixes, landscape planting, disking, mowing, fertilization, irrigation, and soil compaction. Decades of research on plants, often occurring in "experimental" areas adjacent to academic buildings, has also resulted in the unintentional release of numerous species of native and non-native plants. Surveys completed at the County's direction between 2001 and 2017 yielded no observations of special-status plants. Thus, it is considered unlikely that native special-status plants are present in most areas of the main campus. Special-status plants may occur in natural communities outside the Academic Growth Boundary (see Appendix BIO, sub-Appendix A).

Based on 16 years of plant surveys, most of the areas within the Academic Growth Boundary are considered to have low potential to support naturally occurring special-status plant species. The only areas with a reasonable potential to host special-status plant species are jurisdictional wetlands and waterways, Lagunita and associated uplands, and the oak woodland/savannah community within the Lathrop Development District.

5.3.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Most of the remaining unbuilt development authorized under the 2000 General Use Permit will be constructed or will be under construction within the Academic Growth Boundary prior to commencement of the proposed 2018 General Use Permit. In addition, Stanford is currently conducting turf replacement and irrigation improvements at Stanford Golf Course, which has limited habitat value for biological resources. As applicable, these developments have completed or are pending approval from the County through its Architecture and Site Approval (ASA) process. In all cases, the County considered and addressed potential biological effects, as needed for those developments through the ASA process. Section 5.0 notes nearby development outside the Project site boundary in adjacent jurisdictions that is occurring. There are no substantive changes anticipated between the existing environmental setting described above and the 2018 baseline environmental setting as it relates to biological resources. Therefore, the conditions described above for the existing environmental setting are also representative of the 2018 environmental baseline.

5.3.4 Regulatory Setting

Federal

Federal Endangered Species Act

The United States Fish & Wildlife Service (USFWS), which has jurisdiction over plants, wildlife, and most freshwater fish, and the National Marine Fisheries Service (NMFS), which has jurisdiction over anadromous fish, marine fish, and marine mammals, oversee implementation of the Federal Endangered Species Act (FESA). The FESA includes protections for species that are formally listed by the USFWS or NMFS (as applicable) as either "endangered" or "threatened." An "endangered" species is an animal or plant species that has been determined to be in danger of extinction throughout all or a significant portion of its range. A "threatened" species is an animal or plant species that has been determined as likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

The method of implementation of the FESA depends on whether a federal agency action is involved, such as issuance of a federal permit or federal funding to a non-federal entity (i.e., State or local government, or a private party).

Section 9 of the FESA prohibits the "take" of any listed animal species. The federal definition of "take" includes actions that unintentionally "harass" or "harm" a listed animal species. "Harass" is defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. "Harm" is defined as an act which actually kills or injures wildlife, which may include significant

habitat modification or degradation where it kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

The "take" prohibition applies only to listed animal species, and not to listed plants. For plants, Section 9 of the FESA prohibits the removal, possession, damage or destruction of any endangered plant from federal land, as well as acts to remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass.

Federal Agency Action – Section 7 Consultation

If a federal agency action (including issuance of a permit or provision of funding to a non-federal entity) "may affect" a listed species or its "critical habitat" (defined below), the federal agency must engage in a consultation process with the USFWS and/or NMFS (as applicable). This consultation process, which applies to both listed animal and plant species, is designed to ensure that the federal agency action does not jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat.

"Critical habitat" is defined as the specific areas that are essential to the conservation of a federally listed species, and that may require special management consideration or protection. Critical habitat is determined using the best available scientific information about the physical and biological needs of the species. These needs, which are referred to as "primary constituent elements," include: space for individual and population growth and for normal behavior; food, water, light, air, minerals, or other nutritional or physiological needs; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitat that is protected from disturbance or is representative of the historical geographic and ecological distribution of a species.

The designation of critical habitat by the USFWS and NMFS has often lagged behind the listing of species as threatened or endangered under the FESA. As a result, for various listed species, there is no designated critical habitat.

No Federal Agency Action – Section 10 Habitat Conservation Plan & Incidental Take Permit

When there is no federal agency action that triggers the FESA Section 7 consultation process as described above, but where a public or private action would result in the unintentional "take" of a listed animal species, for example as a result of the impacts of a development project, FESA Section 10 requires the issuance of an "incidental take" permit. This permit requires the preparation and implementation of a "habitat conservation plan," which is referred to as an "HCP." An HCP outlines conservation measures to minimize the impacts to listed species, including measures to maintain, enhance and protect the species' habitat.

Federal Migratory Bird Treaty Act (MBTA)

The federal MBTA (16 U.S.C. Sections 703-712) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Clean Water Act (CWA) Section 401

Under CWA Section 401, applicants for a federal license or permit planning to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or from the interstate water pollution control agency with jurisdiction over affected water. The San Francisco Regional Water Quality Control Board would administer this certification. All projects that have a federal component and that may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.

Clean Water Act (CWA) Section 404

Under Section 404 of the federal CWA, a permit from the U.S. Army Corps of Engineers (Corps) is required for the discharge of dredged or fill material into "waters of the United States.", "Traditional Navigable Waters" are waters that are currently used, were used in the past, or may be susceptible to use in interstate and foreign commerce, including waters subject to the ebb and flow of the tide. "Waters of the United States" also include water bodies such as wetlands and intermittent streams and creeks that have a "significant nexus" to Traditional Navigable Waters." The USEPA retains the authority under the CWA to veto Section 404 permits issued by the Corps. In implementing Section 404 with respect to the fill of wetlands, the federal government supports a policy of minimizing "the destruction, loss or degradation of wetlands" under Executive Order 11990 (May 24, 1977).

Rivers and Harbors Act

In addition to permits required for dredge and fill projects under Section 404, a Corps permit is required under Section 10 of the Rivers & Harbors Act of 1899 (33 U.S.C. Section 403) for work or structures in or affecting navigable waters.

State

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of plant and animal species designated as either threatened or endangered in the State of California. Under the California Endangered Species Act (Fish and Game Code Sections 2050 et seq.), a permit is required from the California Department of Fish & Wildlife (CDFW) for the incidental "take" of a state-listed species.

There are several differences between the FESA and the CESA, as noted below:

- The state list of protected species is different than the federal list, although there are a number of species that are listed at both the state and federal level;
- The definition of "take" under the CESA is narrower than the federal definition under the FESA. In particular, Fish & Game Code Section 86 defines take to mean to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Unlike

the federal definition, the state law definition does not include "harming" or "harassing" a listed species, such as by way of habitat modification;

- Whereas the federal "take" prohibition does not apply to "candidate" species that are being considered for future federal listing, the state prohibition applies to "candidate" species being considered for listing under the CESA, unless the CDFW provides otherwise;

- Federal "take" provisions make a significant distinction between listed animal and plant species, but the state law "take" provisions apply equally to listed animal and plant species;

- The FESA authorizes the USFWS or NMFS (as applicable) to provide lesser protections for "threatened" species than for "endangered" species, and there is no such allowance for this distinction under the CESA; and

- There are no provisions in the CESA for the designation of "critical habitat."

California Environmental Quality Act (CEQA)

Under CEQA Guidelines Section 15065(a), a project has a significant impact on the environment where there is substantial evidence, in light of the whole record, that the project has the potential to "substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; [or] substantially reduce the number or restrict the range of an endangered, rare, or threatened species."

Under CEQA Guidelines Section 15380(b), a species is considered "endangered" for CEQA purposes if "its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors." A species is considered "rare" for CEQA purposes if it meets either of the following two criteria: (1) although not presently threatened with extinction, the species exists in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or (2) the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the FESA.

Species that are formally listed under the FESA are presumed the meet the definition of "endangered, rare, or threatened species." Similarly, species that are formally listed under CDFW regulations [see Title 14, Cal. Code Regs. (CCR), Sections 670.2 and 670.5] are presumed to meet this definition. In addition, a CEQA lead agency has discretion to determine that a species that is not formally listed meets this definition. The CDFW interprets Lists 1A, 1B, and 2 of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California to comprise plants that, in a majority of cases, would qualify as rare, threatened, or endangered.

California Oak Woodlands Conservation Act

California Senate Bill 1334, the Oak Woodlands Conservation Act, became law in 2001 and was added to CEQA as Public Resources Code (PRC) Section 21083.4. This law protects oak woodlands that are not protected under the Z'Berg-Nejedly Forest Practice Act PRC Sections 4511-

4628). The Oak Woodlands Conservation Act requires a county to determine whether or not a project would result in a significant impact on oak woodlands. If the project would result in a significant impact on oak woodlands, then the county must implement mitigation measures as prescribed under the PRC to reduce or compensate for the loss of oak woodlands.

California Fish and Game Code Requirements

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed the CDFW to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The CESA expanded upon the original NPPA and enhanced legal protection for plants. The CESA established threatened and endangered species categories, and grandfathered all rare animals—but not rare plants—into the CESA as threatened species. Thus, there are three official listing categories for plants in California: rare, threatened, and endangered.

Nesting Birds

Under Fish & Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. In turn, § 3503.3 prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs.

Fully Protected Species

The California Fish and Game Code also allows the designation of a species as Fully Protected (see Section 3511 regarding birds, Section 4700 regarding mammals, Section 5050 regarding reptiles and amphibians, and Section 5515 regarding fish). This designation provides a greater level of protection than is afforded by the CESA, and until recently, fully protected species could not be taken at any time. On October 18, 2011, California Senate Bill 618 was signed into law, which permits take of fully protected species where a Natural Communities Conservation Plan has been approved and is being implemented to ensure protection of those species.

Sensitive Natural Communities

Sensitive natural communities are identified as such by the CDFW's Natural Heritage Division and include those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special status species: information is maintained on each site's location, extent, habitat quality, level of disturbance, and current protection measures. The CDFW is mandated to seek the long-term perpetuation of the areas in which these communities occur. While there is no statewide law that requires protection of all special-status natural communities, CEQA requires consideration of a project's potential impacts on biological resources of statewide or regional significance.

California Department of Fish and Wildlife

Under Fish and Game Code Sections 1600–1616, the CDFW regulates activities that would substantially divert, obstruct the natural flow of, or substantially change rivers, streams, and lakes. The jurisdictional limits of the CDFW are defined in Section 1602 as the "bed, channel, or bank of any river, stream, or lake." CDFW conditions activities regulated under these provisions through issuance of a Streambed Alteration Agreement.

San Francisco Bay Regional Water Quality Control Board (SFRWQCB)

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) regulate "waters of the state," which are broadly defined under the Porter-Cologne Water Quality Control Act (Water Code Sections 13000 et seq.) as "any surface water or groundwater, including saline waters, within the boundaries of the state." The SFRWQCB has jurisdiction over waters of the state in the Bay Area.

For discharges of dredged or fill material, when a permit is required from the Corps under Section 404 of the federal CWA, the SFRWQCB is responsible for issuing a Water Quality Certification under Section 401 of that act. This certification, which is a prerequisite for the Corps permit, is designed to ensure that the activity involving the discharge will comply with the applicable state water quality standards. When a permit is not required from the Corps – for example, if the discharge is to an isolated, intermittent or ephemeral water body that is not considered a "water of the U.S." – the SFRWQCB assumes primary permitting responsibility under State law through the issuance of "Waste Discharge Requirements" (WDRs). WDRs implement the relevant water quality control plans and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisances (Water Code Section 13263). In implementing these provisions, the SFRWQCB follows a policy of no net loss of wetlands and typically requires mitigation for impacts to wetlands before authorizing dredge and fill projects that discharge to wetlands.

In addition, California has been delegated the authority under Section 402 of the CWA to issue permits under the National Pollutant Discharge Elimination System (NPDES) permit program. This program governs wastewater discharges, including discharges of stormwater, to surface water bodies. The SFRWQCB oversees this permit program in the Bay Area.

County of Santa Clara

Santa Clara County Tree Preservation Ordinance

The County's tree preservation ordinance is codified in Division C16 of the County Code of Ordinances. Section C16-2 defines a "tree" as a woody plant having a single trunk measuring at least 37.7 inches in circumference (12 inches or more in diameter) or in the case of multi-trunk trees, a trunk size of 75.4 inches in circumference (24 inches in diameter). Section C16-3 defines a "protected tree" as a tree that meets certain requirements, including but not limited to, the following:

- Any "heritage tree, as that term is defined in Section C16-2." Section C16-2 defines "heritage tree" as follows: Heritage tree shall include any tree which, because of its history, girth, height, species or other unique quality, has been recommended for inclusion on the heritage resource inventory by the Historical Heritage Commission and found by the Board of Supervisors to have special significance to the community, and which has therefore been included in the heritage resource inventory adopted by resolution of the Board of Supervisors.

- Any "tree required to be planted as a replacement for an unlawfully removed tree, pursuant to Section C16-17(e) of this division."

- Any "tree that was required to be planted or retained by the conditions of approval for any use permit, building site approval, grading permit, architectural and site approval (ASA), design review, special permit or subdivision."

- "Any tree, regardless of size, within rights-of-way and easements of the County, whether within or without the unincorporated territory of the County.

Under Section C16-4 of the County's tree preservation ordinance, a permit for removal of a protected tree is not required "for the cutting, removal, destruction, or pruning of a tree" in circumstances the tree is diseased, dead, or dying, or substantially damaged from natural causes; is needed to remove a hazard to life and personal property; is necessary to carry out a building site approval or other land use application approved by the County; or for maintenance works within public utility easements.

Section C16-7 of the tree preservation ordinance specifies the requirements for an administrative permit to remove protected trees. Among other provisions, Section C16-7(e) specifies that ratio of trees removed to trees planted shall be determined by the Planning Department.

Santa Clara County Oak Woodlands Impact Guidelines

In accordance with the Oak Woodlands Conservation Act, the County of Santa Clara created the Santa Clara County Planning Office Guide to Evaluating Oak Woodlands Impacts (last updated July 28, 2011). According to the County's guidelines, oak woodlands include a woodland (grouping of trees) on a unit of land or project site where oak trees encompass 10 percent or greater of the canopy cover. The 10 percent canopy cover applies to the individual woodland and not the entire project site (which may contain one or more woodlands). Oak woodlands within Santa Clara County are identified in the County Planning Office's GIS map information using sources from Santa Clara Valley Habitat Conservation Plan data, and California Department of Forestry and Fire Protection's Fire and Resource Assessment Program data.

A land development project is considered to have a significant direct impact on oak woodlands if the project will result in a decrease of 0.5 acre or more of native oak canopy within oak woodland on the project site. If the project is within a mapped oak woodland area, and the project proposes oak tree removal, a tree removal plan and arborist report (if requested) must be submitted which identifies the species type, diameter, and amount of canopy of oak trees proposed for removal within the woodland. As discussed in the Environmental Setting, oak woodlands are present on the Project site outside the Academic Growth Boundary and within the Lathrop Development District.

Santa Clara County General Plan

The Santa Clara County General Plan includes policies that address resource conservation issues. Stanford Community Plan Policy RC-7, which addresses buffer zones along creeks (see Stanford Community Plan, below), contains a cross reference to Santa Clara County General Plan Policy R-RC 37, which states:

> ***Policy R-RC 37:*** Lands near creeks, streams, and freshwater marshes shall be considered to be in a protected buffer area, consisting of the following:
>
> (1) 150 feet from the top bank on both sides where the creek or stream is predominantly in its natural state;
>
> (2) 100 feet from the top bank on both sides of the waterway where the creek or stream has had major alterations; and
>
> (3) In the case that neither (1) nor (2) are applicable, an area sufficient to protect the stream environment from adverse impacts of adjacent development, including impacts upon habitat, from sedimentation, biochemical, thermal and aesthetic impacts.

Stanford Community Plan

The Stanford Community Plan is a component of the County of Santa Clara General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

Resource Conservation

Habitat and Biodiversity

The Resource Conservation Chapter of the Stanford Community Plan addresses habitat and biodiversity; strategies, policies and recommended implementation measures include:

> **Strategy #1:** Improve current knowledge and awareness of habitats and natural areas.
>
> ***Policy SCP-RC 1 –*** Maintain and update inventories and maps of important biological resources on Stanford lands, including protected species, species considered at risk of local extinction, and habitat types (biotic communities), for use in conservation efforts, land use decision making, and monitoring of resource status.
>
> ***Policy SCP-RC 2 –*** Allow field research and other academic activities related to improvement of knowledge and understanding of habitat resources to occur in areas south of Junipero Serra Boulevard.
>
> Implementation Recommendations:
>
> ***SCP-RC(i)1 –*** Require Stanford to prepare California Natural Diversity Database records for species of concern.
>
> ***SCP RC(i)2 –*** Transmit natural resource map updates to the County using the County's current electronic map format standards.

Strategy #2: Protect the biological integrity of habitat areas and adequately mitigate impacts.

Policy SCP-RC 3 – Assure the protection of habitats for special status species in approving the location and design of new development. Avoid habitat areas for these species in the location of development whenever feasible.

Policy SCP-RC 4 – Protect and maintain habitats, natural areas, and wildlife corridors in development and redevelopment.

Policy SCP-RC 5 – Protect habitat areas through use of the Open Space and Field Research, Special Conservation, and Campus Open Space land use designations, and through use of the Academic Growth Boundary. If land use designation changes or AGB relocation is proposed, conduct detailed studies for presence of special status species and their habitat prior to decision making.

Policy SCP-RC 6 – Require Stanford to mitigate any impacts on special status species or other biological resources that result from land development through:

a. Mitigation measures that have proven to be effective, which shall be implemented prior to commencement of site preparation and construction activities as appropriate.
b. Mitigation measures, such as provision of new habitat areas which shall be monitored and, if necessary, revised over time to ensure the viability of those measures as mitigation.

Policy SCP-RC 7 – Maintain and restore riparian buffer zones along creeks as described in Santa Clara County General Plan policy R-RC-37.

Policy SCP-RC 8 – Monitor and evaluate the recreational use of sensitive habitat areas and limit if necessary the recreational use of areas supporting significant, but less sensitive, natural resources.

Implementation Recommendations:

SCP-RC(i)3 – Establish guidelines for review and approval of research and teaching activities in habitat areas, particularly in those areas which support special status species.

SCP-RC (i)4 – Develop and implement a program for monitoring and managing recreational activities in the foothills with regard to the habitat impacts of these activities.

SCP-RC(i)5 – Participate in the preparation and implementation of a Habitat Conservation Plan for Stanford lands, if such effort is initiated by Stanford or the USFWS.

SCP-RC(i)6 – Require long-term habitat protection measures in appropriate locations as mitigation for development in habitat areas that support special status species or that are protected through local, state, or federal regulations.

SCP-RC(i)7 – Require replacement of trees greater than 12 inches in diameter which are removed at a 1:1 ratio of replacement to removed trees. For oaks, which meet this criteria, require relocation of trees or replacement at a 3:1 ratio.

SCP-RC(i)8 – Develop guidelines for the location, siting and review of proposed construction projects that minimize impacts to natural resources.

SCP-RC(i)9 – Identify opportunities to conserve water used for irrigation and other purposes in order to limit use of water from creeks.

Strategy #3: Encourage and promote habitat restoration.

Policy SCP-RC 9 – Establish priorities for the restoration or rehabilitation of sensitive habitat areas and include habitat restoration as a key component of conservation management and planning.

Policy SCP-RC 10 – Stanford shall continue and support efforts to enhance habitats and populations of protected native species, including, but not limited to:

a. reduction of non-native invasive species;

b. wetland creation efforts, particularly to increase breeding sites for California tiger salamander; and

c. the oak reforestation program in the foothills, the Arboretum, and in other natural areas.

Implementation Recommendations:

SCP-RC(i)10 – Coordinate wetland preservation for flood control purposes with habitat restoration efforts.

SCP-RC(i)11 – Encourage location of facilities and trails out of sensitive habitat areas and areas undergoing habitat restoration.

Special Conservation Areas (SCA)

As illustrated in **Figure 3-6** in Chapter 3, Project Description, the Stanford Community Plan includes SCA land use designation for areas with high environmental sensitivity or designated as natural hazard areas within the Project site outside the Academic Growth Boundary. SCAs are designated in areas of steep or unstable slopes, seismic or other geologic hazard zones, riparian areas extending 150 feet from the top of creek banks and sensitive habitat areas, particularly for special status species. This SCA designation prohibits physical development in these areas, other than that which supports conservation efforts, or maintenance of existing utilities and roads. SCP-LU(i)(7) of the Community Plan calls for enacting and applying appropriate zoning for the SCA designation.

The areas of the Project site designated SCA include 395 acres of land along Los Trancos Creek, areas within the Stanford foothills, and land along Matadero Creek and Deer Creek. In locations where the areas designated SCA overlap with areas included in the Stanford HCP, the HCP requirements apply. In SCAs where there is no overlap with the HCP, management is guided by the County-approved Special Conservation Area Plan (see discussion of Special Conservation Area Plan, below).

Open Space and Field Research

As shown in Figure 3-6, the Open Space and Field Research designation applies to all undeveloped lands of the Project site located outside the Academic Growth Boundary that are not designated SCA. Allowable uses within this designation include field study activities, utility infrastructure in keeping with natural appearance of the foothills, grazing and other agriculture uses; recreational activities consistent with protection of environmental resources, specialized facilities and installations that by their nature require a remote or natural setting, and environmental restoration.

Campus Open Space

As illustrated in Figure 3-6**,** the Campus Open Space designation includes open space areas within the Academic Growth Boundary, including along Palm Drive, the Oval, the Arboretum, and Lagunita. It also applies to designated parks within faculty and staff residential neighborhoods and to important and substantial resource conservation areas such as wetlands or habitat conservation areas within the central campus.

Stanford

Stanford University Habitat Conservation Plan (Stanford HCP)

The Stanford HCP covers 4,372 acres within unincorporated Santa Clara County, including most of the Project site, as well as adjacent Stanford-owned land in the City of Palo Alto. The Stanford HCP establishes a conservation strategy for 50 years, starting in 2013. It is a comprehensive conservation program that protects, restores and enhances habitat, monitors and reports on Covered Species, and minimizes impacts on the Covered Species and their habitats. The Stanford HCP also memorializes major commitments of land protection, personnel and resources dedicated to biological resource conservation.

Following the process outlined by Section 10 of the federal Endangered Species Act, the Stanford HCP outlines actions Stanford is required to take to minimize or mitigate the impact of its activities on federally protected species. In turn, USFWS has provided assurances to Stanford, and in August 2013 issued a long-term Incidental Take Permit (ITP) that authorizes "take" of protected species associated with otherwise lawful activities. These proscribed activities relate to academic uses, general campus management and maintenance, redevelopment, future development, and conservation programs.

The Stanford HCP includes the following strategies:

- Concentrate conservation efforts in high-priority areas,
- Establish long-term habitat protection,
- Protect and restore riparian areas,
- Enhance habitat areas, and
- Perform monitoring and adaptive management practices.

In August, 2013, the County of Santa Clara determined that the Stanford HCP provides at least as much habitat value and protection for the CTS as that provided by 2000 General Use Permit Conditions J.1 through J.8, and pursuant to Condition J.9 the County determined that the Stanford HCP supersedes Conditions J.1 through J.8.

In May, 2016, the CDFW issued a Consistency Determination, determining that the ITP issued by USFWS, including incorporated measures in the HCP, is consistent with the CESA and meets the requirements set forth in California Fish and Game Code section 2081 for authorizing take of CESA-listed species (i.e., CTS). As a result, implementation of the Stanford HCP satisfies the requirements of both the federal and State endangered species acts.

Covered Species

Three species receive specific coverage under the Stanford HCP and ITP. These are:

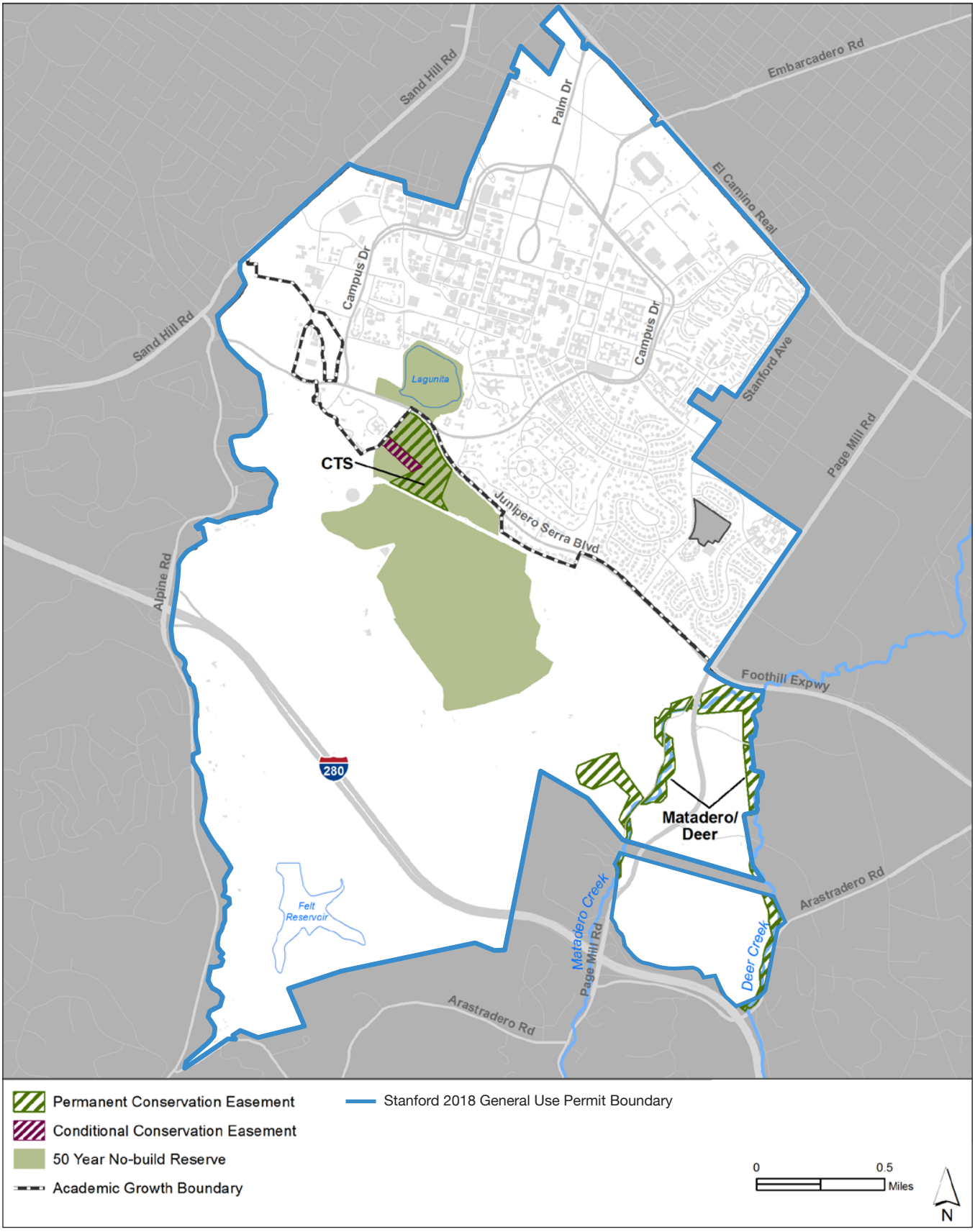
- CRLF,
- CTS, and
- San Francisco gartersnake (*Thamnophis sirtalis tetrataenia*).[3]

Management of the Covered Species includes population monitoring, habitat restoration and enhancement, educational programs for individuals whose work activities may impact the Covered Species, and minimization and mitigation of impacts caused by Stanford operations. The habitat requirements of the Covered Species overlap with the habitat requirements of many other native species. Therefore, conservation actions implemented at Stanford to protect the Covered Species also benefit many additional native species.

Permanent Conservation Easements

As illustrated in **Figure 5.3-3**, there are currently two permanent conservation easements resulting from implementation of the HCP: a 30-acre easement located in the lower foothills (primarily for the CTS), and the 90-acre Matadero/Deer Creek easement (primarily for the CRLF). CTS require seasonal ponds that fill in December or January and hold water until June, with sufficient levels of aquatic prey and cover to allow for larval development and metamorphosis; a lack of invasive predator species such as bullfrog; adjacent upland areas that provide sufficient densities of rodent burrows or debris for CTS to inhabit during the non-reproductive period; and vegetation appropriate for CTS residency and dispersal. Common gartersnakes are typically associated with permanent or nearly permanent bodies of water, usually with areas of shallow water and heavily vegetated shores; however, they are known to occur, at least temporarily, in grassland, riparian woodland, oak woodland and coniferous forest. CRLF require permanent bodies of slow-moving or standing water,

[3] The San Francisco gartersnake (*T.s. tetrataenia*) and red-sided gartersnake (*T.s. infernalis*) are two nominally distinct subspecies of the common gartersnake (*Thamnophis sirtalis*). The San Francisco garter snake is listed as endangered under the ESA. The red-sided garter snake is not a federally listed species. Both of these subspecies are found on the San Francisco Peninsula. Stanford is located within a well-documented intergrade, or intermediate, zone between these two subspecies; it is acknowledged in the HCP that the San Francisco form of the species is not currently recognized as being present at Stanford. The conservation program provided in the HCP supports the intergrade gartersnake that is present at Stanford.



SOURCE: Stanford LRBE LUEP, 2017

Stanford 2018 General Use Permit . 160531

Figure 5.3-3
Stanford Habitat Conservation Easements and No-Build Areas

with sufficient vegetation to provide cover and support ample prey, and with areas that are at least three feet in depth, along with adjacent upland areas of suitable vegetation to allow for dispersal and seasonal support of non-breeding individuals.

Conditionally Permanent Conservation Easement

As shown in Figure 5.3-3, a 4.5-acre conditionally permanent conservation easement, located in the lower foothills adjacent to the CTS easement discussed above, is the result of development of the Carnegie Foundation's campus in 2003. This easement will be in place as long as the Carnegie Foundation's buildings and amenities exist. If the buildings and supporting amenities are removed and the site restored to the preconstruction condition, the 4.5 acres would no longer be subject to use restrictions (aside from those enumerated in the HCP and Open Space/Field Research zoning).

Habitats Protected by a 50-year No-build Agreement

As shown in Figure 5.3-3, additional areas used by the Covered Species are protected in two 50-year no-build zones. The 40-acre Lagunita basin, which includes Lagunita and unbuilt surrounding upland, and a 315-acre CTS reserve in the lower foothills were designated to protect CTS and Stanford's intergrade population of gartersnakes. The Lagunita basin contains an ephemeral body of water (Lagunita, an artificially constructed and managed reservoir), aquatic prey and sufficient density of burrowing rodents. The 315-acre CTS reserve protects upland habitat composed of grassland, oak woodland/savannah, chaparral and scrub. Eight seasonal ponds constructed by Stanford in 2004 are also located in this no-build zone. The 30-acre permanent conservation easement targeting CTS conservation is a subset of the 315 acres within the CTS no-build reserve.

Management Zones

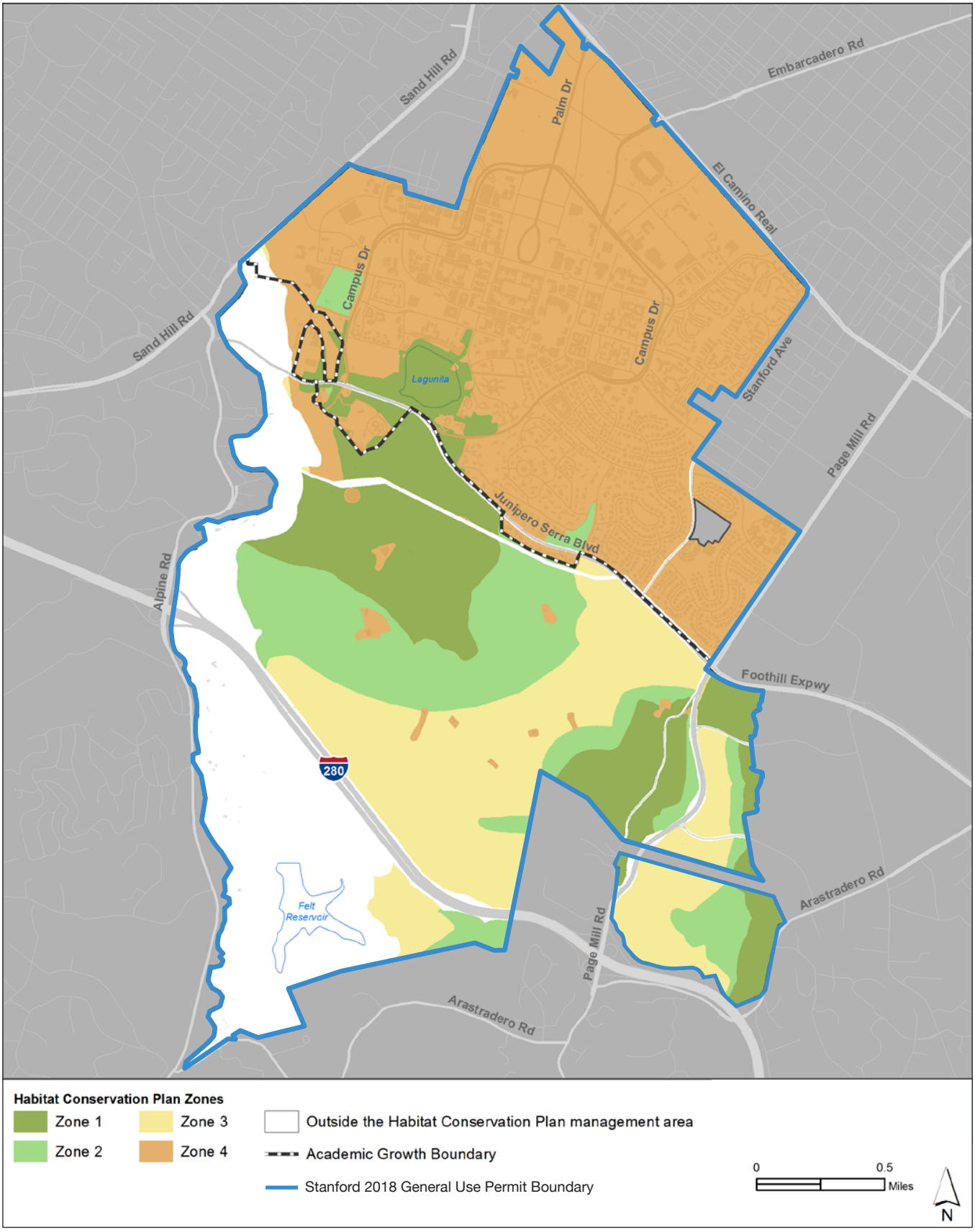
The HCP classifies the Project site into four management zones according to the habitat value of the land to the Covered Species. The four management zones and the quality of habitat they provide are discussed below and shown in **Figure 5.3-4**.

Zone 1

Areas classified as Zone 1 support one or more of the Covered Species or provide critical resources for a Covered Species. These areas are necessary for the local persistence of the Covered Species. A few areas that are currently degraded by the presence of a temporary land use also are included in Zone 1 if they are located in a place deemed critical for the long-term persistence of a Covered Species. Some areas in Zone 1 will be subject to extensive restoration and enhancement. There are approximately 623 acres in Zone 1.

Zone 2

Zone 2 areas are occasionally occupied by a Covered Species and provide some of the resources used by the Covered Species. These areas generally do not support individuals of the Covered Species on a year-round basis, but they provide indirect support to the Covered Species by providing a buffer between Zone 1 areas and areas that are impacted by urban and other uses. Zone 2 does not include any breeding habitat for the Covered Species. Under the HCP's



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LRBE LUEP, 2017

Figure 5.3-4
Stanford Habitat Conservation Plan Zones

Conservation Program, most of these areas will be maintained in a manner that will preserve their habitat values; some portions of Zone 2 may be enhanced to more directly support Covered Species. There are approximately 517 acres in Zone 2.

Zone 3

The lands in Zone 3 are generally undeveloped open space lands that have some biological value, but provide only limited and indirect benefit to the Covered Species. There are approximately 688 acres of land in Zone 3.

Zone 4

Zone 4 includes land that does not support or cannot sustain the Covered Species. This Zone includes urbanized areas that have been developed and those areas that are completely surrounded by urban development and/or roads, or are otherwise isolated from areas that support a Covered Species. Also designated as Zone 4 are generally small but highly developed facilities (such as the radio telescope - the Dish) which are located within areas that otherwise support Covered Species. There are approximately 2,544 acres of land in Zone 4.

Special Conservation Area Plan

Stanford's Special Conservation Area Plan was approved by the County in 2015. In areas where there is no overlap between the HCP and the areas designated SCA by the Stanford Community Plan, management is guided by the Special Conservation Area Plan, which states that the applicable minimization and management actions specified in the HCP apply.

In addition to the three species specifically covered by the Stanford HCP, steelhead (*Oncorhynchus mykiss*) is an additional protected species found on the Project site outside the Academic Growth Boundary (and not present in areas directly included in the HCP).[4] At Stanford, steelhead are found exclusively within the San Francisquito Creek watershed, within the Project site outside the Academic Growth Boundary.

The Special Conservation Area Plan contains several guidelines to protect this species and address the designated hazard areas in locations designated by the Plan, including but not limited to, prohibiting fishing, maintaining the riparian canopy, conducting site-specific geotechnical analyses within hazard areas prior to any construction work, and scheduling work outside the wet season to the extent feasible.

[4] All *O. mykiss* from within a zone of anadromy, an area where at least some of the individuals are migratory, are considered steelhead. At Stanford, all *O. mykiss* downstream of Searsville Dam, including Los Trancos and Bear creeks, are classified as steelhead. All *O. mykiss* upstream of Searsville Dam are considered rainbow trout, because they never migrate between freshwater and marine environments. It is likely that resident, non-migratory, rainbow trout are present in Los Trancos and San Francisquito creeks.

5.3.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The threshold for significance for special status plants would be any measurable decrease in special-status plant populations. For endangered or threatened status wildlife, including fully protected species, any loss of individual animals would be a significant impact. For habitat modification, a significant impact is any measurable alteration of the habitat that would result in a drop in the population of special status species-- such as changes in food supply, reduction in elements needed for breeding habitat, or changes that limit opportunities for cover and movement.

The threshold for significance for natural communities would be any reduction in the extent of the community compared with baseline, or a change that could threaten the long-term existence of the community itself. The threshold of significance for wetlands is no-net-loss of extent. The threshold of significance for local ordinances is violation of any such ordinances.

Approach to Analysis

The Biological Resources analysis follows the approach outlined in Chapter 5, Approach to Analysis. The analysis compared locations where the proposed 2018 General Use Permit would allow potential development activity to known habitat types and species' locational information,

in order to assess the potential for impacts from permitted activities on species persistence or activities (foraging, nesting, estivating, or movement) or impacts to their habitats.

Species' Potential to Occur

Plant and wildlife species occurring in the Project Area were determined from the Stanford Biological Resources technical report (see Appendix BIO) and ESA biologists' survey experience at Stanford. No field studies were conducted specifically for this EIR.

Special status species include those listed as threatened or endangered under the Federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA); animals listed as "fully protected" under the California Fish and Game Code; animals designated as "Species of Special Concern" by the California Department of Fish and Wildlife (CDFW); and plants listed as rare or endangered by California Native Plant Society (CNPS). A table of special status species with potential to occur on the Project site is included in Appendix BIO.

Types of Impacts

Direct impacts to natural communities include removal of these communities and replacement with other land uses. Direct impacts on plant and wildlife species are assumed from loss of habitat in these communities. Site excavation, grading, filling, infrastructure construction, or other changes to habitat can result in death or injury or disturbance to wildlife, to the extent that the species cannot continue inhabiting or foraging in the area. Direct impacts may be temporary, if they disturb a habitat that is subsequently restored or displace individuals of a given species that later return to the site.

Indirect impacts on species may occur when remaining fragments of undeveloped habitat are isolated from larger areas of contiguous habitat, and species can no longer subsist in these smaller fragments. Indirect impacts can also occur due to degraded water quality; changes in hydrology; noise or dust, disturbance from human activities and domestic animals; increased predation or competition; invasive species spread; and other factors.

Due to the nature of the proposed Project, the 2018 General Use Permit was determined to have no impact on significance criterion f), above:

> **Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other adopted local, regional, or state habitat conservation plan –** As discussed in the Regulatory Setting, above, Stanford's HCP establishes a conservation strategy for the Project site for 50 years, starting in 2013. The Stanford HCP authorizes "take" resulting from Stanford's activities related to academic uses, general campus management and maintenance, redevelopment, future development and conservation programs. The uses proposed under the 2018 General Use Permit are consistent with the uses addressed by the Stanford HCP. Similarly, the uses proposed under the 2018 General Use Permit would also be consistent with Stanford's Special Conservation Area Plan and the CDFW Consistency Determination. Thus, the proposed Project would have no conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impact Evaluation

Construction and Operational Impacts

Impact 5.3-1: Project activities could result in adverse effects on special-status and migratory birds. (*Potentially Significant*)

As discussed in the Environmental Setting, habitat for nesting birds is present throughout the Project site, both within and outside the Academic Growth Boundary. Raptors protected under the federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code could nest in oaks and other large trees, and on buildings in the planning area. Many species of raptors are frequently observed at Stanford. Many of the more regionally common species, including red-tailed hawk, red-shouldered hawk, Cooper's hawk, sharp-shinned hawk, American kestrel, barn owl, and great horned owl are known to nest on the Project site within the Academic Growth Boundary. Peregrine falcon, western burrowing owl, bald eagle, northern harrier, and golden eagle have been observed on the Project site inside and outside the Academic Growth Boundary. However, nesting of these species has never been observed on the Project site within the Academic Growth Boundary. In addition to raptors, many other bird species protected under the MBTA nest on the Project site, both inside and outside the Academic Growth Boundary.

During construction of individual projects under the proposed 2018 General Use Permit, tree and shrub pruning or removal, or grading could directly impact nesting birds by damaging or destroying nests, causing adults to abandon nests, or directly killing or injuring nesting birds. Additionally, construction activity, such as elevated sound levels and vibrations from heavy construction equipment, could cause adult birds to abandon nests, especially larger bird species or birds that are accustomed to relatively low ambient noise levels. Thus, construction activities associated with development under the 2018 General Use Permit could result in potentially significant impacts to special-status and migratory birds.

Indirect effects to birds during operation of development under the 2018 General Use Permit would be unlikely because it is reasonable to anticipate that birds nesting in or near existing campus buildings and facilities would be acclimated to the noise and activity associated with regular campus operations and events. Consequently, Project operational impacts on nesting birds would be less than significant.

The following mitigation measures would reduce impacts of Project construction on nesting birds, including raptors and other migratory bird species protected by the MBTA, to a level that is less than significant. If Mitigation Measure 5.3-1(a) is implemented, no further mitigation measures are required. In the event that Mitigation Measure 5.3-1(a) cannot feasibly be implemented, then implementation of Mitigation Measures 5.3-1(b) through (e) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 5.3-1(a):** *Avoid tree removal and commencement of outdoor construction activities during nesting season.* Tree removal or pruning associated with project construction and commencement of outdoor project construction activities shall be avoided from February 1 through August 31, the primary local bird nesting season, to the extent feasible. If no tree removal or pruning associated with project construction is

proposed during the nesting period and outdoor project construction activities will commence outside the nesting period, no surveys for active bird nests are required.

Or

Mitigation Measure 5.3-1(b): *Survey for active bird nests within 250 feet of construction sites.* If the County Planning Office determines that compliance with Mitigation Measure 5.3-1(a) is not feasible because the timing of a construction project necessitates construction-related tree removal/pruning during the nesting season and/or commencement of outdoor construction activities during the nesting season, within seven days prior to the proposed start of construction activities an independent, qualified biologist approved by the County shall conduct a nesting bird survey of all potential habitat at the construction site and within 250 feet of the perimeter of the construction site. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 5.3-1(c): *Minimize impacts to active bird nests.* If any active nests are detected during the pre-construction survey, an independent, qualified biologist approved by the County shall recommend a work-exclusion buffer zone that shall be designated around the active nest to allow for both the successful fledging of the birds and initiation of work on some portions of the project site. The work-exclusion zone(s) shall be reviewed and approved by the County Planning Office prior to commencement of construction. A qualified biologist shall monitor any occupied nest located within a protective buffer zone in order to determine if the designated buffer zone is effective and when the buffer zone is no longer needed. If the buffer zone is determined to be ineffective, its size shall be increased until it is effective, or work shall cease until the young have fledged and are independent of the nest.

Mitigation Measure 5.3-1(d): *Delay activity***.** If no sufficient work-exclusion zone(s) are possible, then there shall be a delay in the start of construction until the active nest is no longer occupied. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used.

Mitigation Measure 5.3-1(e): *Remove nest starts.* A qualified biologist can visit project sites at any time prior to tree removal or the initiation of outdoor construction work in order to find and remove nest starts which do not have eggs or nestlings present. This activity will minimize impacts to birds as they will generally move elsewhere and restart their nest building process.

Significance after Mitigation: Less than Significant.

Impact 5.3-2: Project activities could result in adverse effects on special-status bats. (*Potentially Significant*)

As discussed in the Environmental Setting, habitats within the Project site have the potential to support roosting special-status bat species, including western small-footed bat, Yuma bat, little brown bat, long-legged bat, fringed bat, long-eared bat, silver-haired bat, desert red bat, hoary bat, Townsend's long-eared bat, pallid bat, western mastiff bat, and big free-tailed bat.

During construction of individual projects under the proposed 2018 General Use Permit, activities such as building demolition, tree and shrub removal, grading, and new building construction could directly impact roosting special-status bats, and elevated sound levels from heavy construction equipment could cause adult bats to abandon maternity roosts. Project construction activities could result in potentially significant impacts to special-status bats.

Indirect effects to bats during operation of development under the 2018 General Use Permit would be unlikely because special-status bats roosting in or near existing campus buildings and facilities would be acclimated to light, noise and activity associated with campus operations and events. Consequently, Project operational impacts on special-status bats would be less than significant.

The following mitigation measures would reduce Project construction impacts on special-status bats to a level that is less than significant. If Mitigation Measure 5.3-2(a) is implemented, and no roosting bats are identified, no further mitigation measures are required. In the event that Mitigation Measure 5.3-2(a) identifies roosting bats, then implementation of Mitigation Measures 5.3-2(b), (c), and/or (d) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 5.3-2(a):** *Conduct pre-project survey.* Prior to project construction, an independent, qualified bat biologist approved by the County shall conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be demolished within the work area and within a 50-foot radius of the work area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. If no roosting bats are found, no further action is required. If a bat roost is found, Stanford shall implement the following measures to avoid impacts on roosting bats.
>
> **Mitigation Measure 5.3-2(b):** *Evict non-maternal roosts.* If a non-maternal roost of bats is found in a tree or structure to be removed or demolished as part of project construction, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Removal or demolition should occur no sooner than at least two nights after the initial minor site modification (to alter airflow). This action allows bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of disturbance. Departure of the bats from the construction area shall be confirmed with a follow-up survey by a qualified bat biologist prior to start of construction.
>
> **Mitigation Measure 5.3-2(c):** *Avoid maternal roosting areas.* If active maternity roosts are found in trees or structures that will be removed or demolished as part of project construction, tree removal or demolition of that structure shall commence and be completed before maternity colonies form (generally before March 1) or shall not commence until after young are flying (generally after July 31). Active maternal roosts shall not be disturbed.
>
> **Mitigation Measure 5.3-2(d):** *Develop and employ bat nest box plan.* If special-status bats are found in trees or structures to be removed or demolished as part of project construction, Stanford shall develop and implement a Bat Nest Box Plan for the Stanford campus employing current bat nest box technology. The design and placement of nest

boxes shall be reviewed by an independent, qualified bat biologist and shall be consistent with Stanford's anticipated long-term planning and development activities.

Significance after Mitigation: Less than Significant.

Impact 5.3-3: Project activities could result in adverse effects on the San Francisco dusky-footed woodrat. (*Potentially Significant*)

As discussed in the Environmental Setting, the San Francisco dusky-footed woodrat is found on the Project site within the Academic Growth Boundary, primarily in the Lathrop Development District and at Lagunita and adjacent uplands. In addition, San Francisco dusky-footed woodrats are abundant on the Project site outside of the Academic Growth Boundary.

During construction of individual projects under the proposed 2018 General Use Permit, construction activities such as vegetation removal, grubbing, grading, or other ground disturbance activities in wooded or brushy habitats could result in direct impacts to dusky-footed woodrats. Direct impacts during construction could include mortality of adults or young, as well as destruction of woodrat stick nests.

Indirect impacts to dusky-footed woodrat due to increased predation caused by expanding the range of urban-adapted predators, such as raccoon and coyote and domestic cats would not occur because development of new academic and academic support and residential uses within the Academic Growth Boundary would occur in an urban environment, where these predator species are already present. Similarly, while this new development would introduce new sources of operation-related night-lighting and noise sources, given that development would occur within the urban environment inside the Academic Growth Boundary, the Project would not introduce increased nighttime lighting, noise or other human disturbances in areas where such conditions do not already exist. Consequently, Project operational impacts on the dusky-footed woodrat would be less than significant.

Project construction activities could result in potentially significant impacts to San Francisco dusky-footed woodrat.

The following mitigation measures would reduce the impacts of project construction to San Francisco dusky-footed woodrats to a level that is less than significant. If Mitigation Measure 5.3-3(a) is implemented, and no San Francisco dusky-footed woodrat nests are identified, no further mitigation measures are required. In the event that Mitigation Measure 5.3-2(a) identifies active nests, then implementation of Mitigation Measures 5.3-2(b) and/or (c) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 5.3-3(a):** *Surveys.* Prior to any clearing of vegetation within the Lathrop Development District, Lagunita and adjacent uplands, jurisdictional waterways/wetlands, or lands on the Project site outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a survey for San Francisco dusky-footed woodrat nests within the project area. The survey results shall

be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 5.3-3(b): *Avoidance***.** Where feasible, an exclusion buffer of at least 10 feet from these nests shall be established and clearly demarcated to avoid moving or bumping the nests or the logs or branches on which the nests rest.

Mitigation Measure 5.3-3(c): *Mitigation.* If establishing a buffer and avoiding the nests is not feasible, the nests shall be dismantled and the nesting material moved to a new location outside the project's impact areas so that it can be used by woodrats to construct new nests. Prior to nest deconstruction, each active nest shall be disturbed by a qualified wildlife biologist to the degree that all woodrats leave the nest and seek cover out of the impact area. Whether the nest is on the ground or in a tree, the nest shall be slightly disturbed (nudged) to cause the woodrats to flee. For tree nests, a tarp shall be placed below the nest and the nest dismantled using hand tools (either from the ground or from a lift). The nest material shall then be piled at the base of a nearby tree or large shrub outside of the impact area.

Significance after Mitigation: Less than Significant.

Impact 5.3-4: Project construction activities could result in adverse effects on special-status plant species. (*Potentially Significant*)

As discussed in the Environmental Setting, Project site lands outside the Academic Growth Boundary, and natural areas within the Academic Growth Boundary (the Lathrop Development District, Lagunita and adjacent uplands, and jurisdictional waterways/wetlands), contain potentially suitable habitat for rare, threatened or endangered plant species. During construction of individual projects under the proposed 2018 General Use Permit, construction activities such as grading and ground-disturbing activity in these locations could result in loss of rare, threatened or endangered plant species.

Project construction activities under the proposed 2018 General Use Permit could result in potentially significant impacts to special-status plant species.

The following mitigation measures would reduce impacts to special-status plant species to a level that is less-than-significant. If Mitigation Measure 5.3-4(a) is implemented, and no special-status plant species are identified, no further mitigation measures are required. In the event that Mitigation Measure 5.3-4(a) identifies such species, then implementation of Mitigation Measures 5.3-4(b) and/or (c) would reduce this impact to a less-than-significant level.

Mitigation Measure 5.3-4(a): *Surveys.* If construction is proposed within any jurisdictional waterways/wetland areas, Lagunita basin and adjacent uplands, the Lathrop Development District, or Project site lands outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a focused survey for special-status plant species prior to ground disturbance during the late winter/early spring period when most local native plant species are flowering and most easily identified. The survey results shall be provided to the County Planning Office prior to

issuance of site demolition, grading or building permits. If special status plant surveying during flowering period is not possible, development within sensitive habitat areas shall be avoided unless approved by CDFW and the County Planning Office.

Mitigation Measure 5.3-4(b): *Avoidance.* Construction activities shall avoid impacts to special-status plant species by establishing a buffer zone around the individuals in question. The buffer size shall be determined by an independent, qualified biologist approved by the County in order to avoid potential disturbance. The width of the buffer shall depend on a consideration of site-specific characteristics, including the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, soils, physical and chemical characteristics) and adjacent uses (e.g., sprinkler irrigation or shading from buildings or other structures). The buffer zone shall be clearly demarcated using exclusion fencing.

Mitigation Measure 5.3-4(c): *Mitigation if avoidance is not feasible.* If the County Planning Office determines that establishing an avoidance buffer is not feasible, individual plants (including seeds) shall be transplanted to an area with suitable physical and biological conditions on the Project site outside of the Academic Growth Boundary and monitored and adaptively managed for five years. Transplantation may be accomplished by relocating individual plants or through seed collection and dispersal, or a combination of both, to be determined based on the species.

Significance after Mitigation: Less than Significant.

Impact 5.3-5: Project activities would not result in significant effects on federal and state protected species covered by the Stanford Habitat Conservation Plan. (*Less than Significant*)

As described above in the Regulatory Setting, the USFWS-approved Stanford Habitat Conservation Plan (HCP) creates a comprehensive conservation program that protects, restores, and enhances habitat; monitors and reports on Covered Species; and minimizes impacts on the Covered Species and their habitats. The Stanford HCP outlines what Stanford will do to minimize or mitigate the impact of its activities on federally protected species. In turn, the USFWS has issued a long-term incidental take permit (ITP) that authorizes "take" of protected species associated with Stanford's activities related to academic uses, general campus management and maintenance, redevelopment, future development, and conservation programs.

As discussed above, in August 2013 the County of Santa Clara determined that the Stanford HCP provides at least as much habitat value and protection for the California tiger salamander (CTS) as that provided by the 2000 General Use Permit conditions for CTS protection, and therefore, that the Stanford HCP supersedes 2000 General Use Permit Conditions J.1 through J.8. In May 2016, CDFW issued a Consistency Determination, determining that the ITP issued by USFWS, including the incorporated measures in the HCP, is consistent with CESA, meeting the requirements set forth in California Fish and Game Code section 2081 for authorizing take of CESA-listed species (i.e., CTS). As a result, implementation of the Stanford HCP satisfies the requirements of both the federal and state endangered species acts. The three species covered by

the Stanford HCP and ITP are: California red-legged frog (CRLF); CTS; and San Francisco gartersnake. Because Stanford is required by USFWS to implement the HCP, impacts to Covered Species from project construction and operation would be less-than-significant.

Mitigation: None required.

Impact 5.3-6: Project activities could result in significant effects on steelhead. (*Potentially Significant*)

As discussed in the Environmental Setting, at the Project site steelhead are found exclusively outside the Academic Growth Boundary within the San Francisquito Creek watershed. While all new academic and academic support and residential development under the proposed 2018 General Use Permit would occur within the Academic Growth Boundary, Stanford could also construct certain infrastructure improvements, as well as on-going habitat improvements and conservation projects, outside the Academic Growth Boundary. For example, under the 2000 General Use Permit, Stanford implemented improvements in Project site creeks to remove barriers to steelhead migration and similar types of conservation projects could occur under the proposed 2018 General Use Permit.

As discussed in the Regulatory Setting, in 2015 the County approved a Special Conservation Area Plan that includes the following guidelines that would protect steelhead:

- No fishing is allowed;
- If water quality conditions detrimental to steelhead or other wildlife are discovered, the Conservation Program Manager will coordinate investigation of the source and feasible measures to reduce the adverse effect;
- Stanford and its tenants will maintain riparian canopy;
- Any proposed removal of trees in the hazard areas should be reviewed and approved by County staff and Stanford biologists;
- Prior to construction of any utilities, roads or other structures or infrastructure within the hazard areas, Stanford will conduct site-specific geotechnical analyses to ensure slope stability both during and after construction; and
- All work or maintenance should be scheduled outside the wet season (October 15 to March 15). If any work or maintenance must take place within the wet season, the Conservation Program manager must be consulted and may assign measures that reduce or avoid the risk of landslides.

These guidelines would serve to protect steelhead from construction and operational activities at Stanford, including those activities that would occur under the proposed 2018 General Use Permit.

In addition to implementing its Special Conservation Area Plan, Stanford must obtain permits and approvals from applicable federal and state wildlife and water quality agencies to perform work in creeks that support steelhead. Because proposed construction of infrastructure, as well as

on-going habitat improvement and conservation projects, could adversely affect steelhead by rendering habitat less hospitable in the short term due to increases in sediment loading and disturbance, construction activities would have a potentially significant impact on steelhead.

The following mitigation measures would serve to further ensure that impacts to steelhead would be reduced to a level that is less-than-significant. If Mitigation Measure 5.3-6(a) is implemented, and no work is conducted within 150 feet of top of bank of a creek, no further mitigation measures are required. In the event that implementation of Mitigation Measure 5.3-6(a) is infeasible, then implementation of Mitigation Measures 5.3-6(b) would reduce the significance of this impact to a less-than-significant level.

> **Mitigation Measure 5.3-6(a):** *Habitat avoidance*. Grading or ground-disturbing activities within 150 feet of the top of bank of a creek that supports steelhead shall be avoided.
>
> **Mitigation Measure 5.3-6(b):** *Protective measures*. If the County Planning Office determines that avoidance of steelhead habitat is not feasible, Stanford shall obtain any required permits and approvals from federal and state wildlife agencies as well as a Streambed Alteration Agreement. Such permits and approvals shall specify the conditions under which construction activities may occur, including any applicable construction windows, installation of coffer dams or other measures necessary to protect steelhead.
>
> **Significance after Mitigation:** Less than Significant.

Impact 5.3-7: Project activities could result in substantial loss or degradation of riparian habitat. (*Potentially Significant*)

Construction of infrastructure, habitat improvement and conservation projects including channel modifications and/or removal of man-made facilities and barriers to steelhead migration could occur within riparian habitat on the Project site outside of the Academic Growth Boundary. Stanford's activities in riparian areas are subject to the USFWS-approved Stanford HCP and the County-approved Special Conservation Area Plan which state that Stanford will protect habitat and use effective mitigation measures. Nevertheless, potential construction activity within riparian habitats on the Project site outside the Academic Growth Boundary could result in a significant impact to riparian habitat.

Project impacts to riparian habitat would be mitigated to less-than-significant levels through implementation of appropriate mitigation measures. If Mitigation Measure 5.3-7(a) is implemented, and no work is conducted within 150 feet of riparian habitat, no further mitigation measures are required. In the event that implementation of Mitigation Measure 5.3-7(a) is infeasible, then implementation of Mitigation Measures 5.3-7(b) would reduce the significance of this impact to a less-than-significant level.

> **Mitigation Measure 5.3-7(a):** Grading or ground-disturbing activities within 150 feet of riparian habitat shall be avoided.

Mitigation Measure 5.3-7(b): If the County Planning Office determines that avoidance is not feasible, Stanford shall obtain all appropriate permits for wetland or other work within the riparian area from the Corps, USFWS, NMFS and CDFW. As specified by agency permits, any riparian habitat areas lost as a result of project development would be replaced through the creation, preservation or restoration of equivalent habitat at an appropriate mitigation ratio or through other measures that the agencies deem appropriate and approve in order to adequately mitigate the impact.

Significance after Mitigation: Less than Significant.

Impact 5.3-8: Project activities could result in the loss of native oak woodland habitat. (*Potentially Significant*)

As discussed under the Regulatory Setting, under California Public Resources Code (PRC) Section 21083.4, counties are required to evaluate impacts to oak woodlands under CEQA, and determine whether a project's impacts to oak woodlands are significant. In response to this statute, the County of Santa Clara developed a set of significance criteria for impacts to oak woodlands, under which a decrease of 0.5-acre or more in the native oak canopy of an individual oak woodland is considered a significant impact.

As discussed under the Environmental Setting, an oak woodland/savannah community is present on the Project site within the Academic Growth Boundary in the Lathrop Development District. Oak woodland/savannah communities also are present on the Project site outside the Academic Growth Boundary. Potential removal of oaks within the oak woodland/savannah community as a result of Project development and/or infrastructure improvements in the Lathrop Development District, or necessary infrastructure improvements that may occur outside the Academic Growth Boundary, would have the potential to result in a significant direct impact to oak woodland.

Project operational activities would not be expected to result in indirect impacts to oak woodland because Project operations are not likely to introduce non-native plant species that outcompete native oak trees, or introduce Sudden Oak Death into the oak woodlands. Consequently, Project operational impacts on native oak woodland habitat would be less than significant.

Because there are no County-mapped oak woodland/savannah communities on the Project site, the mitigation measures specified by the Santa Clara County Planning Office Guide to Evaluating Oak Woodlands Impacts (last updated July 28, 2011) do not directly apply to the proposed Project; however, those measures provide a useful framework. The following mitigation measures, which are modeled on the Planning Office Guide to Evaluating Oak Woodlands Impacts, would reduce impacts to oak woodlands to a level that is less-than-significant:

Mitigation Measure 5.3-8(a): Prior to oak tree removal within the Lathrop Development District, a tree removal plan and arborist report shall be submitted which identifies the species type, acreage, diameter, and amount of canopy of oak trees proposed for removal. The arborist report shall be prepared by an I.S.A. Certified Arborist, Registered Professional Forester, or another professional approved by the County Planning Office.

Mitigation Measure 5.3-8(b): If the proposed oak tree removal would result in a decrease of 0.5-acre or more of native oak canopy on the project site, at least two of the following three mitigation measures shall be implemented:

1) *Planting Replacement of Oak Trees*. Pursuant to Public Resources Code Section 21083.4, the planting of oaks shall not fulfill more than 50 percent of the mitigation requirement for the project.

   Tree replacement can be dependent upon the size of the canopy of the removed trees, the number of trees to be removed, the size of trees to be removed, the type of trees to be removed, the steepness of the slope on which trees will be removed, or the amount of room on a parcel in which trees can be planted. The objective of tree planting shall be to restore former oak woodland at a ratio of 2:1 or 3:1 based on the condition of the oak woodland habitat. 2:1 restoration is recommended for medium quality oak woodland habitat, and 3:1 restoration is recommended for high quality oak woodland habitat.

   The following standard mitigation ratios shall be used, unless a different ratio is applied by the Planning Office based on site-specific characteristics:

   - For the removal of one small tree (5-18 inches): two 24-inch boxed trees or three 15 gallon trees.
   - For the removal of 1 medium tree (18-24 inches): three 24-inch boxed trees or four 15 gallon trees.
   - For the removal of a tree larger than 24 inches: four 24-inch boxed trees or five 15 gallon trees.

   All tree replacement shall be with in-kind species, unless alternate species are approved by the county. A Tree Planting and Maintenance Plan shall be submitted showing species, size, spacing and location of plantings and the location and species of established vegetation. Tree plantings shall be monitored for five years following planting and a survival rate of 75% will be required. Should the planted trees fail to meet the established performance and survival criteria, Stanford shall be responsible for additional plantings and management activities necessary to ensure the long-term success of planted mitigation trees.

2) *Conservation Easement.* Protect existing native oak trees on or off the project site from future development through a conservation easement or fee title dedication to the County or a land conservation group approved by the County.

   Oak woodland offered as mitigation must be configured in such a manner as to best preserve the integrity of the oak ecosystem and minimize the ratio of edge to area. Priority should be given to conserving oak habitat adjacent to existing woodlands under conservation easements, public lands or open space lands. The protection of existing oak woodlands through conservation easements shall mitigate for the loss of oaks at a ratio equal to 2:1 (for medium quality oak woodland habitat) or 3:1 (for high quality oak woodland habitat) as determined by the County Planning Office. Land proposed as mitigation, when viewed with adjacent protected conservation land, should not result in conserved parcels of less than one acre.

3) *Other Options*. If the County Planning Office determines that there are no feasible sites for oak woodland mitigation on Stanford lands, then Stanford shall submit a plan for review and approval by the County Planning Office that provides for the conservation of oak woodlands elsewhere in Santa Clara County in the same manner as 5.3-8(b)(2).

   This plan must include protection of an existing oak ecosystem through a conservation easement or fee title dedication to the County or other local agency or organization responsible for the oak woodlands preservation.

Significance after Mitigation: Less than Significant.

Impact 5.3-9: Project construction activities could result in substantial adverse effects on jurisdictional waters and wetlands. (*Potentially Significant*)

Construction of new buildings and infrastructure, and on-going habitat enhancements/ improvements and conservation projects could necessitate filling or altering waters and wetlands that qualify as "waters of the United States" and fall under federal jurisdiction pursuant to the Clean Water Act, as well as other waters under state authority pursuant to the California Water Code. Alteration may occur through sediment delivery, discharge of contaminants, or interruption of hydrological flow. For example, additional removal of barriers to steelhead migration that may be undertaken by Stanford would likely involve work within jurisdictional waters. As another example, construction and enhancement of breeding ponds for CTS or CRLF could require work within jurisdictional wetlands. While only a small quantity of jurisdictional waters or wetlands are located in areas upon which new building development under the 2018 General Use Permit could be constructed, it is possible that infrastructure and habitat enhancement improvements could indirectly affect jurisdictional waters and wetlands in all locations in which such features are present.

Project construction activities could result in potentially significant impacts to jurisdictional waters and wetlands.

Project impacts to jurisdictional waters and wetlands would be mitigated to less-than-significant levels through implementation of the following mitigation measures:

Mitigation Measure 5.3-9(a): *Jurisdictional waters and wetland identification.* Stanford has provided a wetland delineation that covers the lands within the Academic Growth Boundary. Prior to grading or ground-disturbing activities on lands outside the Academic Growth Boundary, the County shall determine whether the existing wetland delineation is adequate to assess the project's impacts and, if not, an independent, qualified wetland biologist approved by the County shall delineate jurisdictional waters or wetlands on and within 250 feet of the construction site.

Mitigation Measure 5.3-9(b): *Jurisdictional waters and wetlands avoidance.* For all projects grading or ground-disturbing activities within 250 feet of jurisdictional waters or wetlands shall be avoided unless the County Planning Office determines that avoidance is not feasible.

Mitigation Measure 5.3-9(c): *Jurisdictional waters or wetland replacement.* If the County Planning Office determines that avoidance of jurisdictional waters or wetlands is not feasible, Stanford shall obtain all appropriate permits or approval for work in jurisdictional waters (i.e., Waters of the State or Waters of the U.S.), from applicable agencies, including but not necessarily limited to, the U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, and California State Department of Fish and Wildlife. Any jurisdictional waters or wetlands that are filled as a result of project development shall be replaced through the creation, preservation or restoration of jurisdictional waters or wetlands or through other measures that the agencies deem appropriate through permit requirements to adequately mitigate the impact. Potential measures may include the following:

- For creek projects, remove hardscape features from the stream channel and stream banks.
- Stabilize exposed slopes or streambanks immediately upon completion of construction activities.
- To restore disturbed aquatic sites, a wetland mitigation and monitoring plan will be prepared that outlines the objectives to mitigate for construction impacts. At a minimum the plan will include thresholds of replanting success (e.g., 90 percent plant survival after one year, 80 percent second year, and 70 percent third year), monitoring requirements (e.g., at least once each year to confirm site stability, plant viability, and to schedule weeding, as needed), and shall specify resource agency reporting requirements.

Significance after Mitigation: Less than Significant.

Impact 5.3-10: Implementation of the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant*)

Grassland, oak woodland/savannah, riparian woodland and creeks, chaparral and scrub, seasonal wetlands, and perennial standing water areas of the Project site outside of the Academic Growth Boundary can provide movement corridors and nursery sites for fish and wildlife. While construction activities associated with infrastructure improvements and on-going habitat enhancement improvements could temporarily impede wildlife movement, such improvements would not result in substantial long-term interference. Implementation of the required USFWS-approved Stanford HCP and County-approved Special Conservation Area Plan measures would ensure that impacts to movement corridors and nursery sites for fish and wildlife on Project site lands outside the Academic Growth Boundary would be less-than-significant.

Within the Academic Growth Boundary on the Project site, the oak woodland/savannah community within the Lathrop Development District and Lagunita and adjacent uplands can provide movement corridors for the CTS. Implementation of the required USFWS-approved

Stanford HCP avoidance measures would ensure that impacts to movement of the California tiger salamander would be less-than-significant.

Mitigation: None required.

Impact 5.3-11: Implementation of the project could conflict with local Santa Clara County tree preservation ordinance. (*Potentially Significant*)

Construction of project academic facilities, housing units and infrastructure improvements could result in the need to remove trees that are protected by the Santa Clara County tree preservation ordinance. A 2014 interpretation memo (see Appendix BIO) documented the manner in which the County tree preservation ordinance shall be applied at Stanford.

Notwithstanding the protections provided by the County tree preservation ordinance, Project construction activities could result in potentially significant impacts to protected trees. The following mitigation measures would ensure compliance with the County's tree preservation ordinance:

Mitigation Measure 5.3-11(a): A "tree" is defined a woody plant having a single trunk measuring at least 37.7 inches in circumference (12 inches or more in diameter) or in the case of multi-trunk trees, a trunk size of 75.4 inches in circumference (24 inches in diameter). A protected tree on the Stanford campus is a:

- heritage tree (if included on the County's heritage resource inventory adopted by resolution of the Board of Supervisors);
- a tree planted or retained as required by conditions of approval of County permits;
- and a tree located within County rights-of-way and easements.

Stanford shall not remove a protected tree unless:

1. Removal of the protected tree is authorized by a County land use approval for which a grading or building permit has been issued.

2. Removal of the protected tree is authorized by a County-issued administrative permit or encroachment permit for tree removal; or

3. Removal of the protected tree is exempt. In addition to trees removed pursuant to a County land use approval, the ordinance currently exempts removal of a protected tree in the following circumstances:

    - the tree is diseased, dead, or dying or substantially damaged from natural causes;
    - tree cutting is needed to remove a hazard to life and personal property; and
    - maintenance work within public utility easements

Mitigation Measure 5.3-11(b): Issuance of a land use permit, administrative permit or encroachment permit that authorizes removal of a protected tree shall be conditioned as follows:

1. Protected trees shall be replaced at a ratio of 3:1 for oaks and 1:1 for other protected trees; or

2. Stanford may submit a Vegetation Management Plan for the entire campus to the County Planning Office for review and approval. This plan must provide for the same or greater level of tree protection as the measures described in Mitigation Measure 5.3-11(b)(1).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 5.3-12: Implementation of the Project could cumulatively cause an adverse impact to biological resources. (*Potentially Significant*)

Cumulative impacts analysis considers the effects of Project implementation in combination with those of proximate past, present, and reasonably foreseeable future projects, and whether the project's contribution to the cumulative impact would be significant. Stanford's lands outside the Academic Growth Boundary in unincorporated Santa Clara County are relatively isolated, covering a large area adjacent to other largely undeveloped lands, including Stanford's 1,200-acre Jasper Ridge Biological Preserve, which is maintained for research and education and closed to recreational use. On the Stanford HCP lands, which include most of the Project site as well as adjacent Stanford-owned land in the City of Palo Alto, creek restoration, invasive species removal and vegetation management activities are ongoing. These activities may cause minor disturbance to habitat areas, but the long-term impact would be beneficial to sensitive natural communities and to special status plants and wildlife.

Stanford is also considering a range of alternatives at the Searsville dam and reservoir that could provide fish passage, allow natural annual sediment load to flow downstream, create a replacement water diversion downstream, and relocate Searsville water storage functions to an expanded Felt Reservoir. Stanford acknowledges that such improvements would require comprehensive and coordinated collaboration with federal, State and local agencies, including the San Francisquito Creek Joint Powers Authority (SFCJPA), its local government members, and local community and residents in the watershed (Stanford, 2015). No specific alternative has been selected or approved at this time.

In addition, the SFCJPA is currently undergoing environmental review of a range of alternatives to address flow capacity deficiencies in San Francisquito Creek to reduce flooding potential, and enhance ecosystems and recreation. Alternatives include potential channel and/or potential bypass improvements within the creek downstream of Stanford; and constructing one or more detention basin improvements, including on Stanford lands within the Project site (e.g., Lagunita, Felt Reservoir) and outside the Project site (e.g. Searsville Reservoir and within the Jasper Preserve) (SFCJPA, 2016). No specific alternative has been selected or approved at this time.

Otherwise, urbanized areas of adjacent jurisdictions, including within Palo Alto, are adjacent to largely developed areas of the Project site (i.e., those areas within the Academic Growth Boundary).

As discussed in Chapter 5.0, Stanford is currently in the midst of constructing the remaining housing and academic and academic support facilities authorized under the 2000 General Use Permit within the Academic Growth Boundary. While the timing of construction has the potential to increase temporary impacts on biological resources from tree removal, noise disturbance, and other impacts, impacts would be limited to the immediate construction area within the Academic Growth Boundary, which has limited biological value. Additional non-Project cumulative development in adjacent jurisdictions would be expected to continue to occur over the duration of the 2018 General Use Permit and would be subject to applicable regulations and environmental review requirements of those jurisdictions.

Special Status Plants and Wildlife

As discussed above, activities under the proposed 2018 General Use Permit could result in potential impacts to special-status plants and wildlife. Implementation of the specified Mitigation Measures 5.3-1(a)-(e), 5.3-2(a)-(d), 5.3-3(a)-(c), 5.3-4(a)-(b), and 5.3-6(a)-(c) would require plant and nesting bird, bat, and dusky-footed woodrat surveys and avoidance and minimization of potential impacts to special-status species and their habitat, including corridors; and reduction of any potentially impacts to special-status plants and wildlife to a less than significant level. Other cumulative development projects outside the Project site would also contribute to the incremental loss of undeveloped natural lands that provide habitat for special-status species. These cumulative projects would also be required to comply with applicable federal and State regulations protecting special-status species through implementation of similar mitigation measures during construction by those jurisdictions. Activities associated with the proposed 2018 General Use Permit would cause relatively minor loss of undeveloped habitat in the area, principally within the Academic Growth Boundary. However, with the implementation of these measures, the proposed Project would not have a cumulatively considerable contribution to impacts on special status species.

Nesting Birds

As discussed above, activities under the proposed 2018 General Use Permit could result in potential impacts nesting migratory birds, including special-status species. Implementation of Mitigation Measure 5.3-1(a)-(b), would require preconstruction nesting bird surveys and avoidance of known nest sites, thereby minimizing this impact to a less than significant level. The area surrounding the Project site also contains many trees and shrubs provide habitat for nesting migratory birds, including special-status species; thus, there is potential for cumulative development projects to impact nesting birds during construction. Other cumulative projects for creek restoration, invasive species removal and vegetation management may also impact nesting birds, but would also be required to comply with applicable regulations protecting nesting birds, through implementation of similar mitigation measures during construction by those jurisdictions. With the implementation of these measures, the proposed Project would not have a cumulatively considerable contribution to impacts on nesting birds.

Steelhead

The Project site contains a segment of San Francisquito Creek that provides habitat for steelhead. As discussed above, in addition to implementing the County Special Conservation Area Plan guidelines to minimize disturbance to steelhead, Stanford must obtain permits and approvals from

applicable federal and state wildlife and water quality agencies to perform work in creeks that support steelhead; see Mitigation Measure 5.3-6(a)-(c). These permits, including a Streambed Alteration Agreement, specify the conditions under which construction activities may occur, including construction windows, cofferdams or other measures necessary to protect steelhead. Other cumulative projects would also be required to comply with applicable federal and State regulations protecting steelhead and other fish, through implementation of similar mitigation measures during construction by those jurisdictions. With the implementation of these measures, the proposed Project would not have a cumulatively considerable contribution to impacts on steelhead.

Wetlands, Waters and Sensitive Riparian Communities

Construction under the proposed 2018 General Use Permit could result in impacts to riparian habitat or jurisdictional waters of the United States and waters of the State. As discussed above, Mitigation Measures 5.3-7(a)-(b) and 5.3-9(a)-(c) would minimize disturbance, and mitigate for necessary disturbance to sensitive riparian areas, wetlands and waters. Other cumulative development projects outside the Project site would also contribute to impacts to drainages and seasonal wetlands. As with special-status species, cumulative projects would be required to comply with applicable federal and State regulations protecting riparian habitat and jurisdictional waters by those jurisdictions. The potential Project impacts in combination with other projects would not contribute to a cumulatively significant impact on riparian habitat, and jurisdictional waters of the United States and waters of the State, including drainages and seasonal wetlands.

Oak Woodlands

As discussed above, construction under the proposed 2018 General Use Permit could result in impacts to sensitive oak woodland habitat from ongoing and future development projects. Mitigation Measures 5.3-8(a)-(b) and 5.3.11(a)-(c) would minimize disturbance and mitigate for necessary disturbance to oak woodlands, including protected trees. Other cumulative projects outside the Project site would also be required to comply with applicable federal and State regulations protecting oak woodlands of those jurisdictions. The potential Project impacts in combination with other projects would not contribute to a cumulatively significant impact on oak woodland communities.

As discussed above, all biological impacts associated with construction and operation of the proposed 2018 General Use Permit would be mitigated to a less than significant level. There are no biological impacts of the Project that, when considered in combination with other cumulative development, would make a considerable contribution to cumulative effects.

> **Mitigation:** Implement Mitigation Measures 5.3-1(a)-(b), 5.3-2(a)-(d), 5.3-3 (a)-(c), 5.3-4(a)-(b), 5.3-6(a)-(c), 5.3-7(a)-(b), 5.3-8(a)-(b), 5.3-9(a)-(c), and 5.3.11(a)-(c).
>
> **Significance after Mitigation:** Less than Significant.

5.3.6 References

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5.4 Cultural and Paleontological Resources

5.4.1 Introduction

This section addresses potential for the proposed 2018 General Use Permit to significantly impact cultural resources (including architectural resources, prehistoric and historic-period archaeological resources, human remains, and tribal cultural resources) and paleontological resources. The section includes a description of the existing and 2018 baseline environmental settings as it relates to these resources, and provides a regulatory framework that discusses applicable federal, State, and County regulations. The section includes an evaluation of potential significant impacts of the proposed Project on cultural and paleontological resources, and identifies regulatory mechanisms and/or feasible mitigation measures to ensure potentially significant impacts associated with these resources would be minimized to the maximum extent feasible. The section relies in part on an Historic Resources Report prepared by Stanford in support of its 2018 General Use Permit application (see Appendix HIS), and an archaeological resources map for Stanford that is on file at the County of Santa Clara Planning Office. These sources of information were peer reviewed by a qualified architectural historian, and registered professional archaeologist, respectively, at ESA. Please also see Section 5.11, Noise and Vibration, for a discussion of potential effects of construction-related vibration to historic buildings.

5.4.2 Existing Environmental Setting

Natural Environment

The Bay Area and the surrounding region contain an abundance of natural resources, which were taken advantage of by its prehistoric and early historic-period people. Deer, elk, and waterfowl were plentiful in prehistory, as were marine and Bay resources such as seals, otters, abalone, mussels, oysters, clams and numerous fish species. Franciscan chert was an easily obtainable local raw material used for stone tools. Obsidian, another material used in tool making, could be obtained from the Anadel and Napa Glass Mountain quarries north of the Bay Area.

Prehistoric Context

Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. Milliken et al. (2007) provide a framework for the interpretation of the San Francisco Bay Area and divide human history of the region into four periods: the *Paleoindian Period* (11,500 to 8000 B.C.), the *Early Period* (8000 to 500 B.C.), the *Middle Period* (500 B.C. to A.D. 1050), and the *Late Period* (A.D. 1050 to 1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during *Paleoindian Period* has not yet been discovered in the

San Francisco Bay Area. During the *Early Period* (*Lower Archaic*; 8000 to 3500 B.C.), geographic mobility continued from the *Paleoindian Period* and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are documented in burials during the *Early Period* (3500 to 500 B.C.), indicating the beginning of a shift to sedentism.[1] During the *Middle Period*, which includes the *Lower Middle Period* (500 B.C. to A.D. 430), and *Upper Middle Period* (A.D. 430 to 1050), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first known rich midden sites[2] are recorded from this period. By the *Upper Middle Period*, highly mobile hunter-gatherers were increasingly settling down into numerous small villages. During the *Late Period*, social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

Prehistoric Resources on Project Site and Vicinity

Beginning in the 1920s, archaeological sites located on Stanford lands were identified and recorded by the faculty and students. The first systematic investigation of the Stanford lands,[3] was conducted in 1986 by the University Archaeology program. Stanford's Archaeologist and Director of Heritage Services maintains a comprehensive inventory of prehistoric site locations and information. A total of 73 prehistoric archaeological sites (including isolated finds, lithic concentrations, milling stones, petroglyphs, occupation sites, and burial sites) have been identified and recorded on Stanford lands. Of these, 23 prehistoric sites have been recorded in the Project site, with one of these sites located within the Academic Growth Boundary and the other 22 sites outside of the Academic Growth Boundary (Jones, 2017).

Ethnographic Context

Based on a compilation of ethnographic, historic, and archaeological data, Milliken (1995) describes a group known as the Ohlone, who once occupied the general vicinity of the Project site. While traditional anthropological literature portrayed the Ohlone peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between Ohlone villages. The Ohlone once occupied a large territory from San Francisco Bay in the north to the Big Sur and Salinas Rivers in the south. The Project site is in the greater *Puichon* tribal area (Milliken et al., 2009). At least one *Puichon* village, *Ssipùtca*, was located along San Francisquito Creek, outside of the Project site.

1 The practice of living in one place for a long time.
2 A midden is an old dump for domestic waste which may consist of animal bone, human excrement, botanical material, mollusc shells, sherds, lithics (especially debitage), and other artifacts and ecofacts associated with past human occupation.
3 References to "Stanford lands" in this section include the 8,180 contiguous acres of Stanford-owned lands within unincorporated areas of Santa Clara County and San Mateo County, and the cities of Palo Alto, Menlo Park, Portola Valley and Woodside. References to "Project site" in this section include only to those Stanford lands within the unincorporated County (i.e., the Project site boundary).

Economically, Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources. After European contact, Ohlone society was severely disrupted by missionization,[4] disease, and displacement. Today, although there are no federally-recognized Ohlone tribes, the Ohlone still have a strong presence and are active in protecting their historic and prehistoric past.

Historic Background

Spanish explorers in the late 1760s and 1770s were the first Europeans to explore the San Francisco Peninsula. After an initial period of exploration, the Spanish focused on the founding of presidios, missions, and secular towns with the land held by the Crown. Following the favorable reports by Anza and Font, the Spanish moved to occupy the lands in the Santa Clara Valley founding both the Pueblo de San José and the Mission Santa Clara de Asis in 1777. The Pueblo of San José de Guadalupe was California's first civilian settlement, and one of three towns founded to administer and coordinate the missions and presidios of Alta California. The Mission Santa Clara provided for the religious needs of the Pueblo and, as one of seven missions located within Ohlone territory, would have been the mission with the greatest impact on the aboriginal population living on the Peninsula.

Mexico gained its independence from Spain in 1821 and the territory known as Alta California, extending as far north as Sonoma County, became part of the Republic of Mexico. The Mexican government encouraged settlement of Alta California by issuing land grants to military veterans. The Franciscan missions lost control of most of their lands after 1833. Some former mission lands were granted to Native Americans who had served in the Mexican army, like the Rancho Polsomi grant to Inigo Garcia in Mountain View near the present site of Moffett Field. Land grants in and near the area that later became Stanford lands in unincorporated Santa Clara County included Rancho Rincon de San Francisquito and Rancho El Corte de Madera. Most of these "ranchos" were dedicated to raising cattle for the hide and tallow trade.

Mexican colonists often constructed their homes using a mixture of clay and straw known as "adobe." Two adobe houses were located on the Project site within the Academic Growth Boundary: the Buelna-Rodriguez Adobe north of the current Stanford Golf Course, and the Pena Adobe in the vicinity of the current Lagunita reservoir. The Pena Adobe site has not been located and may have been completely destroyed by the building of Lagunita dam and reservoir in the 1880s. The Buelna-Rodriguez Adobe stood as a ruin until the 1950s.

Early Pioneers

Pioneer settlers on the Stanford lands included Delvan Hoag, William Reynolds, George Gordon, Job J. Felt, Henry P. Coon, and Peter Coutts (known as The Frenchman). Delvan Hoag is the earliest known settler to farm on what would become Leland Stanford's Palo Alto estate. Hoag arrived in San Francisco in August of 1854 and purchased 930 acres of land along San Francisquito Creek. In 1857, Reynolds acquired approximately 1,500 acres of Rancho El Corte De Madera south of San Francisquito Creek and east of Los Trancos Creek. Gordon acquired more than 624 acres

[4] Missionization is a term that references a historical process of religious evangelism.

southwest along San Francisquito Creek in 1863. Felt purchased Reynolds' farm. Coon purchased 300 acres at the confluence of the San Francisquito and Los Trancos creeks from Felt in 1870. Coutts made multiple purchases to acquire the 1,402 acres that would become his estate, which included portions of the Rincón de San Francisquito and Rinconada del Arroyo de San Francisquito ranchos. All of these early pioneers engaged in some level of agricultural production on these properties prior to the Stanfords' ownership. The Coutts house (Escondite Cottage), his library (Tower House), and his Buttery have survived in good condition and are located on the Project site within the Academic Growth Boundary. In addition, the ruins of "Frenchman's Lake" are located in the faculty housing area and a brick water tower ("Frenchman's Tower") has survived along Matadero Creek, on the Project site outside the Academic Growth Boundary.

Leland Stanford's Palo Alto Stock Farm

Leland and Jane Stanford made a multi-million dollar fortune building and investing in the first successful transcontinental railroad, which was completed in 1868. They moved from Sacramento (Leland Stanford had served as California's first Republican governor during the Civil War) to San Francisco in 1873 and began building a Gilded-Age mansion on Nob Hill in San Francisco. They also began purchasing properties in both Santa Clara and San Mateo counties that ultimately formed their country estate in June 1876. Stanford maintained an interest in agriculture throughout his life, and the development of the Palo Alto Farm afforded him ample opportunity to practice agriculture.

Stanford established a variety of agricultural uses on the land including farmed row crops, livestock, and a trotting track. The remnants of Stanford's farming operations include the National Register of Historic Places (National Register)-listed Palo Alto Stock Farm Stable ("Red Barn"), the adjacent Brick Stable, and Superintendent's House.

Stanford University

The Stanfords founded Stanford University in memory of their child, Leland Stanford, Junior, who died at the age of 15. Leland Stanford contacted landscape architect Frederick Law Olmsted early in 1886. At the time, Olmsted had already earned a national reputation for transforming cities by designing parks, the best known being Central Park in New York City. His style, usually described as "naturalistic" or "picturesque," avoided formal design. Henry Sargent Codman, a particularly gifted apprentice who had a strong background in formal design, also contributed to the Stanford campus design. While Olmsted was focused on respecting the California landscape, Stanford's preference was for California-style architecture. Olmsted's preference for a naturalistic design that would allow smaller individual buildings to be scattered about the foothills amid trees and shrubbery prompted him to lobby for a site near or on the foothills that lay on the southeast edge of the Palo Alto estate. The Stanfords wanted a formal and structured set of buildings on the plain between their house and stables. Intent on expressing the memorial nature of the design, they wanted impressive buildings that were suitably grand and monumental in scale. By the end of September 1886, Leland Stanford selected the plain at the base of the foothills, which would also better allow for systematic expansion.

To design the first campus buildings, Leland Stanford hired the architecture firm of Shepley, Rutan and Coolidge during the fall of 1886. The firm was created by former employees of noted

Boston architect Henry Hobson Richardson, who had recently died. Charles A. Coolidge was the principal architect for the Stanford project, drawing heavily on both the design characteristics of the Richardsonian Romanesque style and on specific drawings left behind by Richardson as his inspiration.

The immediate mandate was the completion of the thirteen buildings of the Inner Quadrangle. These were a nearly identical series of one-story boxes, connected by a shaded arcade. The thick masonry walls, tile roofs, sheltering arcades and high ceilings were perfectly suited to a warm climate. A railroad spur line was laid to this site, and sandstone quarried in the southern Santa Clara valley was shipped in to be dressed on site by stone masons. Steam technology was also used to provide heat to the campus buildings through an extensive network of steam tunnels and a boiler plant.

A detailed description of the evolution of the campus design and each of the buildings is included in the Historic Resources Report (Appendix HIS).

Historic Resources on the Stanford Campus

The Santa Clara County Heritage Resource Inventory (County Inventory) is the County's official listing of historic sites within the unincorporated areas of the County (see Regulatory Setting, below, for additional detail). The County Inventory includes the following 20 resources located within the Project site, all but one of which are located within the Academic Growth Boundary:

1. Stanford University Main Quadrangle and Memorial Church – 450 Serra Mall
2. Cecil H. Green Library West – 459 Lasuen Mall
3. Cooksey (Synergy) House – 550 San Juan Street
4. Dunn-Bacon House – 565 Mayfield Avenue
5. Durand-Kirkman House – 623 Cabrillo Avenue
6. Encina Hall – 616 Serra Street
7. Escondite Cottage – 150 Comstock Circle
8. Fire Truck House – 433 Santa Teresa Street
9. Frenchman's Tower – Page Mill Road
10. Griffen-Drell House – 556 O'Connor Lane
11. Hanna House – 737 Frenchman's Road
12. Hesperides – 766 Santa Ynez Avenue
13. Hoover Tower – 550 Serra Mall
14. The Knoll – 660 Lomita Court
15. Leland Stanford Junior Museum – 328 Lomita Drive
16. Lou Henry Hoover House – 623 Mirada Avenue
17. Owen House – 552 O'Connor Lane
18. Red Barn-Palo Alto Stock Farm – 119 Fremont Road
19. Thomas Welton Stanford Gallery – 419 Lasuen Mall
20. Tower House-Frenchman's Library – 860 Escondido Road

In support of the proposed 2018 General Use Permit, Stanford completed a Historic Resources Report that includes a comprehensive identification of historic resources on the Project site. This report includes an inventory and evaluation of all historic-age buildings (i.e., more than fifty years

old) within all areas of the Project site that are designated as Academic Campus by the Stanford Community Plan.[5] Nearly 400 buildings were evaluated using the Historic Context that was developed in the Historic Resources Report, resulting in the identification of 74 historic buildings. The 74 buildings were recorded as 42 collegiate properties. (e.g., Stanford's Main Quadrangle contains 27 significant buildings connected by arcades.) In addition, eight non-collegiate properties were found eligible for listing, for a total of 50 historic properties. The buildings and structures were evaluated for significance using standard criteria set out in regulation (see Regulatory Setting, below).

The following property was found eligible under Criteria 1 (Events):

1. Main Quadrangle (27 buildings)

The following properties were found eligible under Criteria 2 (Persons):

1. Main Quadrangle (27 buildings)
2. Cantor Arts Center (Stanford Museum)
3. Sapp Center (Old Chemistry)
4. Old Union
5. Hoover Tower
6. Palo Alto Stock Farm Stable
7. Brick Stable
8. Encina Hall

The following properties were found eligible under Criteria 3 (Architecture):

1. Main Quadrangle (27 buildings)
2. Sapp Center (Old Chemistry)
3. Encina Hall and Commons (2 buildings)
4. Cantor Arts Center (Stanford Museum)
5. Lasuen House
6. Hammarskjold
7. Hillel-Ziff Center (Dunn-Bacon House)
8. Cooksey House (Synergy)
9. Owen House
10. Griffen-Drell House
11. Roble Hall
12. School of Education
13. Old Union Complex (3 buildings)
14. Art Gallery
15. Cecil H. Green Library
16. Burnham Pavilion
17. Knoll
18. Green Library
19. Bachtel International Center
20. Toyon Hall
21. Branner Hall
22. Kingscote
23. Black House
24. La Maison Francaise
25. Roble Gym
26. Hoover Tower
27. Lagunita Court
28. Memorial Hall
29. Slavianskii Dom
30. 717 Dolores
31. Center for Advanced Study in the Behavioral Sciences – 8 buildings

[5] As described in Chapter 3, Project Description, the proposed 2018 General Use Permit does not apply to land uses within those areas that are permitted as of right. The single-family and two-family residences in the faculty/staff subdivision are permitted as of right, and therefore were not included in the historic inventory. In addition, under the 2018 General Use Permit Stanford does not propose development in two areas zoned for medium-density faculty and staff housing (the Peter Coutts housing area and the Olmsted Terrace housing area); within the areas designated as Campus Open Space; or within any areas that are outside the Academic Growth Boundary. Therefore, these areas similarly are not included within the historic survey. However, faculty/staff housing rental units located in the Searsville and Olmsted staff housing subdivisions, and the Gardiner Apartments building on Mayfield Avenue were included in the survey.

These properties are illustrated in **Figure 5.4-1**.

Archaeological Resources on the Stanford Campus

Stanford's Archaeologist and Director of Heritage Services maintains a database of archaeological sites on Stanford lands, including a review of historic-period sites (i.e., sites that date from the initial time of Euroamerican contact in the Bay Area). Using County records, maps, and other documents, Stanford established the possible locations of historic-period archaeological sites (e.g., remains of buildings, privies, trash pits). Using these data, Stanford monitors construction activities and conducted test excavations at several historic-period archaeological sites. A total of 24 historic-period archaeological sites have been identified within the Project site, with seven of these sites identified within the Academic Growth Boundary (Jones, 2017).

Paleontological Setting

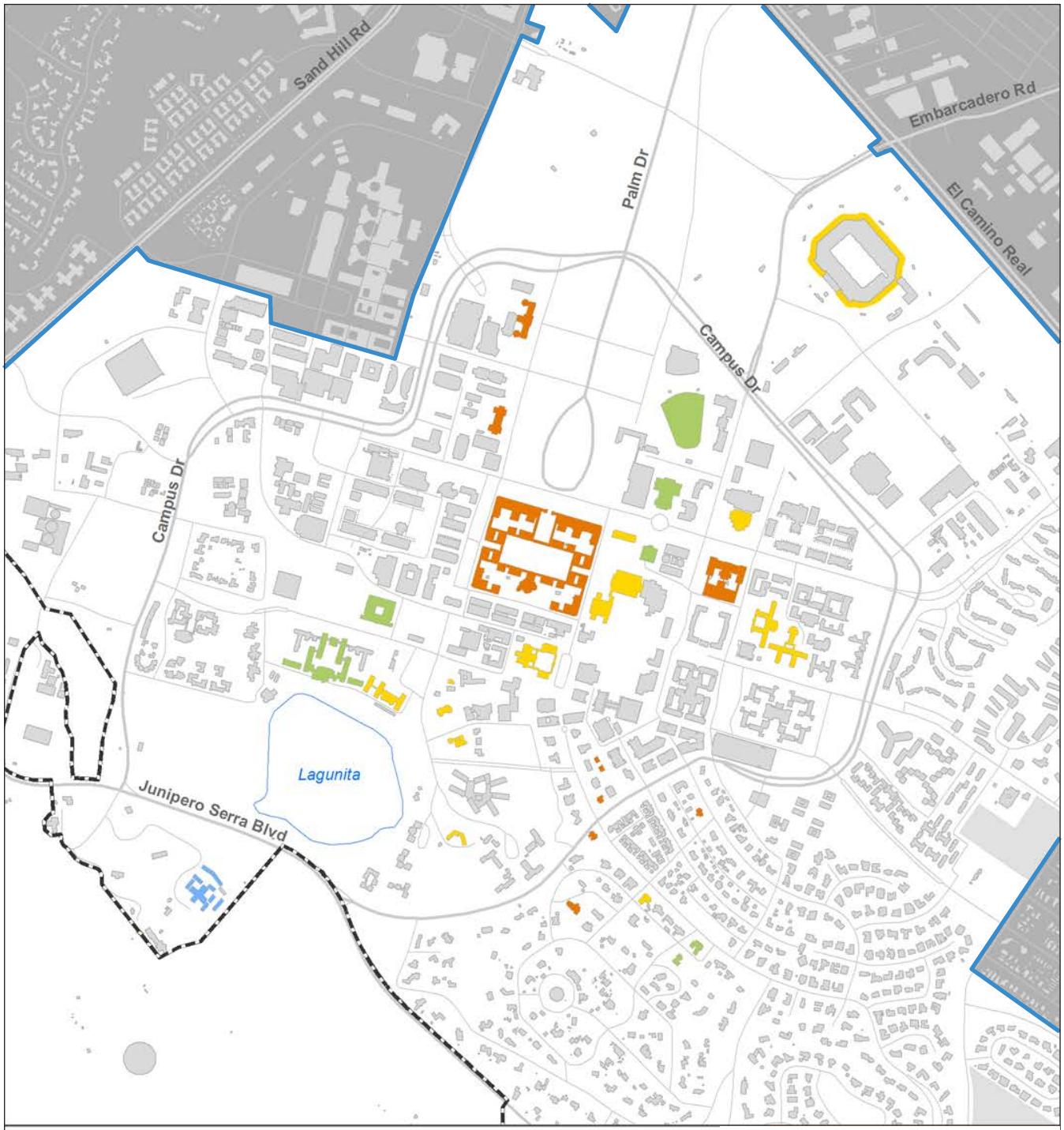
Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found.

Paleontological Assessment Guidelines

The Society of Vertebrate Paleontology (SVP) has established standard guidelines (SVP, 1995; SVP, 2010) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. In addition, most state regulatory agencies with paleontological resource-specific Laws, Ordinances, Regulations, and Standards (LORS) accept and use the professional standards set forth by the SVP.

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation are also considered to be critically important (Scott and Springer, 2004).

Based on the significance definitions of the SVP (1995), all identifiable vertebrate fossils are considered to have significant scientific value because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. The SVP identifies all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. In its "Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Non-renewable



SOURCE: Stanford LBRE LUEP, 2017

Stanford 2018 General Use Permit . 160531

Figure 5.4-1
Eligible Collegiate Buildings at Stanford

Paleontologic Resources," the SVP (1995:23) defines four categories of paleontological sensitivity (potential) for rock units: high, low, undetermined, and no potential:

- **High Potential.** Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant nonrenewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontologic resources. Also classified as significant are areas that contain organic remains older than Recent, and areas that may contain new vertebrate deposits, traces, or trackways.
- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.
- **Undetermined Potential.** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials.
- **No Potential.** Metamorphic and granitic rock units generally do not yield fossils and therefore have no potential to yield significant non-renewable fossiliferous resources.

The SVP states that a geologic unit known to contain significant fossils is considered to be "sensitive" to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either directly or indirectly disturb or destroy fossil remains (SVP, 1995).

As fossils are contained within surficial sediments or bedrock, they are generally not observable or detectable unless exposed by erosion or human activity. Therefore, the quality or quantity of fossils in any rock formation is unknown prior to natural erosion or human-caused exposure. As a result, even in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit, a similar geologic unit, or based on whether the unit in question was deposited in a type of environment that is known to be favorable for fossil preservation.

Paleontological Resources Potential on Project Site and Vicinity

As described in Section 5.6, Geology and Soils, geologic units in the Project site consist of bedrock in the sloping and higher elevation areas. Lower sections of the Project site are underlain by alluvial deposits. The alluvial deposits overlie bedrock from the Franciscan Complex, which is encountered at depths of more than 600 feet in the campus vicinity. Based on the SVP guidelines, with the exception of alluvium, all of these geologic units have a high paleontological potential.

EIRs prepared for the two previous Stanford General Use Permits (EIP, 1989:15-7; Parsons, 2000:4.9-6) reported that the University of California Museum of Paleontology (UCMP) recorded five paleontological localities on or near Stanford lands, including off-site near the SLAC National Accelerator Laboratory where a Paleoparadoxia[6] was uncovered, the best-preserved and most

[6] A paleoparadoxia is a large, herbivorous aquatic mammal from the Miocene epoch, 20 to 10 million years ago.

complete skeleton for this mammal found outside of China. The other sites contained the upper leg bone of a seal, an Allosdemus hip bone, a bison humerus recovered from an excavation off-site at the Stanford Medical Center, and the remains of other marine mammals (Parsons, 2000:4.9-6).

Other paleontological resources collected on Stanford lands include isolated fragments of fossil ribs and lower limbs from late Pleistocene mammals, and numerous marine fossils such as clams and snails (EIP, 1989:15-8). In addition, the UCMP database lists dozens of Cretaceous-age microfossils identified on Stanford lands (UCMP, 2017).

Additional fossil localities elsewhere in the Project site vicinity include a large mastodon tusk in the bank of San Francisquito Creek and two fragments of fossilized bone near the Veterans' Administration Hospital in Palo Alto and on Junipero Serra Boulevard west of Page Mill Road (EIP, 1989:15-7).

5.4.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

There are no substantive changes anticipated between the existing environmental setting described above and the 2018 baseline environmental setting as it relates to cultural resources. Therefore, the conditions described above for the existing environmental setting are also largely representative of the 2018 environmental baseline.

5.4.4 Regulatory Setting

Federal

Cultural resources are considered through the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. 306108), and its implementing regulations. Prior to implementing an "undertaking" (e.g., federal funding or issuing a federal permit), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register. Under the NHPA, a property is considered significant if it meets the National Register listing criteria at 36 Code of Federal Regulations (CFR) 60.4, as stated below:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

a) Are associated with events that have made a significant contribution to the broad patterns of our history, or

b) Are associated with the lives of persons significant in our past, or

c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

d) Have yielded, or may be likely to yield, information important in prehistory or history.

Federal review of projects is normally referred to as the Section 106 process. This process is the responsibility of the federal lead agency. The Section 106 review normally involves a four-step procedure, which is described in detail in the implementing regulations (36 CFR Part 800):

- Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties;
- Assess the effects of the undertaking on historic properties;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the ACHP; and finally,
- Proceed with the project according to the conditions of the agreement.

State

The State of California consults on implementation of the NHPA of 1966, as amended, and also oversees statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources System (CHRS) Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act (CEQA)

CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

CEQA requires lead agencies to determine if a proposed project would have a significant effect on important archaeological resources, either historical resources or unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Sections 21083.2 and 21084.1, and, CEQA Guidelines Sections 15064.5 and 15126.4 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then

the site may meet the threshold of PRC Section 21083 regarding unique archaeological resources. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC Section 21083.2 [g]).

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register, an historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria.

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2) Is associated with the lives of persons important in our past.
3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

California Public Resources Code (PRC) and Health and Safety Code

Several sections of the PRC protect cultural resources. Under PRC Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor. PRC Section 5097.98 states that if Native American remains are identified within a project area, the lead agency must work with the appropriate Native Americans as identified by the Native American Heritage Commission and develop a plan for the treatment or disposition of, with appropriate dignity, the human remains and any items associated with Native American burials. These procedures are also addressed in Section 15046.5 of the CEQA Guidelines. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

Title 14, Section 4307 of the California Code of Regulations (CCR) also prohibits any person from removing, inuring, defacing, or destroying any object of paleontological, archaeological, or historical interest or value.

Assembly Bill 52 (AB 52)

In September 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. AB 52 now requires lead agencies to analyze project impacts on "tribal cultural resources" separately from archaeological resources (PRC Section 21074; 21083.09). The bill added a definition of "tribal cultural resources" in a new PRC Section 21074, and added requirements for lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Section 21080.3.1, 21080.3.2, 21082.3).

Specifically, PRC Section 21084.3 states:

a. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.

b. If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

    1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

   A. Protecting the cultural character and integrity of the resource.

   B. Protecting the traditional use of the resource.

   C. Protecting the confidentiality of the resource.

3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

4) Protecting the resource.

Finally, as requirements under AB 52 the Governor's Office of Planning and Research (OPR) updated Appendix G of the CEQA Guidelines to provide sample questions regarding impacts to tribal cultural resources (PRC Section 21083.09).

County of Santa Clara

Santa Clara County Historical Heritage Commission (HHC) and Heritage Resource Inventory

The Santa Clara County HHC is responsible for overseeing the protection of historical resources throughout the unincorporated areas of the County. The Santa Clara County Heritage Resource Inventory (County Inventory) is the official listing of historic sites and is maintained by the Commission. The County Inventory was first published in 1979 and is updated as new sites are approved by the Santa Clara County Board of Supervisors. The County Inventory consists entirely of sites that have been listed, or determined to be eligible for listing, on the National Register and/or the California Register.

In addition to its responsibility for proposing additions to the County Inventory, the Santa Clara County HHC provides a recommendation to the County Planning Director regarding demolition of eligible resources listed on the County Inventory.

Santa Clara County General Plan

The Santa Clara County General Plan provides the goals and policies regarding heritage resources. Heritage resources are defined as resources, both natural and man-made, which due to their vulnerability or irreplaceable nature deserve special protection if they are to be preserved for current and future generations. Types of resources addressed as heritage resources include:

- historical sites, structures, and areas;
- archeological and paleontological sites and artifacts; and
- historical and specimen trees.

Goals

C-RC 49: Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values.

C-RC 50: Countywide, the general approach to heritage resource protection should include the following strategies:

1. Inventory and evaluate heritage resources.
2. Prevent or minimize adverse impacts on heritage resources.
3. Restore, enhance, and commemorate resources as appropriate.

C-RC 51: Inventories of heritage resources should be maintained as the basis for local decision making regarding such resources.

C-RC 52: Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources.

C-RC 54: Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource.

C-RC 55: Public awareness and appreciation of existing heritage resources and their significance should be enhanced through community organizations, neighborhood associations, the educational system, and governmental programs.

Stanford Community Plan

The Stanford Community Plan is an element of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

Resource Conservation

Heritage Resources

The Resource Conservation (RC) chapter of the plan contains several strategies and policies relevant to heritage resources:

Strategy #7: Inventory and Evaluate Heritage Resources

Policy SCP-RC 22 – Maintain informational databases and formal inventories of heritage resources as the basis for local decision-making regarding historic buildings, archaeological and paleontological sites, heritage trees, and landscape features.

Strategy #8: Protect Heritage Resources Through Avoidance, Adaptive Reuse, and Sensitive Planning and Design

Policy SCP-RC 23 – Protect heritage resources, including sites and structures, and trees in campus development through careful land use planning, individual project design, project review, use of appropriate guidelines, and other implementation measures.

Policy SCP-RC 24 – Protect the integrity of significant archaeological sites and other heritage resources. Ensure the confidentiality of archaeological site locations in conformance with state laws.

Policy SCP-RC 25 – Take into account the need to protect archaeological and paleontological resources in any environmental enhancement activities involving creek restoration and flood control.

Policy SCP-RC 26 – Give priority to the avoidance or adaptive reuse of historic structures over demolition whenever possible.

Architecture and Site Approval (ASA)

The County requires Stanford to apply for County Architecture and Site Approval (ASA) for individual projects under Stanford's 2000 General Use Permit. In December 2016, ASA functions were consolidated under the County Zoning Administrator. As part of the ASA process or other approvals, Stanford General Use Permit conditions must be met on each individual project that is approved under the General Use Permit, including any conditions regarding protection of cultural resources. The County maintains discretion to modify its approval/permitting procedures.

2000 General Use Permit

The 2000 General Use Permit includes several conditions of approval to ensure that the permitted development is consistent with the Stanford Community Plan policies for protection of cultural resources. Projects approved under the 2018 General Use Permit would be subject to the conditions of approval in the 2018 General Use Permit, not the conditions in the 2000 General Use Permit.

Historic Resources

The 2000 General Use Permit requires that, prior to County approval of a demolition permit for structures that are 50 years old or more, Stanford must submit to the County Planning Office an assessment regarding eligibility for listing on a federal, state, or local list of historic resources, or as a potential historic resource; if needed, prepare a site-specific analysis along with any feasible measures to minimize impacts; and referral to the Santa Clara County Historical Heritage Commission for its recommendation. For remodeling and alteration of structures included in the County Inventory, or determined by the County Planning Office to be eligible for listing or is a potential historic resource, Stanford must conduct the work following the Secretary of the Interior's Standards for the Treatment of Historic Properties (Secretary's Standards). For remodeling and alteration of structures that are 50 years old or more that are not included in the County Inventory, Stanford must submit to the County Planning Office an assessment if the structure appears eligible for inclusion in the County Inventory; if needed, submit the assessment to the Santa Clara County Historical Heritage Commission for review; and conduct the remodeling/alterations following the Secretary's Standards.

In addition, in 2014 the County of Santa Clara and Stanford developed a series of interpretations to assist in the implementation of the General Use Permit conditions. These interpretations included the following key provisions:

- A procedure for "stamping" construction documents to certify that the proposed project has been reviewed by a qualified professional and found consistent the Secretary of the Interior's Standards and Guidelines;
- A procedure for submitting a "statement of compatibility" prepared by a qualified professional for new construction within 75 feet of a historic property; and
- A clarification regarding review of interiors of historic properties that host public programs (museums, concert halls, athletic competition venues); the verification of consistency with the Standards and Guidelines would apply to alteration of primary interior spaces within these facilities.

Archaeological Resources

As a condition of the 2000 General Use Permit, Stanford prepared a map that is on file at the County Planning Office that shows the location of all known prehistoric and historic-period archaeological resources in the unincorporated Santa Clara County portion of Stanford lands.

The 2000 General Use Permit also requires that for proposed building projects sited on a mapped prehistoric archaeological site, further site-specific analysis must be conducted to determine whether a significant impact would occur, and site-specific mitigation be identified. Construction monitoring is required when ground-disturbing activities (greater than 12 inches in depth) take place in the immediate vicinity of known archaeological resources. In addition, if a previously unidentified historic-period or prehistoric archaeological resources is discovered during construction, work must cease, and a qualified archaeologist must assess the significance of the find and make mitigation recommendations. Finally, in the event that human skeletal remains are encountered, proper notification with the County Coroner is required, and if remains are Native American applicable contact with the California Native American Heritage Commission, County Coordinator of Indian affairs, and County Planning Office must occur.

Paleontological Resources

The 2000 General Use Permit requires that in the event that fossilized shell or bone is uncovered during any earth-disturbing operation, construction work in the immediate area of the find stops, the Campus Archaeologist and the County Building Inspector is notified. The Campus Archaeologist is then required to make recommendations for treatment of the find, and if a fossil find was confirmed, such find is recorded with the United States Geological Survey and curated in an appropriate repository.

5.4.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on cultural resources if it would:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or

d) Disturb any human remains, including those interred outside of dedicated cemeteries.

In addition, the Project would have a significant impact on tribal cultural resources if it would:

e) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe.

Approach to Analysis

Architectural Resources

Potential impacts on architectural resources are assessed by identifying any activities (either during construction or operations) that could affect resources that have been identified as historical resources for the purposes of CEQA. Once a resource has been identified as a CEQA historical resource, it then must be determined whether the impacts of the Project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of an historical resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historic resource would be materially impaired" (CEQA Guidelines Section 15064[b][1]). An historical resource is considered materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in the California Register (CEQA Guidelines Section 15064.5[b][2][A]).

Archaeological Resources

Archaeological resources can include historical resources according to Section 15064.5 as well as unique archaeological resources as defined in Section 21083.2(g). The significance of most prehistoric and historical archaeological sites is usually assessed under National Register and California Register Criteria D/4. These criteria stress the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Although it is less common, archaeological resources may also be assessed under California Register Criteria 1, 2, and/or 3. Archaeological resources may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions.

Impacts to unique archaeological resources or archaeological resources that qualify as historical resources are assessed pursuant to Section 21083.2 which states that the lead agency shall determine whether the Project may have a significant effect on archaeological resources. As with architectural resources above, whether the impacts of the Project would "cause a substantial adverse change in the significance" of the resource must be determined (CEQA Guidelines Section 15064.5[b]).

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. These laws are identified above in Section 4.3.2, Regulatory Framework. This analysis considers impacts on human remains including intentional disturbance, mutilation, or removal of interred human remains.

Tribal Cultural Resources

A tribal cultural resource is defined as a site feature, place, cultural landscape, sacred place or object, which is of cultural value to a tribe that is either on or eligible for the California Register or a local historic register, or the lead agency, at its discretion, chooses to treat the resource as a tribal cultural resource. Impacts to tribal cultural resources are assessed in consultation with affiliated Native American tribe in accordance with PRC Section 21080.3. This analysis considers whether the Project would cause damaging effects to any tribal cultural resource.

Paleontological Resources

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit.

Impact Evaluation

Construction and Operational Impacts

Most impacts to cultural and paleontological resources occur during the construction activities of a project, and there is less potential for project operations to affect such resources; therefore consideration of construction and operational impacts are combined in this analysis.

Impact 5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. (*Significant*)

The following impact discussion focuses on the built environment (architectural and structural resources). Potential impacts to archaeological resources, including archaeological resources that are potentially historical resources according to CEQA Guidelines Section 15064.5, are addressed under Impact 5.4-2, below.

As discussed in Environmental Setting above, the Santa Clara County Heritage Resource Inventory identifies 20 resources within the Project site, all but one of which are located within the Academic Growth Boundary. In addition, an Historic Resources report prepared in support of its 2018 General Use Permit application included a comprehensive survey and evaluation that identified 74 historic buildings, recorded as 50 historic properties (42 collegiate and eight non-collegiate properties), all within the Academic Growth Boundary of the Project site.

Under the proposed 2018 General Use Permit all new non-residential building and housing, as well as most infrastructure improvements, would be constructed on vacant land, infill sites and redevelopment sites within the Academic Growth Boundary. It is expected that both demolition and remodeling of certain existing structures may occur over the course of the Project. Demolition and remodeling of buildings could have direct, physical impacts to historic resources and infill development could alter the setting or surrounding environment of historic resources; both of these effects could result in significant impacts.

At this time no individual projects and locations are proposed for development under the proposed 2018 General Use Permit. Existing County policies (e.g., Stanford Community Plan policies for Heritage Resources) and regulatory mechanisms provide oversight at the County level to protect significant architectural resources within the Project site. Individual projects approved pursuant to the 2018 General Use Permit requiring a County building permit or other approval would be subject to conditions of approval that could include specific requirements to ensure preservation of historic properties within the Project site. These conditions could address the treatment for demolition, remodeling and/or alteration of potential historic structures within the Project site that are 50 years old or more, as well as infill development in proximity to these resources.

The General Use Permit does not apply to land uses that are permitted as of right; therefore, the General Use Permit conditions do not apply to single family and duplex housing located within the faculty and staff residential neighborhoods. In those neighborhoods, the County implements its historic preservation ordinance to address demolition and alteration of landmarks and other structures listed on the County Inventory.

Mitigation Measures 5.4-1(a)-(e) would provide a formal framework for conditions protecting historic resources in the proposed 2018 General Use Permit. The County policies and implementation of mitigation measures identified in this EIR provide a comprehensive approach to protect historic resources within the Project site, however they would not definitively prevent the potential for demolition or significant alteration of historic resources. While it is considered unlikely that Stanford would demolish any of its historic buildings and structures within the Project site under the proposed 2018 General Use Permit or alter them in a manner that does not comply with the Secretary of Interior standards, if such actions were to occur, they would result in a significant and unavoidable impact to historic resources. Pursuant to the established regulatory framework, the County would review these projects and prepare the appropriate project-specific CEQA environmental review, and if a significant impact were to be identified additional feasible mitigation for these individual projects may be identified at that time to avoid

or reduce the magnitude of the significant impact. The project-specific CEQA environmental review would include an evaluation of the feasibility of preserving the historic resource.[7]

Mitigation Measure 5.4-1(a): The Stanford University Historic Resources Survey dated April 2017 contains an evaluation of all buildings and structures located within the Stanford Community Plan's Academic Campus land use designation that were constructed prior to 1976. Prior to 2025, Stanford shall provide to the County Planning Office for the review and approval of the County Planning Director (or designated representative) an additional survey of structures built within the Academic Campus land use designation between 1976 and 1985 ("Survey Addendum"). At its discretion, the County Planning Office may require a peer review of the Survey Addendum by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.

Mitigation Measure 5.4-1(b): For any building project that involves demolition of an historical resource that is listed or has been identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review of the project. Consistent with the County's process the analysis of project impacts, alternatives and mitigation will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to approval.

Mitigation Measure 5.4-1(c): For any proposed building project that involves remodeling, alteration, or a potential physical effect on an historical resource that is listed or identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, Stanford shall meet the following requirements:

1) The proposed building project shall be consistent with the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1995) ("Secretary of Interior's Standards"). Stanford shall submit documentation to the County prepared by a qualified professional to demonstrate consistency of the proposed project with the Secretary of the Interior's Standards. If the work to be performed constitutes basic maintenance, repair or replacement, Stanford shall mark the project plans with text stating: "Exterior work is limited to replacement of deteriorated materials with in-kind materials that match the old. Project plans have been reviewed by [Name of Architect], who has determined the work would comply with the Secretary of Interior's Standards." If the work to be performed is more extensive than basic maintenance, repair or replacement in kind, Stanford shall submit a letter along with the project plans explaining the basis for the University Architect's Office determination that the work would comply with the Secretary of Interior's Standards. The County Planning Office will review the marked plans or letter, and may require additional documentation.

[7] Under the 2000 General Use Permit, Stanford demolished one historic building, Encina Gym. The County prepared a Supplement to the 2000 General Use Permit EIR to evaluate the impact to historic resources, identify mitigation measures, and consider alternatives. The building had been constructed from unreinforced masonry and therefore had been vacated and mothballed. The Supplement concluded that it was not feasible to seismically retrofit and reuse the building. After circulating the Supplement for public comment and presenting the findings to the Historical Heritage Commission, the County approved the demolition.

2) The requirement that the building project must be consistent with the Secretary of the Interior's Standards shall be primarily limited to alterations to the exterior. Building interiors will be exempt from such a consistency requirement, except for interior spaces that are open to the general public on an ongoing basis. Such buildings are listed below along with their public interior spaces.

Historic Resource	Primary public space(s) subject to review (if integrity present)	Secondary space(s): no review required
Cantor Center/ Stanford Museum	Lobby and galleries on first and second floors of 1891 and 1902 wings	Restrooms, staff offices, collection storage areas, all basement areas and all spaces in 1999 addition
Memorial Church	Main sanctuary, entry vestibule, organ and choir lofts	Restrooms, offices and store rooms, all basement areas
Art Gallery	Vestibule and gallery space	Restrooms, offices and store rooms, all basement areas
Hoover Tower	Lobby, galleries, observation platform	Restrooms, offices and store rooms, all basement areas
Memorial Hall	Lobby, Pigott Theater, Auditorium	Restrooms, offices and store rooms, radio station
Frost Amphitheater	Terraces, stage	Restrooms, store rooms
Burnham Pavilion/ Ford Center	Lobby, main gym	Restrooms, locker rooms, offices, store rooms; all spaces in 1990 addition

3) The County Planning Office may require a peer review of the Secretary of the Interior's Standards consistency analysis by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.

4) If it is not feasible for the building project to be consistent with the Secretary of Interior's Standards, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review. The analysis of impacts, alternatives and mitigation measures will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to County approval.

Mitigation Measure 5.4-1(d): For any building project that involves demolition, modification or significant alteration of a structure located outside of the Academic Campus land use designation that is 50 years old or more, Stanford may elect to follow the Secretary of Interior's Standards. If Stanford does not elect to follow the Secretary of Interior's Standards for such a project Stanford shall submit an assessment regarding its eligibility for listing on the California Register ("Eligibility Assessment") to the County Planning Office. If the County Planning Office determines that the building/structure is eligible for listing on the California Register, then Stanford shall comply with the provisions in Sections 2 and 3 above and the building/structure shall be treated as if it were identified as eligible for listing in the Stanford Historic Resources Survey or Addendum for purposes of those Sections. The County Planning Office may require a peer review of the Eligibility Assessment by a qualified professional (Architect or Architectural Historian) at Stanford's expense.

Mitigation Measure 5.4-1(e): Proposed new buildings located within 75 feet of an historic resource that is identified as eligible for listing on the California Register in the

Stanford University Historic Resources Survey, Survey Addendum or Eligibility Assessment, measured from the nearest exterior walls, shall be reviewed by the University Architect to ensure that the design does not negatively impact the historic resources surrounding it. Stanford shall prepare design guidelines and submit a letter to the County Planning Office confirming that the new building construction has been reviewed by the University Architect's Office and is compatible with any historic resources located within 75 feet of the proposed new building. The County Planning Director (or designated representative) will review the letter prior to County approval of the new building. The County Planning Office may require a peer review of the University Architect's evaluation prior to approval of the building.

Significance after Mitigation: Significant and Unavoidable.

Impact 5.4-2: Project development could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Potentially Significant*)

As discussed in Environmental Setting, 23 prehistoric sites have been recorded in the Project site, of which one site is within the Academic Growth Boundary. While no individual projects and locations have been identified for development under the proposed 2018 General Use Permit, if Project-related construction were to occur within the boundaries of a recorded prehistoric archaeological site, a project-specific analysis would be required to determine whether the site constituted a unique archaeological resource according to PRC Section 21083.2 or a historical resource according to PRC Section 21084.1, and if so, whether the site would be adversely affected, thus resulting in a significant impact. In addition, it is possible that previously unknown prehistoric archaeological sites could be unearthed during excavation or earthmoving activities for an individual project under the proposed 2018 General Use Permit. This could result in a significant impact to a unique archaeological resource or a historical resource.

As discussed in Environmental Setting, 24 historic-period archaeological sites have been identified within the Project site; seven of the sites are located within the Academic Growth Boundary. It is possible that development under the proposed 2018 General Use Permit could adversely affect previously identified historic-period sites. If an historic-period site were determined to constitute a unique archaeological resource according to PRC Section 21083.2(g) or an historical resource according to PRC Section 21084.1, an adverse effect could be considered significant. In addition, it is possible that previously unknown historic-period archaeological sites could be unearthed during excavation or earthmoving activities associated with development under the proposed 2018 General Use Permit. This could result in a significant impact to a unique archaeological resource or historical resource.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant archaeological resources within the Project site. Individual projects approved pursuant to the 2018 General Use Permit requiring a County building permit or other County approval are subject to conditions of approval that include specific requirements addressing archaeological resources within the Project site. **Mitigation Measure 5.4-2(a)-(b)** would provide

a formal framework for conditions providing protection of archaeological resources in the proposed 2018 General Use Permit. Implementation of Mitigation Measure 5.4-2(a)-(b) would ensure that potential impacts to prehistoric and historic-period archaeological resources on the Project site would be reduced to a less-than-significant level.

> **Mitigation Measure 5.4-2(a):** Stanford has provided a map to the County Planning Office, maintained as a confidential record, that shows the location of all known prehistoric and historic archaeological resources in the unincorporated Santa Clara County portion of Stanford lands. Stanford shall conduct a Record Search at the Northwest Information Center of the California Historical Resources Information System and submit an updated map each year as part of the 2018 General Use Permit annual monitoring and compliance process. This annual update will be the basis for evaluating potential impacts of future projects that include ground disturbance.
>
> At the discretion of the County Planning Office, project-related archaeological site assessments and monitoring shall be conducted and mitigation measures identified by either the Stanford University Archaeologist or an independent archaeologist retained by the County at Stanford's expense. All archaeological reports (including, but not limited to, site assessments, monitoring reports, Archaeological Treatment Plans) shall be forwarded to the County Planning Office for review at Stanford's expense. All work shall be performed by, or under the supervision of, an archaeologist that meets the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).
>
> Significant impacts from projects on prehistoric and historic archaeological resources shall be addressed as specified below:
>
> 1. If a building project is proposed to be situated on a mapped archaeological site, a qualified archaeologist shall conduct further project-specific analysis to determine whether a significant impact would occur. If the site is determined to be eligible and cannot be avoided, an Archaeological Resources Treatment Plan shall be prepared and approved by the County Planning Office prior to the commencement of ground disturbing activities. If a Stanford archaeologist performs this work, the County may at its discretion require a peer review by an independent qualified archaeologist at Stanford's expense. Project-specific mitigation, if necessary, shall be identified in accordance with the provisions of Section 21083.2 of the Public Resources Code.
>
> 2. In the event that previously unidentified historic or prehistoric archaeological resources are discovered during construction, the contractor shall cease work in the immediate area and the County Planning Office and University Archaeologist shall be contacted immediately. The University Archaeologist shall provide and implement a proposed Archaeological Resources Treatment Plan. At the discretion of the County Planning Director (or designated representative) an independent qualified archaeologist may be retained by the County at the expense of Stanford to assess the significance of the find and the adequacy of the proposed Archaeological Resources Treatment Plan.
>
> 3. Archaeological monitoring shall be conducted at any time construction-related ground-disturbing activities (greater than 12 inches in depth) are taking place within 100 feet of known archaeological resources. A technical report including the results of all monitoring activities shall be prepared once monitoring is completed in

accordance with professional standards and submitted to the University Archaeologist. The archaeological monitoring shall be conducted or supervised by an individual meeting the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).

Mitigation Measure 5.4-2(b): In the event that human skeletal remains are encountered, Stanford is required by County Ordinance No. B6-18 to immediately notify the County Coroner. Work shall immediately stop within a 100-foot radius of the find. If the County Coroner determines that the remains are Native American, the coroner shall contact the California Native American Heritage Commission, pursuant to Health and Safety Code Section 7050.5(c), and the County Coordinator of Indian affairs. No further disturbance of the site may be made except as authorized by the County Coroner. If artifacts are found in association with the human skeletal remains no further disturbance of the artifacts may be made until authorized by the County Planning Office. It is the responsibility of Stanford to provide for reburial of the human skeletal remains and associated artifacts following completion of the required Native American consultation process described Health and Safety Code section 7050.5 (c) ; Stanford will file a State Record Form (DPR Series) documenting the reburial location with the California Historical Resources Information System and provide the location on the updated map provided for in Section 3 above.

Significance after Mitigation: Less than Significant.

Impact 5.4-3: Project development could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Potentially Significant*)

As discussed in Environmental Setting, in general, Stanford lands have a high potential to contain paleontological resources. Numerous discoveries have been made in the vicinity of the Project site, including a fossil find (bison humerus) recovered from an excavation at the site of the Stanford University Medical Center. It is possible that excavation related to construction of development on the Project site under the proposed 2018 General Use Permit would uncover additional paleontological resources, and this impact is therefore considered significant.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant paleontological resources within the Project site. Individual projects approved pursuant to the 2018 General Use Permit requiring a County building permit or other County approval are subject to conditions of approval that include specific requirements addressing paleontological resources within the Project site. **Mitigation Measure 5.4-3** provides a formal framework for conditions providing protection of paleontological resources in the proposed 2018 General Use Permit. Implementation of Mitigation Measure 5.4-3 would ensure that potential impacts to prehistoric and historic-period paleontological resources on the Project site under the proposed 2018 General Use Permit would be reduced to a less-than-significant level.

Mitigation Measure 5.4-3: In the event that potentially significant fossilized shell or bone is uncovered during any earth-disturbing operation, contractors shall stop work within 100 feet of the find and notify the University Archaeologist and the County Building Inspector assigned to the project. The University Archaeologist shall visit the

site and make recommendations for treatment of the find (including but not limited to consultation with a paleontologist and excavation, if warranted), which shall be sent to the County Building Inspection Office and the County Planning Office. If a fossil find is confirmed, it will be recorded with the United States Geological Survey and curated in an appropriate repository.

Significance after Mitigation: Less than Significant.

Impact 5.4-4: Project Development could disturb human remains, including those interred outside of dedicated cemeteries. (*Potentially Significant*)

Prehistoric archaeological resources may contain human burials. Although unlikely, there is the possibility that human remains, including those interred outside of dedicated cemeteries, could be encountered during ground-disturbing activities associated with new development under the 2018 General Use Permit. This impact is therefore considered significant.

In the event that human skeletal remains are discovered during construction, **Mitigation Measure 5.4-2(b)**, described under Impact 5.4-2, above, requires the contractor to cease work within 100 feet and notify the County coroner. If the coroner determines that the bones are Native American, the coroner shall contact the California Native American Heritage Commission.

Implementation of Mitigation Measure 5.4-2 would ensure potential impacts to human remains would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure 5.4-2(b).

Significance after Mitigation: Less than Significant.

Impact 5.4-5: Project development could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. (*Potentially Significant*)

In order to determine whether tribal cultural resources are located in the Project site, the County conducted Native American outreach. As discussed in the Environmental Setting, the Ohlone Tribe is traditionally and geographically associated with the Project site vicinity. On November 21, 2016, the County sent a letter to the Vice Chairperson of the Muwekma Ohlone Tribe (Tribe) that indicated it had received an application of the proposed 2018 General Use Permit Application from Stanford, and extended an opportunity to the Tribe to consult on the Project. On February 9, 2017, upon deeming the proposed 2018 General Use Application complete, the County sent a second letter to the Tribe similarly requesting consultation. The County did not receive a response from the Tribe.

On April 4, 2017 ESA submitted a Sacred Lands Files search request to the Native American Heritage Commission (NAHC) for any Native American cultural resources that may be within or adjacent to the Project site. On April 12, 2017 the NAHC responded that results of the Sacred Lands Files search was negative.

Based on the results of the NAHC Sacred Lands File search, there are no documented tribal cultural resources on the Project site. However, as discussed in Impact 5.4-2, above, there are numerous prehistoric archaeological sites on the Project site, many of which may be considered tribal cultural resources. Potential impacts to archaeological sites that are considered tribal cultural resources as a result of development under the proposed 2018 General Use Permit would be considered significant.

As discussed in Impact 5.4.2 above, **Mitigation Measure 5.4-2(a)** requires that if a project is proposed within 100 feet of the location of a recorded archaeological site, at the discretion of the County Planning Office, the Stanford University Archaeologist or an independent qualified archaeologist retained by the County at the expense of Stanford shall conduct further site-specific analysis to determine whether a significant impact would occur and to identify appropriate mitigation. In addition, Mitigation Measure 5.4-2 requires archaeological monitoring when construction-related ground-disturbing activities (greater than 12 inches in depth) would take place in the immediate vicinity of known archaeological resources.

Furthermore, in the event that a previously unidentified prehistoric archaeological resource is discovered during construction, Mitigation Measure 5.4-2(b) requires the contractor to cease work within 100 feet and contact the County Planning Office and University Archaeologist, and in the event that human skeletal remains are encountered, notify the County Coroner.

Implementation of Mitigation Measure 5.4-2 would ensure potential impacts to tribal cultural resources would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure 5.4-2(a)-(b).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources. (*Potentially Significant*)

The geographic scope for cumulative effects on historical resources includes unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and towns of Portola Valley and Woodside. The cumulative analysis combines all significant buildings and structures into a single, non-renewable resource base and considers the additive effect of potential project impacts to significant regional impacts

on these resources. A cumulatively considerable (significant) effect would occur if the project affected the same type of resource as one or more cumulative projects.

The potential impacts of the project when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on historic resources. Compliance with **Mitigation Measure 5.4-1(a)-(e)** would require a protocol for the identification and protection of historic buildings and structures within the Project site and would generally reduce impacts to these types of resources as a category to the extent feasible. Similarly, cumulative projects located outside of the Project site that involve historic resources, would be subject to applicable regulations and environmental review requirements of those jurisdictions. While these regulations, processes, and conditions reduce impacts to historic resources both on the Stanford lands and in Santa Clara County as a whole, demolition of historic resources would not be prohibited; therefore, the cumulative impact would be significant and unavoidable.

Mitigation: Implement Mitigation Measure 5.4-1(a)-(e).

Significance after Mitigation: Significant and Unavoidable.

Impact 5.4-7: Ground-disturbing activities undertaken as part of the Project could cumulatively cause a substantial adverse change in the significance of an archaeological resource, paleontological resource, or tribal cultural resource, or disturb human remains during construction. (*Potentially Significant*)

The geographic scope for cumulative effects on cultural and paleontological resources includes the unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and the towns of Portola Valley and Woodside. The cumulative analysis combines archaeological resources, paleontological resources, tribal cultural resources, and human remains into a single, non-renewable resource base and considers the additive effect of potential project impacts to significant regional impacts on cultural resources. A cumulatively considerable effect would occur if the Project affected the same type of resource as one or more cumulative projects.

Cumulative projects could have a significant impact on previously identified as well as undocumented archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries, given the amount of construction-related ground disturbance that could occur for many of the cumulative projects.

The potential impacts of the project when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on cultural resources. Project impacts to archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries would be mitigated to a less-than-significant level with compliance with **Mitigation Measure 5.4-2(a)-(b)** and

Mitigation Measure 5.4-3 would require implementation of protocol to follow in the event of a discovery and the appropriate treatment of human remains as well as site-specific studies and monitoring in locations of previously recorded sites. Similarly, cumulative projects located outside of the Project site that involve archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries, would be subject to applicable regulations and environmental review requirements of those jurisdictions. Therefore, with implementation of Mitigation Measure 5.4-2 and Mitigation Measure 5.4-3, the 2018 General Use Permit's contribution to cumulative impacts would not be considerable, and the impact would be less than significant.

Mitigation: Implement Mitigation Measure 5.4-2(a)-(b) and Mitigation Measure 5.4-3.

Significance after Mitigation: Less than Significant.

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5.5 Energy Conservation

5.5.1 Introduction

Section 21100(b) of the California Public Resources Code (PRC) directs all State Agencies, Boards and Commissions to assess the environmental impacts of projects for which they are a Lead Agency under CEQA to determine whether the Project could result in significant effect on the environment, including effects from the wasteful, inefficient, and unnecessary consumption of energy, and to identify mitigation measures to minimize any such significant effects. The goal of this assessment is to ensure the wise and efficient use of energy, which could be accomplished by a number of means, including decreasing overall per capita energy consumption; decreasing reliance on fossil fuels such as coals, natural gas, and oil; and increasing reliance on renewable energy sources.

This section presents an overview of energy service and consumption under the existing and 2018 environmental settings, and a discussion of applicable federal, State, and regional energy regulations. This section also estimates energy use with buildout of the proposed 2018 General Use Permit, and evaluates the potential energy impacts of the proposed Project with particular emphasis on avoiding or reducing inefficient, wasteful, or unnecessary consumption of energy. The section relies in part on (1) an Energy Technical Report prepared by Stanford in support of the proposed 2018 General Use Permit application (see Appendix ENE), which was independently peer reviewed by ESA, and (2) a Vehicle Miles Traveled (VMT) Analysis (Appendix VMT), which was independently peer reviewed by ESA and AECOM.

5.5.2 Existing Environmental Setting

Study Area

As explained in Chapter 3, Project Description, the proposed 2018 General Use Permit governs the entire Project site, however, it would not apply to development that is permitted by right under the County Zoning Ordinance. The single-family and two-family residences in the faculty/staff subdivision are permitted as of right, and therefore are not included in the study area within which Project energy use is analyzed. In addition, under the 2018 General Use Permit Stanford does not propose development in areas zoned for medium-density faculty and staff housing (the Peter Coutts, Pearce Mitchell, and the Olmsted Terrace housing areas); or within any areas that are outside the Academic Growth Boundary. Therefore, these areas similarly are not included within the study area for Project energy use.

The study area for Project energy use includes all areas of the Project site that would be subject to the proposed 2018 General Use Permit and designated as Academic Campus and Campus Open Space in the Stanford Community Plan.

Energy Profile

Among the states, California had the 48th lowest per capita energy consumption rate in the United States in 2013, with a yearly per capita consumption rate of 200 million British Thermal Units (MMBTUs). The transportation sector is the largest energy consumer in California, at nearly 38 percent of total energy consumption, with more registered vehicles than any other state and among the longest work commute times in the nation. Residential uses account for just over 19 percent of total energy consumption, commercial uses consume about 18.5 percent, and industrial uses consume about 24 percent (EIA, 2015).

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Approximately 68 percent of the electrical power needed to meet California's demand is produced in the state; the balance, approximately 32 percent, is imported from the Pacific Northwest and the Southwest (CEC, 2016b). In 2014, California's in-state electricity was derived from natural gas (45 percent), coal (6 percent), large hydroelectric resources (6 percent), nuclear sources (9 percent), and renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (20 percent) (CEC, 2016b). In 2014, California ranked fourth in the nation in conventional hydroelectric generation, second in net electricity generation from other renewable energy resources, and first in electricity production from both solar and geothermal energy.

Natural gas supplies the largest portion of California's electricity market; natural gas-fired power plants in California meet approximately 32 percent of the in-state electricity demand (U.S. EIA, 2016). In addition to the generation of electricity, natural gas is also widely used for industrial, commercial, and residential heating. Most of the natural gas consumed in California comes from the Southwest, the Rocky Mountains, and Canada, while the remainder is produced in California. Although contractually California can receive natural gas from any producing region in North America, it can only take supplies from the three producing regions due to the current configuration of gas transmission pipelines.

Energy Service Providers

In Santa Clara County, Pacific Gas & Electric (PG&E) is the primary supplier of electricity and natural gas to businesses and residents. PG&E's service area extends from Eureka to Bakersfield (north to south), and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E obtains its energy supplies from power plants, natural gas fields, and hydroelectric facilities in northern California, and from electricity and natural gas purchased outside its service area and delivered through high-voltage transmission lines of the power grid and through gas pipelines.

Stanford purchases "direct access" electricity for the majority of its campus operations. This program allows for a choice of energy providers rather than solely purchasing electricity from PG&E, although PG&E continues to deliver the electricity. Stanford's current direct access provider is Calpine, which provides 98 percent of all on-campus electricity. Previously, campus electricity was also generated by the Stanford's cogeneration plant, which was replaced with a more efficient Central Energy Facility (CEF) in 2015. In January 2017, Stanford commenced operation of the Stanford Solar Generating Station in Kern County. This facility provides half of

campus electricity by renewable sources (Stanford, 2015). While Stanford does not transport and use the energy generated at the Kern facility on the Project site, Stanford receives Renewable Energy Credits for the electricity it produces there.

Transportation Fuels

The energy consumed by the transportation sector accounts for roughly 41 percent of California's petroleum demand. Gasoline and diesel, both derived from petroleum (also known as crude oil), are the two most common fuels used for vehicular travel, although electricity is also rapidly approaching significance as a transportation fuel. According to the California Energy Commission (CEC), the State relies on petroleum-based fuels for 96 percent of its transportation needs. The transportation sector, including on-road and rail transportation (but excluding aviation), accounts for nearly 99 percent of all motor gasoline use, at roughly 3.4 million barrels in 2014 (EIA, 2016). As a whole, California is the third largest consumer of gasoline in the world, behind the U.S. and China (EIA, 2010). Approximately 37 percent of California's crude oil is produced within the State, about 12 percent is produced in Alaska, and the remaining 51 percent is produced in foreign countries.[1]

In 2013, approximately 14.54 billion gallons of gasoline were consumed in California, along with approximately 3.48 billion gallons of diesel fuel (CEC, 2015). Base gasoline demand dropped by about 13 percent between 2003 and 2013. Over that time, ethanol became a larger component of the gasoline supply, due to California's Renewable Fuel Standard (RFS), with an increase of 148 percent. In 2013, ethanol comprised 10 percent of each gallon of gasoline. Base diesel fuel demand remain unchanged between 2003 and 2013; however, biodiesel use increased due to the RFS and the Low Carbon Fuel Standard (LCFS). Diesel now accounts for approximately 5 percent of each diesel gallon.

Northern California refineries process approximately 45 percent of the State's crude oil and produce approximately 40 percent of the State's gasoline, and 49 percent of the diesel fuel, along with 34 percent of the jet fuel and 45 percent of the export fuel. Combined production capacity at the five Bay Area refinery centers was approximately 496,000 barrels per day (Western States Petroleum Association, 2008). A majority of gasoline, diesel and jet fuels produced at refineries are shipped by pipeline to over 60 distribution terminals. From there, tanker trucks transport fuels to retail and non-retail stations for direct consumer purchases. Truck deliveries to retail and non-retail stations statewide totaled nearly 5,000 trucks/day for gasoline and 1,200 trucks/day for diesel.

California experienced an approximate 5 percent decrease in production between 2007 and 2015 as a result of several factors, including declining fuel reserves and economic and regulatory factors (California State Board of Equalization, 2016a). Statewide, Californians used approximately 2.8 billion gallons of diesel and 14.9 billion gallons of gasoline in 2015 (California State Board of Equalization, 2016a and 2016b). Per capita consumption of petroleum products in

[1] In-state, other domestic, and foreign crude oil source information is from the U.S. Energy Information Administration, "Company Level Imports," cited in the CEC presentation of March 26, 2015.

transportation is expected to slow down with the increasing use of alternative fuels and improved fuel efficiency in vehicles.

Energy Consumption

Electricity and Natural Gas Consumption

Californians consumed nearly 283,000 gigawatt hours (GWh) of electricity in 2015, the most recent year for which data is available. Of this total, Santa Clara County consumed approximately 16,800 GWh. Californians consumed approximately 10,000 million therms of natural gas in 2015. Of this total, Santa Clara County consumed 411 million therms of natural gas (CEC, 2016a).

Transportation Sector Fuels Consumption

The transportation sector is a major end use of energy in California, accounting for approximately 39 percent of total statewide energy consumption in 2014 (USIA, 2016). In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 16 billion gallons of gasoline and more than 3 billion gallons of diesel each year, making California the second largest consumer of gasoline in the world (CEC, 2016b).

5.5.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020. Since the EV Graduate Residences are not expected to be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline.

The Energy Technical Report (see Appendix ENE), estimated the energy consumption in the study area for the 2018 environmental baseline condition, including from electricity use, natural gas combustion, mobile sources, emergency generators, construction emissions and other miscellaneous sources. **Table 5.5-1** summarizes the 2018 baseline energy consumption in the study area.

A comparison of the energy demand inventories for years 2014 and 2015 to that of the 2018 environmental baseline shows a general trend in decreased energy consumption for the Project study area between 2014 and 2018. This is due to several factors. Mobile sources will have lower

TABLE 5.5-1
2018 BASELINE ENERGY CONSUMPTION

Energy Sector	Energy Demand in Source Units	Energy Demand in MMBtu
Electricity	320,952 Mwh	1,095,088
Natural Gas	577,799 MMBtu	577,799
Mobile Gasoline Consumption	5,433,619 gallons gasoline	673,768
Mobile Diesel Consumption	456,762 gallons diesel	63,490
Stationary Fuel Consumption	36,271 gallons diesel	5,042
Construction Activities	37,700 gallons diesel	5,240
Total		2,420,428

NOTES:
Mwh = Megawatt hours
MMBtu = million British Thermal Units

SOURCE: Ramboll Environ, 2017

fuel use in 2018 based on ongoing improvements in the vehicle fleet as old vehicles are replaced with newer, more efficient vehicles, and existing regulatory standards that are resulting in increased fuel efficiency. In addition, changes to Stanford's energy systems have occurred since 2014 that have resulted in substantially increased energy efficiency. In 2015, Stanford completed an overhaul of its campus heating and cooling system, known as Stanford Energy System Innovations (SESI), which replaced Stanford's steam-based heating system with a hot-water based heating system, and replaced its cogeneration plant with a more efficient CEF. In addition, as explained above, Stanford procures electricity via a direct access program from the grid through Electricity Service Providers that include renewable resources within their portfolios. Additionally, Stanford offsets its electricity consumption through renewable energy generated by its Kern County Solar Generating Station and on-campus rooftop solar panels.

5.5.4 Regulatory Setting

Federal

National Energy Conservation Policy Act

The National Energy Conservation Policy Act (NECPA) serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it has been regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements. NECPA established energy-efficiency standards for consumer projects and includes a residential program for low-income weatherization assistance, grants and loan guarantees for energy conservation in schools and hospitals, and energy-efficiency standards for new construction. Initiatives in these areas continue today.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current

demand on these resources. For example, under the act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), signed in 2009.

Energy and Independence Security Act of 2007 and Corporate Average Fuel Economy Standards

The Energy and Independence Security Act of 2007 sets federal energy management requirements in several areas, including energy reduction goals for federal buildings, facility management and benchmarking, performance and standards for new buildings and major renovations, high-performance buildings, energy savings performance contracts, metering, energy-efficient product procurement, and reduction in petroleum use, including by setting automobile efficiency standards, and increase in alternative fuel use. This act also amends portions of the National Energy Policy Conservation Act.

EPA and NHTSA Joint Rulemaking for Vehicle Standards

In April 2010, the EPA and NHTSA issued a final rulemaking establishing new federal greenhouse gas and fuel economy standards for model years 2012 to 2016 passenger cars, light-duty trucks, and medium-duty passenger vehicles. In addition, on August 9, 2011, the EPA and NHTSA finalized regulations to reduce GHGs and improve fuel efficiency of medium- and heavy-duty vehicles, including large pickup trucks and vans, semi-trucks, and all types and sizes of work trucks and buses.

In August 2016, the EPA and NHTSA adopted the next phase (Phase 2) of the fuel economy and GHG standards for medium- and heavy-duty trucks, which apply to vehicles with model year 2018 and later (U.S. EPA, 2016). In response to the USEPA's adoption of the Phase 2 standards, California Air Resources Board (ARB) staff plan to bring a proposed California Phase 2 program before its Board in 2017 (CARB, 2016).

State

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy by employing a range of measures.

State of California Integrated Energy Policy

In 2002, the Legislature passed Senate Bill 1389, which required the CEC to develop an integrated energy plan biannually for electricity, natural gas, and transportation fuels, for the California Energy Report. The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

An overarching goal of the IEPR is to achieve the statewide greenhouse gas reduction targets, while improving overall energy efficiency is the main focus. The IEPR is the State's chief program intended to provide a comprehensive statewide energy strategy to guide energy investments, energy-related regulatory efforts and greenhouse gas reduction measures. Strategies identified in the most recent, 2015 IEPR Update are summarized below.

Renewables Portfolio Standard

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to obtain at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009,the Governor continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. In April 2011, Governor Brown signed SB 2X, which legislated the prior Executive Order S-14-08 renewable standard. SB 350 further increases the RPS goals to 50 percent renewables by 2030.

In April 2015, Governor Brown issued Executive Order B-30-15, which established a greenhouse gas reduction target of 40 percent below 1990 levels by 2030. SB 350 (Chapter 547, Statutes of 2015) advanced these goals through two measures. First, the law increases the renewable power goal from 33 percent renewables by 2020 to 50 percent by 2030. Second, the law requires the CEC to establish annual targets to double energy efficiency in buildings by 2030. The law also requires the California Public Utilities Commission (CPUC) to direct electric utilities to establish annual efficiency targets and implement demand-reduction measures to achieve this goal.

Energy Efficiency

Over the years, California has established a wide variety of laws and regulations that seek to improve the energy efficiency of existing and new buildings, the transportation sector, and goods and services. Some of those most relevant to the proposed 2018 General Use Permit are described below.

Existing Buildings Energy Efficiency

Commercial and residential buildings account for nearly 70 percent of California's electricity consumption and 55 percent of the state's natural gas consumption. Assembly Bill 758 (Skinner, Chapter 470, Statutes of 2009) recognized the importance of reducing existing building energy demands to achieve state climate change concerns. Senate Bill 350 (De Leon, Chapter 547, Statues of 2015) established a goal to double energy savings in existing buildings by 2030 and to conduct regular monitoring and reporting to assure continued progress in meeting that goal. Doubling the rate of energy savings from existing building efficiency improvement projects would result in lower total building energy use in 2030 than in 2014, even with significant population and economic growth, and is equivalent to a 20 percent reduction in usage compared to projected 2030 levels.

Title 24 - California Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, and 2013 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher efficiency lighting, HVAC, and water heating systems. Additionally, some standards focused on larger energy saving concepts such as reducing loads at peak periods and seasons and improving the quality of such energy-saving installations.

Past updates to the Title 24 standards have proved very effective in reducing building energy use, with the 2013 update estimated to reduce energy consumption in residential buildings by 25percent and energy consumption in commercial buildings by 30 percent, relative to the 2008 standards (CEC, 2012). The CEC recently adopted another update in 2016, and these new standards became effective on January 1, 2017 (CEC, 2016b). The 2016 updates include additional high efficiency lighting requirements, high performance attic and walls, and higher efficiency water and space heaters. The 2016 standards are expected to reduce residential electricity consumption by 28 percent and non-residential electricity by 5 percent (CEC, 2015).

California Green Building Standards Code (CALGreen)

The 2016 California Green Building Standards Code, as specified in Title 24, Part 11 of the California Code of Regulations, commonly referred to as CalGreen Building Standards (CalGreen), establishes voluntary and mandatory standards to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The provisions of this code apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California.

Examples of CalGreen provisions include reducing indoor water use, moisture sensing irrigation systems for landscaped areas, construction waste diversion goals, and energy system inspections. CalGreen is periodically amended; the most recent 2016 standards became effective on January 1, 2017.

Zero Net Energy Homes

For newly constructed low-rise homes, the State is steadily moving toward implementing zero-net energy buildings, in which energy efficiency is part of an integrated solution to developing homes that generate as much energy as they consume. The CPUC has set a goal of achieving zero net energy (ZNE) performance for all new low-rise homes constructed in or after 2020, and for all new commercial buildings constructed in or after 2030. Outstanding issues remain, however, including needing to identify compliance pathways when on-site renewable generation is not feasible, and the appropriate role for natural gas in ZNE buildings. The primary challenge is to build a technical and regulatory foundation for orchestration of energy efficiency and all other feasible distributed and customer-sited clean energy resources.

Senate Bills 1078 and 107 and Executive Order S-14-08 and S-21-09

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009, the Governor continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the California Air Resources Board under its Assembly Bill (AB) 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020.

SB 350 – Clean Energy and Pollution Reduction Act of 2015

SB 350, known as the Clean Energy and Pollution Reduction Act of 2015 was enacted on October 7, 2015 and provides a new set of objectives in clean energy, clean air, and pollution reduction by 2030. The objectives include the following:

> To increase from 33 percent to 50 percent, the procurement of our electricity from renewable sources.
>
> To double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

AB 1007 (Pavley)-Alternative Fuel Standards

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the State Alternative Fuels Plan in partnership with the California Air Resources Board and in consultation with other state, federal, and local agencies. The final State Alternative Fuels Plan, published in December 2007, attempts to achieve an 80 percent reduction in GHGs

associated with personal transportation, even as California's population increases. Measures proposed that would reduce petroleum fuel use include:

1) Lowering the energy needed for personal transportation by tripling the energy efficiency of on-road vehicles by 2050 through:
    a) Conventional gas, diesel, and flexible fuel vehicles (FFVs) averaging more than 40 miles per gallon (mpg).
    b) Hybrid gas, diesel, and FFVs averaging almost 60 mpg.
    c) All electric and plug-in hybrid electric vehicles (PHEVs) averaging well over 100 mpg (on a greenhouse gas equivalents [GGE] basis) on the electricity cycle.
    d) Fuel cell vehicles (FCVs) averaging over 80 mpg (on a GGE basis).
2) Moderating growth in per capita driving, reducing today's average per capita driving miles by about 5 percent or back to 1990 levels.
3) Changing the energy sources for transportation fuels from the current 96 percent petroleum-based to approximately:
    a) 30 percent from gasoline and diesel from traditional petroleum sources or lower GHG emission fossil fuels such as natural gas.
    b) 30 percent from transportation biofuels.
    c) 40 percent from a mix of electricity and hydrogen.
4) Producing transportation biofuels, electricity, and hydrogen from renewable or very low carbon-emitting technologies that result in, on average, at least 80 percent lower life cycle GHG emissions than conventional fuels.
5) Encouraging more efficient land uses and greater use of mass transit, public transportation, and other means of moving goods and people.

County of Santa Clara

Santa Clara County General Plan

On August 25, 2015, the County of Santa Clara adopted a new Health Element for the Santa Clara County General Plan. The Health Element Section G, Air Quality and Climate Change, contains the following policies with regard to energy conservation:

Policy HE-G.10 – *Conservation.* Promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions.

Policy HE-G.11 – *Renewable Energy.* Encourage renewable energy, such as solar and wind turbines on commercial, industrial and residential buildings.

Policy HE-G.12 – *Energy Technologies*. Support regional and local initiatives that promote integrated building systems, distributed generation, demand response programs, smart grid infrastructure, energy storage and backup, and electric transportation infrastructure.

Policy HE-G.18 *– Energy and Resiliency in Homes***.** Promote energy retrofits and increase extreme heat resiliency for housing, particularly for lower income and vulnerable populations.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan and serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. With respect to Energy Resources, the Stanford Community Plan refers to the Santa Clara County General Plan.

Stanford

Stanford Energy and Climate Plan

Updated most recently in 2015, Stanford's Energy and Climate Plan addresses energy demand reductions from new buildings, existing buildings, and renewable energy supply. The goals of the Energy and Climate Plan are implemented by building design strategies, energy conservation in existing buildings through Stanford's Energy Retrofit Program, the Whole Building Energy Retrofit Program (WBERP), Energy Conservation Incentive Program (ECIP), and the Plug Load Energy Consumption Reduction program. Stanford's campus-wide energy demand has been further reduced through the recent replacement of its natural gas-powered cogeneration facility with the CEF, which is part of SESI, Stanford's new heating, cooling, and electricity system. (Stanford, 2015).

5.5.5 Impacts and Mitigation Measures

Significance Criteria

Appendix G of the CEQA Guidelines does not identify any potential significance criteria for the evaluation of impacts related to energy demand and conservation. Nevertheless, Appendix F of the CEQA Guidelines identifies six potential areas of environmental impacts associated with energy conservation. These include:

a) The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal;

b) The effects of the project on local and regional energy supplies and on requirements for additional capacity;

c) The effects of the project on peak and base period demands for electricity and other forms of energy;

d) The degree to which the project complies with existing energy standards;

e) The effects of the project on energy resources; and

f) The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

For purposes of this EIR, to reflect the intent of CEQA Guidelines Appendix F, the proposed Project would result in a significant impact on energy demand and conservation if it would:

a) Result in the inefficient or wasteful use of large amounts of electricity, natural gas, or fuel; or

b) Create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect.

Approach to Analysis

The energy impact analysis estimates the estimated energy demand under full buildout of the proposed 2018 General Use Permit in year 2035 and compares this estimate to the 2018 baseline energy demand. Each of the six potential impact areas identified in Appendix F of the CEQA Guidelines are assessed separately with respect to energy use under the proposed 2018 General Use Permit to determine overall significance of the proposed Project's energy impact.

Energy Calculation Methodology

Project operational energy consumption sources include electricity use, natural gas combustion, mobile sources, and emergency generators, construction emissions. Energy consumption would also occur from construction activities. These sources are described in greater detail, below (see also Appendix ENE).

Construction. The average annual energy consumption from construction activities under the proposed Project was based on actual construction and demolition square footage within the Project site from fiscal year 2001 through fiscal year 2015, and then projected forward from 2018 to 2035.

Electricity Use. Electrical power to the Project site is purchased through the direct access program, and delivered by PG&E. Operational electricity usage was scaled up to account for the increased academic and academic support uses and student housing development by 2035. Electricity consumption for these uses was conservatively assumed to scale linearly, assuming that the efficiency of new buildings would be equal to current buildings; in fact, it is reasonable to expect that future buildings will be more energy efficient than existing buildings due to requirements of current and expected future building codes. Electricity usage from the proposed 550 new faculty/staff homes were conservatively estimated based on the CalEEMod default for condo/townhouses built to 2008 Title 24 standards, and adjusted to an approximation of 2016 Title 24 standards. Electricity usage from the Escondido Village Graduate Residences, which will be occupied after 2018, was added to the inventory using the same methodology as the new faculty/staff homes except starting with the CalEEMod default for the mid-rise apartment land use. The additional increase in electricity consumption is also assumed to incorporate increases in electrical demand for charging electric vehicles.

Natural Gas Combustion. Natural gas consumption was scaled up to account for the increased academic and academic support uses and student housing development by 2035. As with electricity consumption discussed above, natural gas consumption for these uses was conservatively assumed to scale linearly, such that the efficiency of new buildings would be equal to current buildings.

Natural gas consumption from the proposed 550 new faculty/staff homes was also added to the inventory using the conservative 2008 Title 24 standards adjusted to an approximation of the 2016 Title 24 standards, similar to that used for the electricity emissions estimates.

Mobile Fuel. Fuel usage associated with on-road mobile sources would be generated from residents, workers, visitors, and delivery vehicles traveling to and from the various land use types at Stanford. Fuel usage was estimated using an average miles per gallon obtained from EMFAC2014 for the fleet mix corresponding to the vehicle category and fuel type. Vehicle trip generation and/or VMT data was based on information developed for the analysis presented in Section 5.15, Transportation and Traffic (also see Appendix VMT). Mobile fuel usage accounts for the proposed electrification of all of Stanford's Marguerite bus fleet and 70 percent of its Lands, Buildings and Real Estate (LBRE) and Bonair vehicle fleets by 2035.

Emergency Generators. Diesel fuel usage from emergency generators would be from diesel combustion resulting from their operation for testing and maintenance and for emergency operation. Emergency generator operational data was scaled up to account for the increase in academic and academic support uses in 2035.

Impact Evaluation

Construction and Operational Impacts

Impact 5.5-1: Project development would not result in the use of fuel, water, or energy in wasteful or inefficient manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Each of the six potential impact areas identified in Appendix F of the CEQA Guidelines are assessed with respect to energy use under the proposed 2018 General Use Permit:

Appendix F.1: Energy Requirements and Energy Use Efficiencies of the Proposed Project

As discussed under Energy Calculation Methodology, above, Project-related energy consumption would be associated with electricity and natural gas use for Project operations, fuel consumption for mobile sources and emergency generator use, as well as energy consumption for construction activities. **Table 5.5-2** presents the total energy demand in 2035 that would occur in the study area with implementation of the proposed 2018 General Use Permit, and the net change in energy demand as compared to the 2018 environmental baseline. Please see Appendix ENE for additional details on the derivation of these estimates.

As can be seen from Table 5.5-2, due to additional development and growth under the proposed Project demand for electricity and natural gas would increase as compared to the 2018 baseline. Table 5.5-2 also shows that demand for gasoline and diesel would decrease under the proposed Project as compared to the 2018 baseline; this is due to implementation of Stanford's alternative transportation programs, TDM program, and electric vehicle initiatives; as well as from reasonable assumptions about increasing fuel efficiency of vehicles based on established State and federal regulatory standards.

TABLE 5.5-2
NET CHANGE IN ENERGY CONSUMPTION UNDER THE 2018 GENERAL USE PERMIT

Energy Sector	Energy Demand in 2018 Baseline (MMBtu)	Total Energy Demand in 2035 with Buildout of the 2018 General Use Permit (MMBtu)	Net Change in Energy Demand (MMBtu)
Electricity	1,095,088	1,355,768	+260,680
Natural Gas	577,799	718,441	+140,642
Mobile Gasoline Consumption	673,769	528,237	-145,531
Mobile Diesel Consumption	63,490	22,687	-40,803
Stationary Fuel Consumption	5,042	6,157	+1,115
Construction Activities	5,240	5,240	0
Total	**2,420,428**	**2,636,531**	**+216,103**

NOTES:
MMBtu = million British Thermal Units

SOURCE: Ramboll Environ, 2017

Overall energy demand in 2035 with buildout of the 2018 General Use Permit is projected to increase approximately nine percent over the 2018 baseline. However, as shown in **Table 5.5-3**, the per capita energy demand under the proposed 2018 General Use Permit would decrease, indicative of an overall improvement in energy efficiency compared to existing conditions. The decrease in per capita energy demand under the 2018 General Use Permit demonstrates that energy use efficiencies would increase under the proposed Project, and resulting energy use from Project implementation would not be wasteful or unnecessary.

TABLE 5.5-3
NET CHANGE IN PER CAPITA ENERGY CONSUMPTION UNDER THE 2018 GENERAL USE PERMIT

Inventory Year	MMBtu Equivalents	Service Population	MMBtu/ Service Population
2018 Baseline	2,420,428	53,268	45.4
2035 with Buildout of the 2018 General Use Permit	2,636,531	68,781	38.3

NOTES:
MMBtu = million British Thermal Units

SOURCE: Ramboll Environ, 2017

Appendix F.2: The Effects of the Project on Local and Regional Energy Supplies and on Requirements for Additional Capacity

Impacts on the local and regional energy supply under the proposed 2018 General Use Permit would be efficient as a result of use of renewable energy, energy efficiency standards, and the continued operation of the Stanford's CEF and implementation of the SESI program.

Additionally, while Stanford's proposed electrification of all Marguerite buses and 70 percent of its LBRE and Bonair vehicle fleets by 2035 would result in a small increase in calculated total electricity usage, the incremental electricity increase would be more than offset by the associated decrease in diesel fuel consumption as shown in Table 5.5-2. In addition, continued operation of the Stanford Solar Generating Station in Kern County and on-campus rooftop solar panels would provide half of campus electricity by renewable sources.

Over 98 percent of Stanford's electrical demand that is not met by the Solar Generating Station and on-campus rooftop solar panels is provided by a direct access provider which Stanford has the discretion to change throughout implementation of the 2018 General use Permit. Electrical service providers including PG&E actively plan for anticipated increases in peak demand and actively plan to offset growth in peak demands by encouraging and deploying energy efficiency and conservation measures within their service area. Given that there are approximately 6,000 megawatts of pending power plant projects is the state (CEC, 2017b), the proposed Project's increase in electrical demand would not have a substantial impact on the local or regional electrical supplies or require additional capacity to be constructed.

As shown in Table 5.5-2, under the proposed Project the annual natural gas consumption in the study area in 2035 is estimated to increase by approximately 140,600 MMBtu over the 2018 baseline. However, the total natural gas consumption in 2035 under the proposed 2018 General Use Permit (approximately 718,400 MMBtu) would be about half of what it was in 2014 prior to implementation of Stanford's SESI (approximately 1,552,100 MMBtu). In comparison, it is projected that natural gas demand in California will decrease in 2030 to 2.23 trillion Btu/yr (CEC, 2015b). Stanford's natural gas consumption accounts for less than 0.05 percent of the projected statewide annual consumption. Ninety percent of the State's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins (CEC, 2015). The United States produces 20 trillion cubic feet per year and had 340 trillion cubic feet of proven reserves in 2014 (USIA, 2016c). Stanford's natural gas consumption is not substantial in comparison to the national natural gas reserves and comprises only 0.003 percent of annual national natural gas production. Consequently, given the ample regional natural gas supplies available, the proposed Project would not have a significant impact on regional natural gas supply or require additional capacity to be constructed.

Gasoline and diesel are provided by California's transportation fuel supplier network. As shown in Table 5.2-2, implementation of the proposed 2018 General Use Permit would result in a reduction of gasoline and diesel demand compared to the 2018 baseline and thus the proposed Project would not adversely affect regional supply of these fuels. Overall, the proposed Project would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Appendix F.3: The Effects of the Project on Peak and Base Period Demands for Electricity and Other Forms of Energy

Stanford's SESI program was designed to increase its energy efficiency and allow the CEF to meet both peak and base demand for heating and cooling. Specific features of the new CEF allow for renewable or sustainable options for meeting peak demand. Thermal energy storage, for

example, allows for flexibility to run equipment at optimal load settings. Stanford's procurement of substantial amounts of renewable energy, including the new 68 MW off-site Kern County solar plant and the 4.9 MW of on-site rooftop solar panels, would help meet peak electricity demands on campus. Specifically, the off-site solar plant would meet Stanford's peak electricity demand of 48 MW. This generation of new renewable energy would reduce the strain on electricity production by reducing the demand for the grid resources, particularly during peak times when energy demand is the highest. Based on the availability of these resources, the proposed Project effects on peak and base period demands for electricity would not result in wasteful or inefficient use of energy, or require additional capacity to be constructed.

Appendix F.4: The Degree to which the Project Complies with Existing Energy Standards

During implementation of the proposed Project, Stanford would be required to adhere to applicable federal and State standards designed to minimize use of fuel in construction vehicles and ensure that buildings employ required energy efficiency techniques.

Stanford new building construction is subject to California's Title 24, which reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6). Provisions added over the years include consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, and lighting, as well as construction waste diversion goals. Additionally, some standards focus on larger energy saving concepts such as reducing loads at peak periods and seasons, improving the quality of energy-saving installations, and performing energy system inspections.

It should be noted that development projects under the 2000 General Use Permit have often exceeded Title 24 requirements in construction and operation of new buildings. For example, the high-performance design and construction of the Yang & Yamazaki Environment & Energy Building ("Y2E2"), constructed in 2008, utilizes 42 percent less energy than a traditional building of comparable size. Similarly, the Jen-Hsun Engineering Center and the Spilker Engineering and Applied Science Building, both constructed in 2010, as well as the Shriram Center for Bioengineering and Chemical Engineering, constructed in 2014, share many of the same design features and ambitious energy and water goals as the Y2E2 building. The William H. Neukom Building, constructed in 2011, uses 30 percent less energy and water than required by the code, and is a LEED-Gold equivalent project.

With respect to transportation energy, existing energy standards are promulgated either through the regulation of fuel refineries and products, such as the low carbon fuel standard, or through light-duty vehicle greenhouse gas emissions standards and corporate average fuel economy standards established by USEPA. Further, construction projects at Stanford would comply with State requirements designed to minimize idling and associated emissions, which also minimizes use of fuel. Specifically, idling of commercial vehicles and off-road equipment would be limited to five minutes in accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation.

Appendix F.5: The Effects of the Project on Energy Resources

See the discussion above under Appendix F.2: The Effects of the Project on Local and Regional Energy Supplies and on Requirements for Additional Capacity.

Appendix F.6: The Project's Projected Transportation Energy Use Requirements and its Overall Use of Efficient Transportation Alternatives

As described further in the analysis of VMT presented in Section 5.15, Transportation and Traffic, and in Appendix VMT, the per resident and per worker VMT generation under the proposed Project would be substantially lower than the regional and countywide averages. The VMT rates would be supported by Stanford's TDM program and the ability for residents to commute to work or class without using personal vehicles due to the density of public transit near and on the campus. In addition, on-campus housing for faculty and students would lower commuting VMT. Lower VMT results in lower mobile fuel use per worker and per resident than the regionwide and countywide average.

Stanford's existing alternative transportation programs have resulted in the percentage of sustainable commuters (commuters traveling in modes other than single occupancy vehicles) at Stanford to increase from 31 percent in 2002 to 51 percent in 2016 (SPTS, 2016). The use of transit passes, bicycling, rideshares, and other alternative modes of transportation, demonstrate the efficient use of transportation systems at Stanford.

The following list of TDM measures and commute options that are currently in-place represent a menu of the efficient transportation alternatives that would be utilized under the 2018 General Use Permit:

- **Marguerite Shuttle System:** Provides free transit through campus and connecting Stanford to public transit, a commuter train, shopping, dining, and entertainment. The fleet consists of 47 buses and shuttles running on biodiesel or as diesel-electric hybrid buses. Stanford plans to convert the entire fleet to electric buses by 2035.
- **Parking Program:** The high cost of parking at Stanford is a disincentive to commuting by single-occupancy vehicle to campus. Funds from the parking program help fund alternative transportation programs.
- **Transit Subsidies:** Stanford provides transit subsidies, such as the free Caltrain Go Pass (SPTS, 2017a). Stanford also purchases VTA Eco Passes for all eligible hospital and university employees to ride for free on VTA buses and light rail, the Dumbarton Express, the Highway 17 Express, and the Monterey-San Jose Express (SPTS, 2017b). Additionally, AC Transit runs a weekday express shuttle bus service between the East Bay and Stanford's campus, called Line U, which is free for Stanford faculty, staff, students, hospital employees, and SLAC employees (SPTS, 2017c). In addition, Stanford offers pre-tax payroll deduction for eligible employees to purchase transit passes, transit parking, and commuter checks.
- **Stanford Commute Club:** Stanford also has a Commute Club, which rewards sustainable commuters who agree not to drive alone to campus with up to $300 per year in Clean Air Cash or Carpool Credit, free daily parking passes and reserved parking spaces (carpools and vanpools), vanpool subsidies, emergency rides home, and free rental car vouchers and Zipcar driving credit.

- **Electric Vehicles:** As part of the 2018 General Use Permit, Stanford has committed to converting the entire Marguerite shuttle bus fleet, and 70 percent of its LBRE and Bonair on-campus vehicles, to electric vehicles by 2035. Stanford also provides on-site charging stations to support the expanded use of electric vehicles.

Conclusion

Overall energy demand in 2035 with buildout of the 2018 General Use Permit is projected to increase approximately nine percent over the 2018 baseline. However, as shown in Table 5.5-3, the per capita energy demand under the proposed 2018 General Use Permit would decrease, indicative of an overall improvement in energy efficiency compared to existing conditions. The decrease in per capita energy demand under the 2018 General Use Permit demonstrates that energy use efficiencies would increase under the proposed Project, and resulting energy use from Project implementation would not be wasteful or unnecessary. Further, the proposed Project would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Based on an evaluation of every issue identified in Appendix F, the proposed 2018 General Use Permit would not result in wasteful, inefficient or unnecessary consumption of fuel or energy, and would not create demand on local and regional energy supplies that would require additional energy generation or transmission capacity. This impact would be less than significant**.**

Mitigation: None required.

Cumulative Impacts

The cumulative impacts regarding the wasteful, inefficient, or unnecessary consumption of energy during construction would be the same as the project-specific context (Impact 5.5-1). Energy consumption effects related to individual projects are localized and would not combine with similar effects in other locations.

Impact 5.5-2: Project development, in conjunction with other cumulative development and growth, would not contribute to cumulative increases in demand for energy which would result in the use of large amounts of fuel, water, or energy, or use these in wasteful manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Electricity

Stanford is procuring the vast majority of electricity from Calpine through the direct access program. Calpine is one of many direct access electricity providers in the state and Stanford has the discretion to change providers over the implementation of the 2018 General Use Permit.

Continued growth throughout California's service areas could contribute to ongoing increases in demand for electricity. These anticipated increases would be countered, in part, by ongoing

increases in national, statewide, and local requirements and incentives to support construction or retrofit of buildings with increased energy efficiency. Overall state-wide electricity supply during most conditions is adequate. However, as demand continues to increase, temporary shortfalls could occur on portions of the statewide grid during temporary periods of high peak demand. Electricity providers such as Calpine and PG&E are actively planning for anticipated increases in peak demand through 2050. Given that California ranked first in electricity production from both solar and geothermal energy, and that there are approximately 6,000 megawatts of pending power plant projects is the state (CEC, 2017b), development under the 2018 General Use Permit would not constitute a cumulatively considerable impact on the primary regional electricity distributors or sources.

Natural Gas

With respect to natural gas, PG&E sources natural gas from a combination of producers and suppliers located in Canada and the U.S. Southwest. The utility maintains contracts with producers and suppliers over daily, monthly, and longer term agreements. PG&E also maintains gas storage facilities and a network of conveyance and distribution pipelines within its service area. In order to address future increases in demand, PG&E maintains an active planning process to identify and deploy additional conservation measures to minimize increases in demand, to secure continued natural gas supply, and to maintain sufficient distribution system capacity within its service area. The latest California Gas Report indicates that predicted demand for Northern California during a high demand wintertime scenario in 2035 of 2,463 MMCF per day will be 79 percent of available capacity (CGEU, 2016). With respect to the proposed Project, existing and planned infrastructure is anticipated to be sufficient to maintain service to the proposed project and other cumulative scenario projects. Therefore, cumulative scenario impact on natural gas supply would not be cumulatively considerable.

Transportation Fuel

The cumulative context of transportation fuels involves both construction activities, which is predominantly a demand for diesel fuel; as well as operational demand, which is predominantly a demand for gasoline. As discussed in the Environmental Setting, base gasoline demand dropped by about 13 percent between 2003 and 2013 and base diesel fuel demand remain unchanged between 2003 and 2013. Future statewide increases in gasoline demand associated with growth will likely continue to be offset by improvements to the vehicle fleet and programs such as low carbon fuel standard. As shown in Table 5.5-2, implementation of the proposed Project would result in a net decrease in gasoline and diesel demand. Consequently, the proposed Project would not have a cumulatively considerable contribution to the demand for transportation fuels.

Mitigation: None required.

5.5.6 References

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5.6 Geology and Soils

5.6.1 Introduction

This section presents the geologic and soils conditions on the Project site and region and addresses the potential for adverse effects related to geologic hazards and soils as a result of construction activities and campus operations under the 2018 General Use Permit. This section includes a description of the existing and 2018 environmental settings as it relates to geologic and soils conditions present in the region, including seismic hazards. A discussion of applicable federal, State, and County regulations pertaining to these proposed activities is also provided. This section addresses the potential for implementation of the proposed 2018 General Use Permit to create significant impacts by resulting in soil erosion, or exacerbating conditions related to unstable soils or slopes. The section then identifies regulatory mechanisms and/or potentially feasible mitigation measures, as necessary, to avoid or reduce the magnitude of significant impacts associated with geology and soils. This section also discusses exposure of people or structures to seismic hazards.

5.6.2 Existing Environmental Setting

Regional Setting

The Project site lies within the geologically complex region of California referred to as the Coast Ranges geomorphic province.[1] The Coast Ranges province is bordered by the Pacific Ocean and the Great Valley (Sacramento and San Joaquin valleys) province and extends from the Oregon border to the Santa Ynez Mountains near Santa Barbara. Much of the Coast Range province is composed of marine sedimentary deposits and volcanic rocks that form northwest trending mountain ridges and valleys, running subparallel to the San Andreas Fault Zone. West of the San Andreas Fault lies the Salinian Block, a granitic core that extends from the southern end of the province to north of the Farallon Islands. Movement along San Andreas, Hayward, and Calaveras faults and down warping between the faults contributed to the formation of Santa Clara Valley, a broad alluvial basin flanked by the Santa Cruz Mountains to the west and the Diablo Range to the east.

Project Setting

Geology and Soils

The Project site is located within the northwest corner of the Santa Clara Valley. Bedrock units including the Franciscan Complex, an unnamed shale, Whiskey Hill Formation, Butano Sandstone, Page Mill Basalt, Monterey Formation, Ladera Sandstone, Purisima Formation, Merced Formation, and Santa Clara Formation are found exposed in the sloping and higher elevation areas in the southwestern portion of the Palo Alto region (Cornerstone, 2017). Along the Santa Cruz Mountain range, drainages emerge and flow northeast/east towards San Francisco Bay and have deposited

[1] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces.

alluvial fan sediments along the way. Alluvial deposits can extend to depths ranging up to 700 feet in Santa Clara Valley.

The Project site straddles the boundary between the mountains and the contiguous alluvial plain but is primarily underlain by fine-grained natural levee deposits that were deposited within the last 11,000 years. The deposits generally consist of silt and clays. The deposits slope away to flatter flood plain and basin deposits northeast of the Stanford campus where they eventually interfinger with bay deposits, known as San Francisco Bay Mud, near the bay shoreline. The alluvial deposits overlie bedrock from the Franciscan Complex which is encountered at depths of more than 600 feet in the campus vicinity (Cornerstone, 2017). In the eastern portion of the Project site (Escondido Village), a recent boring did not encounter bedrock until a depth of approximately 897 feet below ground surface.

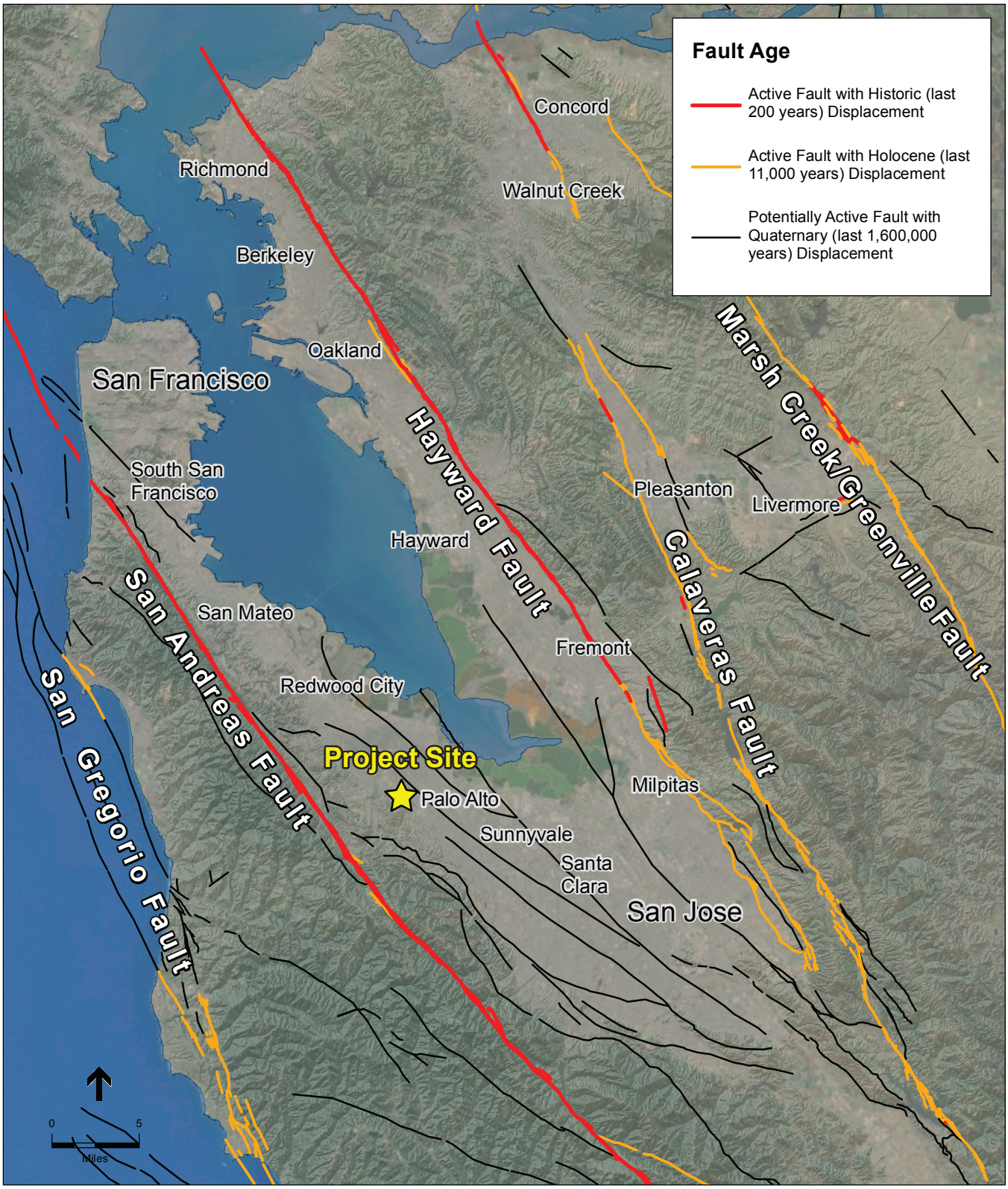
Faults and Seismicity

The Project site lies within a region of California that contains many active and potentially active faults and is considered an area of high seismic activity, as shown in **Figure 5.6-1** and described in **Table 5.6-1**. The U.S. Geological Survey (USGS) along with the California Geological Survey (CGS) and the Southern California Earthquake Center formed the Working Group on California Earthquake Probabilities (WGCEP) which has evaluated the probability of one or more earthquakes of magnitude 6.7 or higher occurring in the State of California over the next 30 years (beginning in 2014). The result of the most recent evaluation known as the Uniform California Earthquake Rupture Forecast (UCERF3) indicated a 72 percent likelihood that such an earthquake event will occur in the Bay Area region (USGS, 2015).

As discussed in more detail below, the Northern San Andreas, Hayward and Calaveras Faults are believed to pose the greatest threat of significant damage in the Bay Area according to the WGCEP (USGS, 2015). These three faults exhibit strike-slip orientation and have experienced movement within the last 150 years.[2] Other principal faults capable of producing significant ground shaking in the Bay Area are listed in Table 5.6-1 and include the Concord–Green Valley, Marsh Creek–Greenville, San Gregorio and Rodgers Creek Faults.

The San Andreas Fault Zone is a major structural feature that forms at the boundary between the North American and Pacific tectonic plates, extending from the Salton Sea in Southern California near the border with Mexico to north of Point Arena, where the fault trace extends out into the Pacific Ocean. The main trace of the San Andreas fault through the Bay Area trends northwest through the Santa Cruz Mountains and the eastern side of the San Francisco Peninsula. As the principal strike-slip boundary between the Pacific plate to the west and the North American plate to the east, the San Andreas is often a highly visible topographic feature, such as between Pacifica and San Mateo, where Crystal Springs Reservoir and San Andreas Lake clearly mark the rupture zone.

[2] A strike-slip fault is a fault on which movement is parallel to the fault's strike or lateral expression at the surface.



SOURCE: ESRI, USGS and CGS

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Figure 5.6-1
Regional Fault Map

TABLE 5.6-1
ACTIVE FAULTS IN THE PROJECT SITE VICINITY

Fault	Distance and Direction from Project Site	Recency of Movement	Fault Classification[a]	Historical Seismicity[b]	Maximum Moment Magnitude Earthquake (Mw)[c]
San Andreas	2 to 5 miles southwest	Historic (1906; 1989 ruptures)	Active	M 7.1, 1989 M 8.25, 1906 M 7.0, 1838 Many <M 6	7.9
Hayward	12 miles northeast	Historic (1868 rupture)	Active	M 6.8, 1868 Many <M 4.5	7.1
San Gregorio	18 miles southwest	Prehistoric (Sometime prior to 1775 but after 1270 A.D.)	Active	n/a	7.3
Calaveras	22 miles east	Historic (1861 1911, 1984)	Active	M 5.6–M 6.4,1861 M 6.2, 1911, 1984	6.8
Concord–Green Valley	40 miles northeast	Historic (1955)	Active	Historic active creep	6.7
Marsh Creek–Greenville	38 miles northeast	Historic (1980 rupture)	Active	M 5.6 1980	6.9
Rodgers Creek	55 miles north	Historic	Active	M 6.7, 1898 M 5.6, 5.7, 1969	7.0

[a] An "active" fault is defined by the State of California as a fault that has had surface displacement within approximately the last 11,000 years. A "potentially active" fault is defined as a fault that has shown evidence of surface displacement during the last 1.6 million years, unless direct geologic evidence demonstrates inactivity for the last 11,000 years or longer. This definition does not mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that displacement occurred in the last 11,000 years on one or more of its segments or branches. (Hart, 2007).

[b] Richter magnitude (M) and year for recent and/or large events. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.

[c] Moment Magnitude (Mw) is related to the physical size of a fault rupture and movement across a fault. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CGS, 2002b). The Maximum Moment Magnitude Earthquake, derived from the joint CGS/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996 (Peterson, 1996).

SOURCES: Hart, 2007; Jennings, 2010; Peterson, 1996; USGS, 2003.

In the San Francisco Bay Area, the San Andreas Fault Zone was the source of the two major seismic events in recent history that affected the San Francisco Bay region. The 1906 San Francisco earthquake was estimated at M 7.9 and resulted in approximately 290 miles of surface fault rupture, the longest of any known continental strike slip fault. Horizontal displacement along the fault approached 17 feet near the epicenter.[3] The 1906 event caused considerable damage to buildings on the Stanford University campus. The more recent 1989 Loma Prieta earthquake, with a magnitude of M 7.1 (Mw 6.9), resulted in widespread damage throughout the Bay Area. The epicenter of the Loma Prieta event was approximately 30 miles south of the Project site, but this earthquake nevertheless caused strong ground shaking for about 20 seconds and resulted in varying degrees of structural damage throughout the Bay Area. At Stanford, more than 200 campus structures were damaged during the Loma Prieta earthquake, and three buildings were vacated and later demolished.

[3] Earthquake magnitudes are often measured by their Moment Magnitude (Mw) which is related to the physical characteristics of a fault including the rigidity of the rock, the size of fault rupture, and movement or displacement across a fault (CGS, 2002b).

Hayward Fault

The Hayward Fault Zone is the southern extension of a fracture zone that includes the Rodgers Creek Fault (north of San Pablo Bay), the Healdsburg fault (Sonoma County), and the Maacama fault (Mendocino County). The Hayward fault trends to the northwest within the East Bay, extending from San Pablo Bay in Richmond, 60 miles south to San Jose. The Hayward fault in San Jose converges with the Calaveras fault, a similar type fault that extends north to Suisun Bay. The Hayward fault is designated by the Alquist-Priolo Earthquake Fault Zoning Act as an active fault.

The Hayward fault generated one sizable earthquake in the 1800s;[4] in 1868, a Richter magnitude 6.8 (i.e., M 6.8) earthquake on the southern segment of the Hayward Fault ruptured the ground for about 30 miles. Although large earthquakes on the Hayward fault have been rare since 1868, slow fault creep has continued to occur and has caused measurable offset. However, a large earthquake could occur on the Hayward fault with an estimated moment magnitude (Mw) of about Mw 7.1 (Table 5.6-1). The WGCEP includes the Hayward–Rodgers Creek Fault Systems in the list of those faults that have the highest probability of generating earthquakes of M 6.7 or greater in the Bay Area in the next 30 years beginning 2014 at a probability of 14.3 percent (USGS, 2015).

Calaveras Fault

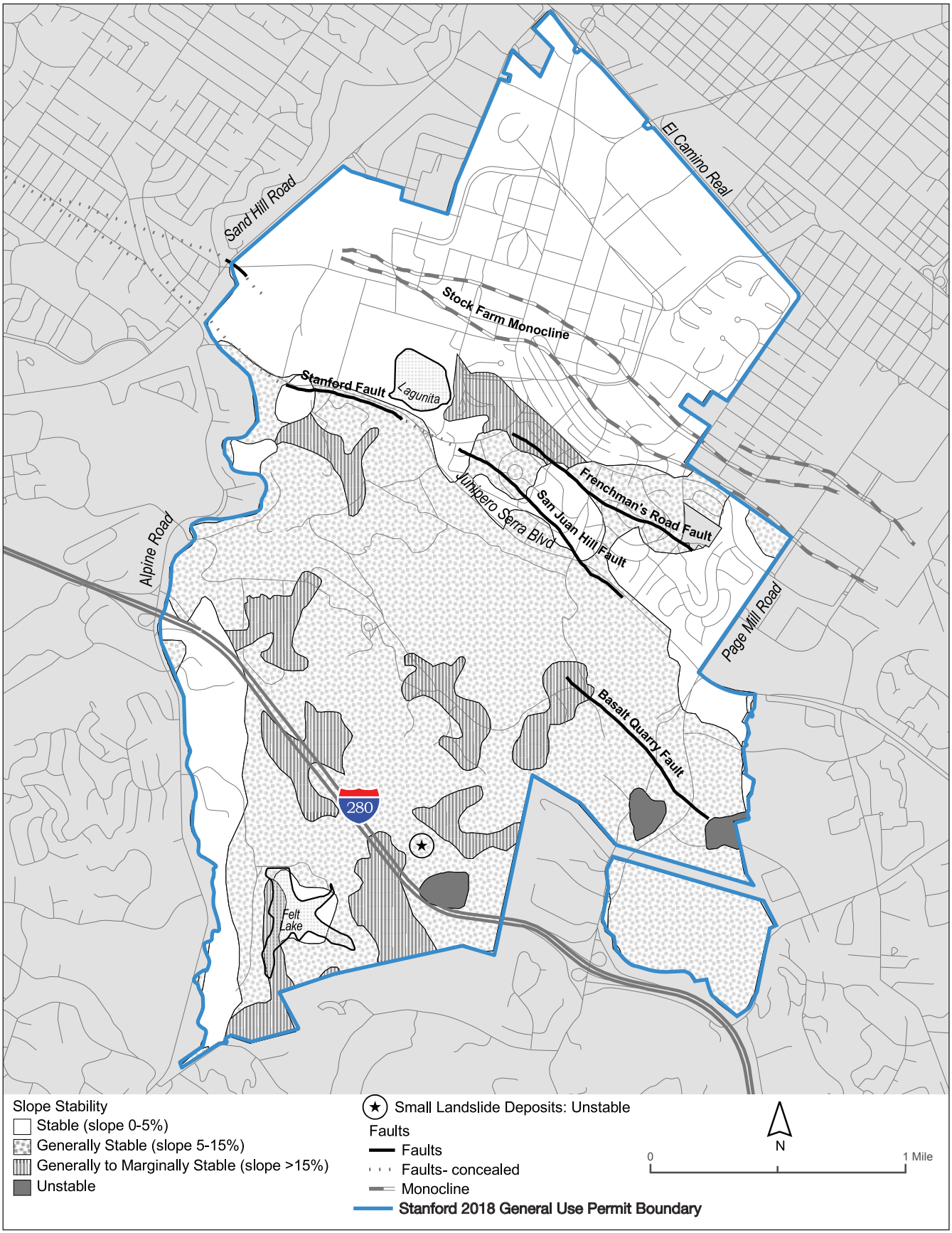
The Calaveras fault is a major strike-slip fault that has been active during the last 11,000 years. The Calaveras Fault is located in the eastern San Francisco Bay region and generally trends along the eastern side of the East Bay Hills, west of San Ramon Valley, and extends into the western Diablo Range, and eventually joins the San Andreas Fault Zone south of Hollister. The northern extent of the fault zone is somewhat conjectural and could be linked with the Concord Fault.

The Calaveras fault is designated as an Alquist-Priolo Earthquake Hazard Zone. The Calaveras Fault has been the source of numerous moderate magnitude earthquakes and the probability of a large earthquake (greater than M 6.7) has been estimated at 7.4 percent over the next 30 years (USGS, 2015). However, this fault is considered capable of generating earthquakes with upper bound magnitudes ranging from Mw magnitude 6.6 to magnitude 6.8.

Other Local Faults

Figure 5.6-2 illustrates the location of faults within the Project site, along with other geologic and soils characteristics. Faults mapped as transecting the Project site including the Stanford fault (also referred to as the Pulgas fault), and the Frenchman's Road, San Juan Hill, and Basalt Quarry faults. The Stanford fault is mapped with dashes indicating that it is not very well defined in most locations and is only known to have resulted in displacement sometime in the last 1.6 million years. As a result, this fault is not considered active. The Frenchman's Road, Basalt Quarry and San Juan Hill faults are all under 2.5 miles long and also not considered active.

[4] Prior to the early 1990s, it was thought that a Richter magnitude 7 earthquake occurred on the northern section of the Hayward Fault in 1836. However, a study of historical documents by the California Geological Survey concluded that the 1836 earthquake was not on the Hayward Fault (Bryant, 2000).



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SOURCE: Stanford LRBE LUEP, 2000

Figure 5.6-2
Project Site Geology

Other noted local faults in the vicinity of the Project site include the Monte Vista-Shannon, Berrocal, Deer Creek, Arastradero Thrust, and Hermit faults. The Monte Vista-Shannon fault is considered a late Quaternary fault, meaning the last displacement episode occurred sometime in the last 700,000 years. The slip rate for this 28 mile long fault is estimated at 0.2 to 1.0 millimeters per year (USGS, 2017). The Monte Vista-Shannon fault and the others mentioned here are also not considered active. Nonetheless, despite the fact that there has been no evidence of a seismic event on any of these faults in a relatively long time, it does not preclude the possibility of one occurring on any one of these faults or of experiencing what is known as sympathetic displacement. Santa Clara County has designated the Frenchman's Road fault and the San Juan Hill fault as fault rupture hazard zones (see Stock Farm Monocline discussed below) (Cornerstone, 2017). However, from a probability standpoint the major active faults described above (San Andreas, Hayward, and Calaveras) are considered to have a much higher potential for being a source of seismic activity in the region.

Stock Farm Monocline

The Stock Farm Monocline is a northwest-trending, northeast-facing folded structural feature of the Santa Clara Formation and younger bedrock units of the area. The monocline is expressed on the ground surface by a northeast-facing rise located between Page Mill Road and Campus Drive West (see Figure 5.6-2). This structural feature has been studied extensively and evaluated to be an active fold in the strata with an underlying blind thrust fault[5] that is believed to produce the folding.

Present-day activity is either lacking or is occurring at a negligible rate that eludes detection in existing improvements overlying the monocline. For example, existing structures and pavements that are 100 years old show no deformation related to the monocline. It is not clear, however, whether the monocline can cause earthquakes. Although no surface deformation was recorded on the monocline in the 1906 earthquake or 1989 Loma Prieta earthquake, it is regarded as capable of minor ground deformation during an earthquake on the San Andreas fault or on another fault concealed at depth beneath the Stanford campus (Cornerstone, 2017). Deformation that is associated with an earthquake at another location is known as "co-seismic" or sympathetic deformation.

In 1997, the County of Santa Clara developed a Stock Farm Monocline base map and design criteria for building projects located around the lower hinge of the monocline. This base map was the basis for the County's Geologic Hazard Zone, which extends for 50 feet on either side of the surface projection of the lower hinge of the monocline. In 2006, revised design criteria were developed for new construction located within the monocline boundary. Review of this criteria conducted in 2017 concluded the 2006 design criteria was still appropriate for future development (Cornerstone, 2017). (Please see Regulatory Setting for additional detail on regulatory controls.)

[5] A blind thrust fault is a fault found at depth which has no expression at the ground surface where displacement can be identified.

Seismic Hazards

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults, which are referenced in Table 5.6-1.

The Project site is not within an Alquist-Priolo Fault Rupture Hazard Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate project region (Hart, 2007). Therefore, the risk of ground rupture at the Project site is considered very low.

Ground Shaking

Strong ground shaking from earthquakes generated by active faults in the Bay Area is a significant hazard that could affect the Project site during the next 30 years. During the life of the proposed Project, the proposed improvements are likely to be subjected to at least one moderate to severe earthquake that could cause very strong ground shaking.

The severity of ground shaking at the Project site resulting from a specific earthquake would depend on the characteristics of the generating fault, distance to the energy source, the magnitude of the event, and the site-specific geologic conditions. Earthquakes on the active faults (listed in Table 5.6-1) are expected to produce a range of ground shaking intensities at the Project site.

Liquefaction

Liquefaction is the sudden temporary loss of shear strength in saturated, loose to medium-density granular sediments (typically sands and gravels) subjected to ground shaking. It generally occurs when forces from ground shaking increase the pressure of the water between the soil granules to a point equal to the pressure of the soil overburden. When this occurs, the soil liquefies and can move like a fluid. Liquefaction can cause foundation failure of buildings and other structures due to the reduction of foundation bearing strength. Lateral spreading is a consequence of liquefaction and is characterized by the horizontal movement (several feet up to tens of feet) of surface blocks of soil over a liquefied surface on slopes ranging between 0.3 and 3 percent.

The potential for liquefaction depends on the duration and intensity of earthquake shaking, particle size distribution of the soil, density of the soil, and elevation of the groundwater. In general, soils underlain by groundwater levels that are deeper than 50 feet below ground surface will not be susceptible to liquefaction regardless of sediment composition.

Based on mapping from the USGS and data compiled by the Association of Bay Area Governments (ABAG), the portions of the Project site designated as being moderately susceptible to liquefaction include portions or all of the Campus Center, West Campus, DAPER and Administrative, Arboretum, Quarry and San Juan Development Districts (ABAG, 2017a).

Differential Settlement

Earthquake shaking can produce compaction and densification of dry, uniformly graded, granular, and loose soil material. The amount of compaction across an area can vary due to differences in soil types, producing differential settlement. Artificial fill may also be susceptible to differential settlement. Differential settlement can affect existing and proposed foundations, slabs, and pavements and is dependent on site specific conditions.

Other Geologic Hazards

Expansive Soil

Expansive soils exhibit a "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may result over an extended period of time, usually as the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Typically, soils that exhibit expansive characteristics comprise the upper five feet of the surface. The effects of expansive soils could damage foundations of above-ground structures, paved roads and streets, and concrete slabs. Expansion and contraction of soils, depending on the season and the amount of surface water infiltration, could exert enough pressure on structures to result in cracking, settlement, and uplift.

Settlement

Settlement can occur from immediate consolidation, shrinkage of expansive soil, and liquefaction. Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period of time and is followed by secondary compression, which is a continued change in void ratio under the continued application of the load.

Soils tend to settle at different rates and by varying amounts depending on the load weight or changes in properties over an area, which is referred to as differential settlement. When new structures are located over areas of greatly differing geotechnical engineering properties, differential settlement can result in damages to foundations and utility connections.

Soil Erosion

Soil erosion is the process whereby soil materials are worn away and transported to another area either by wind or water. Rates of erosion can vary depending on the soil material and structure, soil placement, and human activity. Excessive soil erosion can eventually lead to damage of building foundations and other improvements. Erosion is most likely on sloped areas with exposed soil, especially when unnatural slopes are created by cut and fill activities. Soil erosion rates can therefore be higher during the construction phase. Typically, the soil erosion potential during construction is reduced by using modern construction practices; and once an area is graded and covered with concrete, structures, asphalt, or vegetation, and improved drainage, the soil erosion potential diminishes.

Landslides

Landslides are dependent on the slope and geology of an area as well as the amount of rainfall, excavation, and seismic activity. A landslide or slope failure is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. Steep slopes and downslope creep of surface materials characterize landslide-susceptible areas. Landslides can occur on slopes of 15 percent or less, however, the probability is greater on steeper slopes. Areas of the Project site are identified as highly susceptible to seismically induced landslides. Based on mapping conducted by the CGS in accordance with the State of California Seismic Hazard Zonation Program, and compiled by the ABAG, areas of the Project site identified as highly susceptible to seismically induced landslides are almost entirely limited to areas of steep slopes within the Foothills Development District (ABAG, 2017b).

Areas that are susceptible to slope instability on the Project site have also been delineated by the USGS and are shown in the Stanford Community Plan (Figure 5.6-2). As shown in Figure 5.6-2, the Community Plan designates the majority of areas within the Academic Growth Boundary as stable (slope 0-5 percent), with the exception of portions of the Lagunita and San Juan Development Districts, which are designated as generally stable (5-15 percent) to generally to marginally stable (slopes >15 percent). Areas of marginal stability and unstable slopes are located within the Foothills Development District.

Mineral Resources

Mineral resources of significance found and extracted in Santa Clara County include construction aggregate deposits and, to a lesser extent, salts derived from evaporation ponds at the edge of San Francisco Bay.

Portions of land in the San Juan and Lagunita Development Districts, and portions of open space land within the Foothills Development District, are designated as Mineral Resource Zone 3 (MRZ-3), defined by the California Geological Survey (CGS) as an area containing mineral deposits the significance of which cannot be evaluated from available data. The Project site is not identified, however, as an area of regionally significance aggregate resources (CDMG, 1996).

5.6.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

There are no substantive changes anticipated between the existing environmental setting described above and the 2018 baseline environmental setting as it relates to geology and soils. Therefore, the conditions described above for the existing environmental setting are also representative of the 2018 environmental baseline.

5.6.4 Regulatory Setting

Federal

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was enacted in 1977 to "reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program." To accomplish this, the Act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended in November 1990 to refine the description of agency responsibilities, program goals, and objectives.

NEHRP's mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research results. The NEHRP designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns it with several planning, coordinating, and reporting responsibilities. Programs under NEHRP help inform and guide planning and building code requirements such as emergency evacuation responsibilities and seismic code standards.

Occupational Safety and Health Administration (OSHA) Regulations

OSHA's Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

State

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable.

The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction.

The 2016 CBC is based on the 2015 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments, which are based on reference standards obtained from various technical committees and organizations such as the American Society of Civil Engineers (ASCE), the Structural Engineering Institute (SEI), the American Institute of Steel Construction (AISC), and the American Concrete Institute (ACI). ASCE Minimum Design Standards ASCE/SEI 7-16 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (e.g., flood, snow, wind, etc.) for inclusion into building codes.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, which are used to determine a Seismic Design Category (SDC) for a project as described in Chapter 16 of the CBC. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC in accordance with Chapter 16 of the CBC. Chapter 16, Section 1613 provides earthquake loading specifications for every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, which shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE/SEI 7-16.

Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803), excavation, grading, and fills (Section 1804), load-bearing of soils (1805), as well as foundations (Section 1808), shallow foundations (Section 1809), and deep foundations (Section 1810). Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. For Seismic Design Categories D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses mitigation measures to be considered in structural design, which may include ground stabilization, selecting appropriate foundation type and depths, selecting appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

Construction General Permit

The California Construction Storm Water Permit (Construction General Permit)[6], adopted by the State Water Resources Control Board (SWRCB), regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. The Construction General Permit authorizes the discharge of storm water to surface waters from construction activities. It prohibits the discharge of materials other than storm water and

6 *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities,* Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ, National Pollutant Discharge Elimination System No. CAS000002.

authorized non-storm water discharges and all discharges that contain a hazardous substance in excess of reportable quantities established at 40 CFR 117.3 or 40 CFR 302.4, unless a separate National Pollutant Discharge Elimination System (NPDES) Permit has been issued to regulate those discharges.

The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre do the following:

- Complete a Risk Assessment to determine pollution prevention requirements pursuant to the three Risk Levels established in the General Permit;
- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the Nation;
- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP), which specifies best management practices (BMPs) that will reduce pollution in storm water discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and
- Perform inspections and maintenance of all BMPs.

In order to obtain coverage under the NPDES Construction General Permit, the Legally Responsible Person must electronically file all permit registration documents with the SWRCB prior to the start of construction. Permit registration documents must include:

- Notice of Intent;
- Risk Assessment;
- Site Map;
- SWPPP;
- Annual Fee; and
- Signed Certification Statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

County of Santa Clara

The County requires Stanford to apply for various approvals for individual projects under Stanford's General Use Permit. In December 2016, ASA functions were consolidated under the County Zoning Administrator. As part of the County approval process for projects implementing the General Use Permit, the County requires Stanford to demonstrate compliance with all requirements of the California Building Code (CBC), the County Geologic Ordinance, the County Building Inspection Office, the Stock Farm Monocline Agreement (see below), and any other agreements defined during the term of the General Use Permit with regard to reduction of seismic risk associated with new or remodeled facilities on the campus. Stanford General Use Permit conditions must be met on each individual project that is approved under the General Use Permit.

Santa Clara County Geologic Ordinance

The Santa Clara County Geologic Ordinance (Sections C12-600 through C12-624) establishes minimum requirements for the geologic evaluation of land, based on proposed land uses and

geologic hazard zones. It further establishes procedures to enforce these requirements, including rules and regulations for the development of land which is on or adjacent to known potentially hazardous areas, or which has the potential to create or increase the risk of geologic hazard. The provisions of this ordinance also are intended to ensure that the County fulfills its duties under state law regarding geologic hazards, including the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act.

Stock Farm Monocline Agreement

As discussed in the Environmental Setting, the Stock Farm Monocline extends through the Project site between Page Mill Road and Campus Drive West. A zone of special consideration has been established by the Santa Clara County Geologist along the lower hinge of the monocline within the campus. The County has identified specific measures that must be taken to address ground movement from an earthquake for buildings located in the area of the monocline. **Figure 5.6-3** illustrates the Stock Farm Monocline and its seven zone classifications. Specific design criteria have been developed for vertical deformation (due to tilting) and horizontal shortening (due to folding) in each zone.

For projects within the Stock Farm Monocline zone, prior to issuance of a building permit, the County requires Stanford to have an Engineering Geologist review project plans, and the engineer of record must issue a letter that demonstrates the new building can accommodate the design movement in each zone. Typically designing for this movement is addressed by use of standard foundations.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The Stanford Community Plan contains one strategy and several policies relevant to geological hazards:

Health and Safety

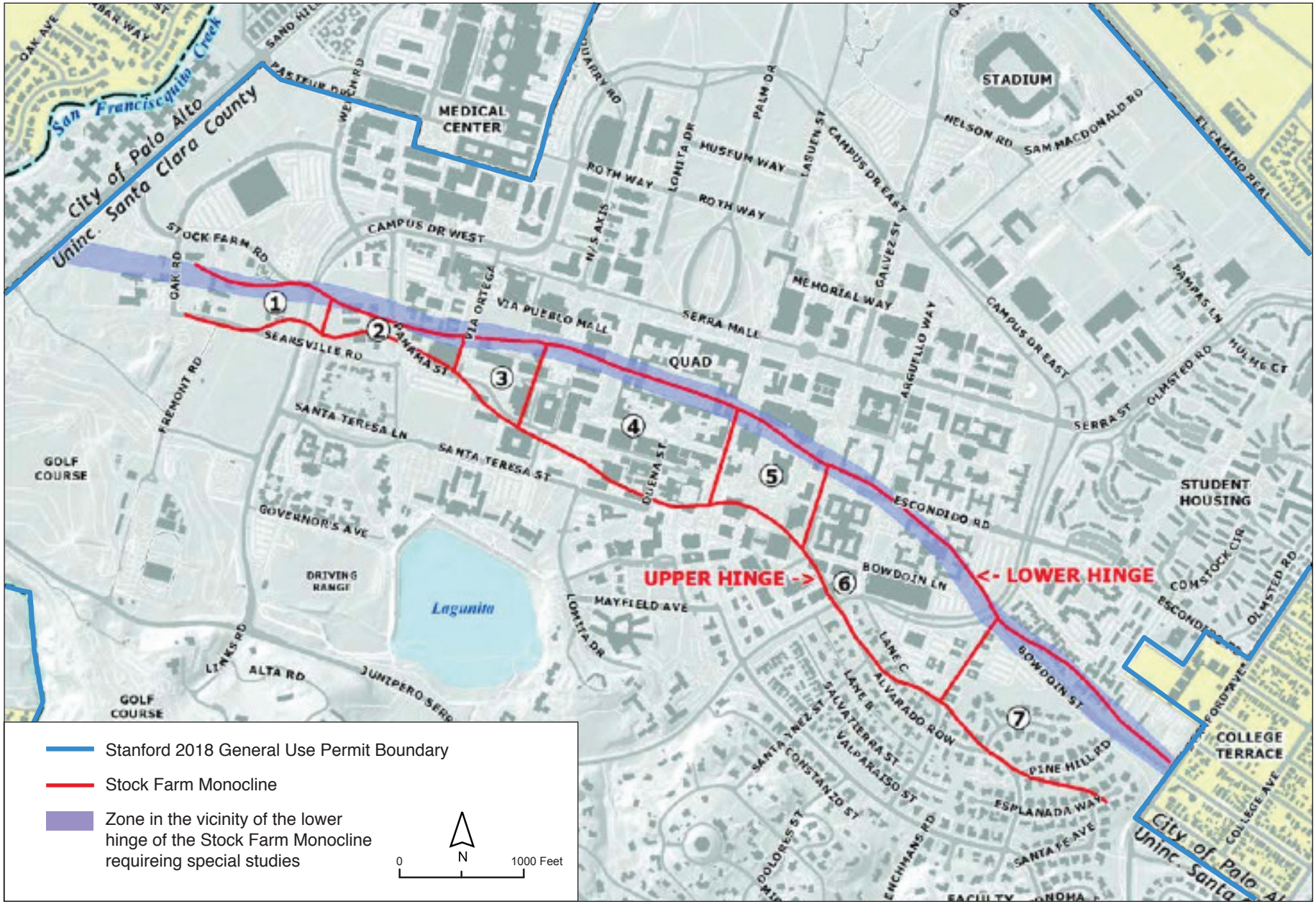
Geological Hazards

Strategy #4: Design, Locate, and Regulate Development to Avoid or Withstand Hazards.

Policy SCP-HS 6 – Avoid significant geologic hazard areas, such as unstable slopes, in locating new development. For projects proposed within areas of concern, provide geologic reports of investigations which quantify the risks and recommend mitigation measures. Such reports must be reviewed and approved by the County Geologist.

Policy SCP-HS 7 – Through the development review process, ensure compliance with all applicable County ordinances and other laws, regulations, and codes for seismic evaluation and the design of new and existing buildings and campus infrastructure.

Policy SCP-HS 8 – Designate such lands with significant geologic hazards Special Conservation Areas in the Community Plan Land Use map.



SOURCE: Dames and Moore, 1997; Santa Clara County, 2002

Figure 5.6-3
Stock Farm Monocline Zones

Stanford

Stanford Seismic Engineering Guidelines

The Stanford Seismic Engineering Guidelines were developed by its Land, Buildings and Real Estate Department (LBRE) in collaboration with Stanford's Seismic Advisory Committee (see discussion below). These guidelines are used in the design of new campus buildings and renovations. The guidelines set a facilities classification and related performance levels for Stanford buildings to address the risk reduction objectives related to protecting life safety and securing critical infrastructure and facilities. As part of Stanford's performance-based design approach, the guidelines incorporate the use of structural design peer review in the design process and through the finalization of construction documents, to ensure that the latest seismic engineering practices are addressed, that viable alternative options are explored, and that the design detailing is comprehensive and sound. Because codes and practices are continually evolving, the Stanford Seismic Engineering Guidelines are periodically updated (Stanford, 2013).

For the purpose of defining the level of design ground motion, Stanford has developed site-specific seismic criteria for different areas of the campus. As illustrated in **Figure 5.6-4**, portions of Stanford's core campus are divided into four zones (Zone 0, 1, 2 and 3), each with its own seismic design ground motions. The seismic design ground motions for each zone were developed following the standards of ASCE 7-05 Minimum Design Loads for Building and other Structures and ASCE 41-06 Seismic Rehabilitation of Existing Buildings, as well as Stanford's Seismic Engineering Guidelines (Stanford, 2013). In addition to the referenced codes and standards listed above, the latest edition of these and other referenced codes are used as appropriate for new campus construction and renovations at Stanford, including:

- ACI 318-08 Building Code Requirements for Structural Concrete and Commentary (ACI, 2008)
- ANSI/AISC 341-10 Seismic Provisions for Structural Steel buildings
- ANSI/AISC 358-10 Prequalified Connections for Special and Intermediate Steel moment Frames For Seismic Applications
- ANSI/AISC 360-10 Specification for Structural Steel Buildings
- ANSI/AISC 303-10 Code of Standard Practice for Steel Buildings and Bridges
- TMS 402-11Building Code Requirements and Specifications for Masonry Structures
- ACI 318-11 Building Code Requirements for Structural Concrete
- ANSI/AF&PA NDS 2012 National Design Specification for Wood Construction
- ANSI/AF&PA SDPWS 08 Special Design Provisions for Wind and Seismic (Wood)

Stanford Seismic Advisory Committee

The Stanford Seismic Advisory Committee (SAC) supports and guides the university's structural/seismic objectives in mitigating damage and potential effects of a major earthquake on the Stanford campus. The committee consists of Stanford project managers and planners, along with professional support from earthquake engineering consultants. The SAC engages the



SOURCE: URS Corporation, 2010

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Figure 5.6-4
Project Site Design Ground Motion Zones

assistance of other design professionals and earthquake experts as warranted. The committee plays a key role in coordinating the implementation of the guidelines on Stanford capital projects, and facilitating communication related to seismic issues. The SAC's primary responsibilities are in the following areas:

- Seismic risk analysis and capital planning guidance;
- Development and administration of the Seismic Engineering Guidelines including performance levels, facilities classifications, and guidelines interpretation;
- Recommendation for peer reviewer and peer review oversight;
- Resolution of project-specific issues and decision-making support on capital projects, which cannot be resolved satisfactorily by the project team and project manager;
- Staff education and training of structural engineering/seismic trends, changes, codes, seismic risk analysis, and seismic performance of buildings and structures;
- Earthquake preparedness and awareness; and
- Post-earthquake response, recovery and safety inspections of buildings.

5.6.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on geology and soils if it would:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.

   ii. Strong seismic ground shaking

   iii. Seismic-related ground failure, including liquefaction

   iv. Landslides;

b) Result in substantial soil erosion or the loss of topsoil;

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

In addition, the Project would have a significant impact on mineral resources if it would:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Approach to Analysis

In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015,[7] the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might impact a project's users or residents, except where the proposed project would significantly exacerbate an existing environmental condition. Thus, with respect to seismic hazards, this EIR is not required to consider the effects of bringing a new population into an area where such hazards exist because the Project would not increase or otherwise affect the conditions that create those risks. Furthermore, the identified significance criteria related to locating development on unstable geologic units and soils are valid only to extent that the Project significantly exacerbates those risks. Nonetheless, potential seismic and geologic hazards, and applicable regulatory mechanisms that address these effects, are disclosed in this section.

The potential for impacts related to geology and soils at the Project site were determined by a review of the existing conditions and resources documenting geotechnical hazards prepared by the California Geological Survey (CGS), United States Geological Survey (USGS), and site-specific geologic studies conducted at Stanford. Based on the Project characteristics and the Project site location, the proposed 2018 General Use Permit was determined to have no potential impact on geology and soils significance criteria (a)(i), and (e), and mineral resources significance criteria (a) and (b), above:

> **Fault Rupture –** As discussed in the Environmental Setting, there are no active faults that intersect or are immediately adjacent to the Project site boundaries, and as such, the potential for fault rupture at the Project site is considered very low. Therefore, there would be no Project impact related to this hazard, and accordingly, it is not discussed further.
>
> **Septic Tanks** – All future development under the 2018 General Use Permit would connect to existing or expanded wastewater collection infrastructure at the campus, and conveyed to, the Regional Water Quality Control Plant in Palo Alto for treatment, prior to discharge to the San Francisco Bay. No development that would occur under the 2018 General Use Permit would include the use of septic tanks or other alternative waste disposal systems that are dependent on site soil conditions. Consequently, there would be no Project impact related to this criterion, and accordingly, it is not discussed further.

[7] *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal.4th 369. Opinion Filed December 17, 2015.

Loss of Mineral Resource or Mineral Recovery Site – As described in the Environmental Setting, the California Geological Survey (CGS) designates portions of land in the San Juan and Lagunita Development Districts within the Academic Growth Boundary, and portions of open space land within the Foothills Development District, as Mineral Resource Zone 3 (MRZ-3), defined as areas containing mineral deposits which have not been evaluated for their importance. The CGS does not identify the Project site as an area of regionally significant aggregate resources. The majority of new development under the 2018 General Use Permit would be concentrated in infill and redevelopment sites within the Academic Growth Boundary. Furthermore, the Project does not include mineral resource extraction as a proposed activity. Accordingly, the Project would not result in the loss of availability of a mineral resource of local, regional or statewide importance. Consequently, this criterion is not discussed further.

Impact Evaluation

Construction Impacts

Impact 5.6-1: Project construction would not result in substantial soil erosion or loss of topsoil. (*Less than Significant*)

Construction activities associated with new development under the 2018 General Use Permit would involve earthwork activities, including grading and stockpiling of soils. Disturbance of soils formerly protected with vegetation or covered by asphalt or concrete can become exposed to winds and water flows that result in soil erosion or the loss of topsoil.

Individual projects developed under the 2018 General Use Permit would be required to implement construction best management practices (BMPs), as detailed in the Storm Water Pollution Prevention Plan (SWPPP) as required by the Construction General Permit from the National Pollution Discharge Elimination System (NPDES) program. Although these measures are intended to prevent sedimentation from entering runoff from the construction site, they also serve to prevent soil erosion and loss of topsoil occurring at the construction site. Thus, with adherence to the required BMPs, potential construction-related erosion effects would be minimized.

Following completion of construction activities for individual projects under the 2018 General Use Permit, disturbed areas would be either revegetated through landscaping or covered by impervious surfaces such as structures or asphalt which limits the potential for erosion. Thus, construction activities that would occur under the Project would result in less-than-significant soil erosion impacts. For further discussion of soil erosion and sedimentation, see also Section 5.9, Hydrology and Water Quality, in this EIR.

Mitigation: None required.

Operational Impacts

Impact 5.6-2: Project development would not expose people or structures to substantial adverse effects from ground shaking. (*Less than Significant*)

As discussed in the Environmental Setting, the Project site is located in a seismically active region that contains a number of active faults and the Working Group on California Earthquake Probabilities (WGCEP) indicate there is a 72 percent chance that a magnitude 6.7 or greater earthquake would occur in the Bay Area region over the following 30 years. If not designed appropriately, a 6.7 or greater magnitude earthquake on one of these regional active faults could produce significant groundshaking at the Project site causing damage to structures.

Earthquakes are unavoidable hazards, and the resultant damage can be minimized through appropriate seismic design and engineering practices. As described in the Regulatory Setting and further below, as part of the County's approval process for individual projects under Stanford's General Use Permit the County requires Stanford to demonstrate compliance with all requirements of the California Building Code (CBC), the County Geologist, the County Building Inspection Office, the Stock Farm Monocline Agreement, and any other agreements defined during the term of the General Use Permit with regard to reduction of seismic risk.

The County requires that all construction meet the most recent standards of the CBC for construction, which considers proximity to potential seismic sources and the maximum anticipated groundshaking possible. The proposed construction under the Project would be required to be in accordance with the most recent version of the CBC, which requires structural design that can accommodate ground accelerations expected from known active faults according to site-specific seismic design criteria. In addition, as required by the County, any projects that would be developed within the Stock Farm Monocline demarcated area of the campus (Figure 5.6-3) would need to adhere to additional seismic design criteria. Furthermore, Stanford requires adherence to site-specific seismic design criteria for different zones of the core campus (Figure 5.6-4) pursuant to Stanford's Seismic Engineering Guidelines.

Site-specific geotechnical investigations for each project, as required by the CBC, County and Stanford would be prepared by a California registered Geotechnical Engineer and include final design parameters for any walls, foundations, foundation slabs, and surrounding related improvements (utilities, roadways, parking lots and sidewalks). The final design level geotechnical report for each project under the proposed 2018 General Use Permit would be reviewed and approved by the County Planning and Development Department prior to issuance of a building permit, ensuring that seismic design requirements are incorporated into construction specifications. Compliance with the building safety design standards of the CBC, the County and Stanford would reduce potential impacts associated with ground shaking in projects developed under the 2018 General Use Permit to a less-than-significant level.

Mitigation: None required.

Impact 5.6-3: Project development would not expose people or structures to potential substantial adverse effects associated with liquefaction or lateral spreading, including the risk of loss, injury or death, in the event of a major earthquake on one of the regional active faults. (*Less than Significant)*

The presence of any saturated loose unconsolidated soils associated with a shallow groundwater table beneath development proposed under the 2018 General Use Permit could result in the potential for liquefaction. Liquefaction at a building site could result in loss of bearing pressure, lateral spreading, sand boils (liquefied soil exiting at the ground surface), and earthquake-induced settlement. Future earthquakes could potentially produce damaging effects at the site, if proposed improvements are not adequately designed. As noted in the Environmental Setting section above, portions of the Project site identified as being moderately susceptible to liquefaction, including portions or all of the Campus Center, West Campus, DAPER and Administrative, Arboretum, Quarry and San Juan Development Districts.

Whether a soil will liquefy under seismic shaking depends on site-specific conditions and can only be determined through a site specific geotechnical investigation that can include subsurface soil sampling and testing for liquefaction potential. In accordance with Chapter 16 of the CBC, a final design level geotechnical report would be prepared for each individual project under the 2018 General Use Permit prior to building permit approval that evaluates and provides recommendations to reduce potential liquefaction hazards to less than significant levels. Liquefaction and lateral spreading hazards are generally addressed through foundation design, treatment of site soils, and/or replacement of liquefiable soils with engineered fills. The recommendations are then incorporated into building design plans in accordance with CBC requirements and any additional requirements from County and Stanford review.

Adherence to building code requirements using geotechnical design measures outlined in the final design level geotechnical report and approved by the County, would minimize the potential for effects related to liquefaction and lateral spreading. Implementation of these building code requirements and geotechnical measures for individual project developed under the 2018 General Use Permit would ensure that seismically-induced ground failure including liquefaction and lateral spreading would be a less than significant impact.

Mitigation: None required.

Impact 5.6-4: Project development would not expose people or structures to potential substantial adverse effects associated with landslides, including the risk of loss, injury or death, in the event of a major earthquake on one of the other regional active faults. (*Less than Significant*)

The Project site is located in a seismically active region that includes the San Andreas fault approximately two miles to the west. A seismic event on the San Andreas fault or one of the other active regional faults could induce slope failure or landslides. As discussed in the Environmental Setting, areas of the Project site identified by CGS as highly susceptible to seismically induced

landslides are almost entirely limited to areas of steep slopes within the Foothills Development District. Maps prepared for the Stanford Community Plan also indicate certain areas within the Project site that are susceptible to slope instability, including portions of the Lagunita, San Juan and Foothills Development Districts (see Figure 5.6-2).

The County requires all new development to meet the design standards set forth in the most recent version of the CBC which includes identification of slope stability and factor of safety minimum requirements (Chapter 1803A.5.11). All development that would occur under the Project would be required to be in accordance with the most recent version of the CBC, which requires an evaluation of slope stability to ensure that improvements are not adversely affected by a landslide triggered by a design level seismic event.

A final design level geotechnical report for each project under the proposed 2018 General Use Permit would be prepared by a California registered Geotechnical Engineer or Engineering Geologist and recommendations would include final design parameters for the walls, foundations, foundation slabs, and surrounding related improvements for each site-specific proposed improvement. Compliance with these building safety design standards would reduce potential impacts associated with seismically induced landslides to a less-than-significant level.

Mitigation: None required.

Impact 5.6-5: Project development would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant*)

As discussed in Impact 5.6-1, above, with implementation of construction BMPs included in the SWPPP as required by the Construction General Permit from the NPDES program, potential construction-related erosion effects associated with new development under the 2018 General Use Permit would be minimized.

Erosion potential for individual projects would be reduced once construction is complete due to soils being covered with impervious surfaces such as asphalt, concrete, and buildings. Following construction, drainage control features would be implemented for each project to ensure that stormwater runoff is managed in accordance with drainage control requirements set forth by local and state requirements (see Section 5.9, Hydrology and Water Quality, for further discussion of drainage control requirements). Each project under the 2018 General Use Permit would be required to implement post-construction BMPs that include erosion control measures. Thus, operation of the new development under the proposed Project would not result in substantial soil erosion or the loss of topsoil, and impacts would be less than significant. For further discussion of soil erosion and sedimentation effects during implementation of the Project, see Section 5.9, Hydrology and Water Quality.

Mitigation: None required.

Impact 5.6-6: Project development would not result in substantial adverse effects from on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse as a result of being located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project development. (*Less than Significant*)

The Project site covers a large area with a range of underlying soil profiles but generally characterized by fine-grained natural levee deposits derived from a system of drainages. As discussed in Impact 5.6-4, above, certain areas of the Project site are susceptible to landslides or slope failure, including portions of the Lagunita, San Juan and Foothills Development Districts. Slope failure can be triggered by heavy rainfall, changes in groundwater elevation, saturation by leaking utilities or impounded water, stream incision, man-made excavations and fill placement, as well as by seismic ground shaking (discussed above). Movement can cause large vertical and horizontal ground displacements that block roads and damage buildings.

Typically, slope failure hazards can be addressed through some combination of setbacks, drainage improvements, retaining walls, grading, and other geotechnical measures. A final design level geotechnical report for new development under the 2018 General Use Permit would be prepared by a California registered Geotechnical Engineer or Engineering Geologist and recommendations would include final design parameters for the walls, foundations, foundation slabs, and surrounding related improvements for each site-specific proposed improvement. Compliance with these building safety design standards per CBC Chapter 1803 would reduce potential impacts associated with landslides to a less-than-significant level. See also the potential for Project-related lateral spreading and liquefaction, described above in Impact 5.6-3.

Chapter 18 of the CBC provides requirements for geotechnical reports to include evaluation and geotechnical design measures to address any soils that are found incapable of supporting the proposed improvements. Placement of structures or other improvements such as roads and sidewalks can represent new loadings on natural soils or artificial fills that could compress over time. The required geotechnical report for any new development or redevelopment associated with the 2018 General Use Permit would determine the susceptibility of the subject site to settlement from compressible soils and prescribe appropriate engineering techniques for reducing its effects.

Any areas of artificial or undocumented fill, if present, would require removal and replacement with engineered fill or replacement of excavated materials and compacted to building code standards found in Chapter 18 of the CBC. Areas where improvements may overlay varying fill thicknesses could be subject to differential settlement where underlying materials settle at different rates, causing damage to foundations. Site preparation methods of establishing similar fill thickness across building pad footprints vastly improve the performance of foundations, and this would be included in the final geotechnical engineering recommendations.

The potential for unstable soils to be present at the Project site depend on site specific conditions and the scope of proposed improvements which would be evaluated as part of the required geotechnical investigations. Site preparation measures—such as use of engineered fill, surcharging, wick drains, deep foundations, structural slabs, hinged slabs, flexible utility connections, and utility hangers—could be used to address any stability hazards. These measures

would be evaluated and the most effective, feasible, and economical measures recommended in a geotechnical report and incorporated into site design in accordance with building code requirements. Engineering recommendations included in the project engineering and design plans would be reviewed and approved by the County. Therefore, with adherence to building code requirements the potential for unstable soils to adversely affect new development under the 2018 General Use Permit would be reduced to a less-than-significant level.

Mitigation: None required.

Impact 5.6-7: Development under the proposed Project would not be located on expansive soils that would create substantial risks to life or property. (*Less than Significant*)

Expansive soils increase in volume when their moisture content becomes elevated. Structures built on expansive soils could experience foundation cracking as a result of seasonal expanding and contracting of soils over time. The presence of expansive soils depends on site specific characteristics of underlying soils. However, building damage due to volume changes associated with expansive soils can be reduced through proper foundation design. Replacement of native soils with engineered fill or addition of soil amendments are effective means of mitigating expansive soils. As a requirement of the CBC, as above, any development under the 2018 General Use Permit would be required to complete a final geotechnical investigation that includes site-specific recommendations for the mitigation of potentially expansive soils.

Geotechnical investigation and analysis of underlying soils inform the recommended structural design of the building. Therefore, implementation of standard geotechnical engineering practices and adherence to building code requirements would identify and reduce potential impacts from expansive soils on new development under the 2018 General Use Permit to a less-than-significant level.

Mitigation: None required.

Cumulative Impacts

Impact 5.6-8: Development facilitated by the proposed Project, combined with past, present, and reasonably foreseeable probable projects, would not result in substantial adverse cumulative impacts to geology, soils, or seismic hazards. (*Less than Significant*)

Although the entire Bay Area is located within a seismically active region with a high risk for seismic hazards and a wide variety of geologic conditions, the geographic scope of potential geology and soils impacts is restricted to the Project site and immediate vicinity because related risks are relatively localized or even site-specific. Accordingly, potential seismic related hazards, including groundshaking and earthquake-induced liquefaction and landslides, would not be considered cumulative in nature. Similarly, other potential geologic hazards such as unstable

soils, expansive soils, and slope stability would also be localized or site-specific, and as a result, would not be cumulative in nature.

Construction activities at the Project site similar to other cumulative development greater than one acre in size are required to comply with the NPDES Construction General Permit which contain erosion control requirements that would minimize the potential for erosion. The NPDES program requires the preparation and implementation of SWPPPs for construction activities that include BMPs that ensure erosion control measures are included during construction. The individual projects under the 2018 General Use Permit would be required to comply with these regulations, as would other cumulative development. Similarly, individual projects under the 2018 General Use Permit would be required to implement post-construction BMPs that include erosion control measures, as would other cumulative development. Therefore, the proposed Project in conjunction with other nearby cumulative development would not have a cumulatively significant impact associated with erosion.

Given the factors discussed above, no cumulative seismic related and geologic hazards are identified, and the proposed Project in conjunction with other nearby cumulative development would not have a cumulatively significant impact associated with erosion.

Mitigation: None required.

5.6.6 References

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5.7 Greenhouse Gas Emissions

5.7.1 Introduction

This section addresses the potential for implementation of the proposed 2018 General Use Permit to result in impacts related to climate change and the generation of greenhouse gas (GHG) emissions. The section presents an overview of global and local climate change under the existing and 2018 environmental settings, and a discussion of applicable federal, State, and regional GHG regulations; and examines the potential for the proposed Project to result in increased GHG emissions, which contribute to climate change. The impact analysis includes an evaluation of the consistency of the 2018 General Use Permit with statewide and local planning efforts to reduce GHG emissions. The section relies in part on two technical reports prepared by Stanford in support of the proposed 2018 General Use Permit application: (1) a GHG Technical Report (see Appendix GHG), which was independently peer reviewed by ESA; and (2) a Vehicle Miles Travelled (VMT) Analysis (Appendix VMT), which was independently peer reviewed by ESA and AECOM. This GHG analysis is also closely coordinated with the EIR analyses of potential impacts related to air quality and transportation, which are presented in Sections 5.2*,* Air Quality, and 5.15, Transportation and Traffic, respectively.

Geographical Scope

GHG emissions have applicable context both regionally and locally. Localized emissions of GHGs contribute to the global concentrations of GHGs that accumulate globally to create climate change impacts that have local and global effects.

As explained in Chapter 3, Project Description, the proposed 2018 General Use Permit governs the entire Project site, however, it would not apply to development that is permitted by right under the County Zoning Ordinance. The single-family and two-family residences in the faculty/staff subdivision are permitted as of right, and therefore were not included in the study area within which Project GHG emissions are analyzed. In addition, under the 2018 General Use Permit Stanford does not propose development in areas zoned for medium-density faculty and staff housing (the Peter Coutts, Pearce Mitchell, and the Olmsted Terrace housing areas); or within any areas that are outside the Academic Growth Boundary. Therefore, these areas are similarly are not included within the study area for analysis of Project GHG emissions.

The study area for Project GHG emissions includes all areas of the Project site that would be subject to the proposed 2018 General Use Permit and designated as Academic Campus and Campus Open Space in the Stanford Community Plan.

5.7.2 Existing Environmental Setting

Climate change is the cumulative effect of the accumulation of all natural and anthropogenic sources of GHGs[1] on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change (AEP, 2007; OPR, 2008).[2,3] Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to specific local or global climate changes.

The State of California, through Assembly Bill (AB) 32, Senate Bill (SB) 32, Executive Order S-3-05, and Executive Order B-30-15 has set state-wide targets for the reduction of GHG emissions. The goal of AB 32, Executive Order S-3-05, and Executive Order B-30-15 is to reduce future GHG emissions in a state that is expected to experience rapid growth in population and economic output.

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth' s near-surface air and oceans since the mid-20th century and its projected continued rise in temperature. It is estimated that global surface temperatures have increased approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years (CCCC, 2006).

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) has concluded that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward due to particulate loading of the stratosphere from volcanic eruptions. After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation are believed to be responsible for most of the observed temperature increase.

Increases in GHG concentrations in the earth's atmosphere are the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has reached the earth. Some GHGs occur naturally and are necessary for keeping the earth's surface habitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years

1 For the purposes of this analysis, the term "GHGs" refers to carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride, those gases regulated under California AB 32 and the Kyoto Protocol of the United Nations Framework Convention on Climate Change. Although the State of California also declared nitrogen trifluoride a GHG, there is no nitrogen trifluoride associated with this project. Therefore, nitrogen trifluoride will not be further considered.

2 Alternative Approaches to Analyzing GHG Emissions and Global Climate Change in CEQA Documents. Accessed July 8, 2016. http://www.placer.ca.gov/Departments/CommunityDevelopment/EnvCoordSvcs/EIR/Homewood/drafteir/~/media/cdr/ECS/EIR/Homewood/ClimateChange/1_AEP2007.ashx

3 Technical Advisory. CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review. June 19. Accessed July 8, 2016. http://opr.ca.gov/docs/june08-ceqa.pdf

have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Greenhouse Gases

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are the principal GHGs. When concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect may be enhanced. CO_2, CH_4, and N_2O occur naturally but are also generated through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing[4] associated with agricultural practices and landfills. Other human-generated GHGs, which have much higher heat-absorption potential than CO_2, include fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6), which are byproducts of certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2, CH_4, and N_2O are substantially more potent GHGs than CO_2, with GWPs of 25 and 298 times that of CO_2, respectively[5].

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons (MTs) of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e.

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations of CO_2). In pre-industrial times, concentrations of atmospheric CO_2 were approximately 280 parts per million (ppm) (GRID-Arendal, 2014). By August 2013, atmospheric CO_2 concentrations had increased to 395 ppm, over 40 percent above pre-industrial concentrations (ESRL, 2016). There is international scientific consensus that human-caused increases in GHGs have contributed and will continue to contribute to global warming.

Impacts of Climate Change

Impacts in California

In the Findings and Declarations for AB 32, the State Legislature found that potential adverse impacts of global warming exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of

4 Off-gassing is defined as the release of chemicals under normal conditions of temperature and pressure.

5 These GWP values are based in IPCC's Fourth Assessment Report which are the underlying values use in state and federal regulatory efforts to date. While IPCC has published different values in its 5th Assessment Report, these updated values have not yet adopted by the regulatory agencies in the development of GHG reduction targets which are the basis for impact assessment herein.

coastal businesses and residences, damage to the marine ecosystems and the natural environment, and an increase in health-related problems The Sierra snowpack, an important source of water supply for the state, has shrunk 10 percent in the last 100 years. It is expected to continue to decrease by as much as 25 percent by 2050. World-wide changes are causing sea levels to rise – about eight inches of increase has been recorded at the Golden Gate Bridge over the past 100 years – threatening low coastal areas with inundation and serious damage from storms" (CARB, 2008).

Ecosystem and Biodiversity Impacts

Climate change is expected to have effects on diverse types of ecosystems, from alpine to deep-sea habitat (USEPA, 2016). As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels" (IPCC, 2007). Shifts in existing biomes could also make ecosystems vulnerable to encroachment by invasive species. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate.

Human Health Impacts

Climate change may generate disproportionate negative impacts related to vector-borne diseases, waterborne illnesses, temperature-related risks, air quality, extreme weather, food safety, to minority populations and persons with mental health illness (USEPA, 2016b). Climate change may increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects such as malaria, dengue fever, and yellow fever; and encephalitis Cholera, which is associated with algal blooms, could also increase (NCBI, 1993). While these health impacts would largely affect tropical areas, effects would also be felt in California. For example, warming of the atmosphere is expected to increase smog and particulate pollution, which will adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events are also expected to occur with more frequency. The elderly, children, and the homeless are particularly vulnerable to extreme heat events. Finally, water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

Greenhouse Gas Emissions Estimates

Global Emissions

Worldwide emissions of GHGs in 2011 were 45 billion tons of CO_2e per year (CAIT, 2014). This estimate includes ongoing emissions from industrial and agricultural sources, but excludes emissions from land use changes.

U.S. Emissions

In 2014, the United States emitted about 6.87 billion tons of CO_2e per year or about 21.5 tons/ person/ year. Of the five major sectors nationwide — residential and commercial, industrial, agriculture, transportation, and electricity— electricity accounts for the highest fraction of GHG emissions (approximately 30 percent), closely followed by transportation (approximately 26 percent); these emissions from energy are primarily generated from the combustion of fossil fuels (approximately 82 percent), and emissions from transportation are entirely generated from direct fossil fuel combustion (USEPA, 2016c).

State of California Emissions

In 2014, California emitted approximately 441.5 million tons of CO_2e. This represents about 6.4 percent of total U.S. emissions. This large number is due primarily to the sheer size of California compared to other states. By contrast, at 11.4 tons/person/year California has one of the lowest per capita GHG emission rates in the country (CARB, 2016a). This is in part due to the success of the State's energy efficiency and renewable energy programs and commitments that have lowered the GHG emissions rate of growth by more than half of what it would have been otherwise (CEC, 2007). Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The 2016 California Air Resources Board (CARB) inventory also reports that the composition of gross climate change pollutant emissions in California in 2016 (expressed as CO_2e) were as follows:

- CO_2 accounted for 84.3 percent;
- CH_4 accounted for 9 percent;
- NO_2 accounted for 2.8 percent; and
- High GWP gasses (HFCs, PFC, and SF_6) accounted for 3.9 percent.

Of these gases, CARB found that transportation is the source of approximately 37 percent of the state's GHG emissions, followed by industrial sources at 24 percent and electricity generation (both in-state and out-of-state) at 20 percent. Agriculture is the source of approximately 8 percent, and residential activity is the source of about 6 percent, followed by commercial activities at 5 percent (CARB, 2016a).

Bay Area Emissions

In the San Francisco Bay Area, the last inventory prepared by the Bay Area Air Quality Management District (BAAQMD; dated 2011, and updated in 2015) indicates that the transportation sector and industrial/commercial sector represent the largest sources of GHG emissions, accounting for 39.7 percent and 35.7 percent, respectively, of the Bay Area's 86.6 million tons of CO_2e in 2011. Electricity/co-generation sources account for about 14 percent of the Bay Area's GHG emissions, followed by residential fuel usage at about 7.7 percent. Off-road equipment sources currently account for approximately 1.5 percent of total Bay Area GHG emissions (BAAQMD, 2015).

Santa Clara County Emissions

In 2015, BAAQMD prepared GHG inventories for each of the nine Bay Area Counties (BAAQMD, 2015). In this report, annual GHG emissions in Santa Clara County for basis year 2011 were listed as 16.0 MMT CO_2e.

5.7.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020. Since the EV Graduate Residences is not expected to be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline.

The GHG Technical Report (see Appendix GHG), estimated the GHG emissions in the study area for the 2018 environmental baseline condition, including from electricity use, natural gas combustion, mobile sources, emergency generators, water conveyance and treatment, waste disposal, construction emissions and other miscellaneous sources. The estimated emissions are presented in **Table 5.7-1**.

A comparison of the emissions inventories for years 2014 and 2015 to that of the 2018 environmental baseline shows a general trend in decreased GHG emissions for the Project study area between 2014 and 2018. This is due to several factors. Mobile sources would have lower GHG emissions in 2018 based on ongoing improvements in the vehicle fleet as old vehicles are replaced with newer, cleaner vehicles, and existing regulatory standards that are resulting in lower emitting vehicles and cleaner fuels.

In addition, changes to Stanford's energy systems have occurred since 2014 that have resulted in substantially decreased GHG emissions. In 2015, Stanford completed an overhaul of its campus heating and cooling system, known as Stanford Energy System Innovations (SESI), which replaced Stanford's steam-based heating system with a hot-water based heating system, and replaced its cogeneration plant with a more efficient Central Energy Facility (CEF). In addition, Stanford procures electricity via a direct access program from the grid through Electricity Service Providers that includes renewable resources within their portfolios. The 2018 environmental baseline also does not include GHG emissions from the Valero service station, previously located at 715 Serra Street, which was also closed in 2016.

TABLE 5.7-1
2018 BASELINE GHG EMISSIONS

GHG Source	GHG Emissions (metric tons CO2e per year)
Electricity	
PG&E Commercial	37
PG&E Searsville/Olmstead	50
Direct Access	650
Imported to Campus and CEF	34,021
Non-Stanford Commercial	577
Subtotal	**35,336**
Natural Gas	
PG&E Residential	3,112
PG&E Commercial	16,942
PG&E Searsville/Olmstead	71
Hot Water Generators	5,817
Replacement Process Steam Plant	4,725
Subtotal	**30,667**
Mobile Sources	
Worker Trips	20,377
Resident Trips	12,738
Campus Vehicles On-road	5,678
Campus Vehicles Off-road	235
Other Trips	14,609
Subtotal	**53,637**
Emergency Generators	
Subtotal	363
Solid Waste	
Subtotal	4,075
Water Transport and Treatment	
Domestic Water Use	327
Wastewater Treatment	124
Direct Wastewater Emissions	470
Subtotal	920
Miscellaneous Sources	
On-Campus Research and Fire Suppression	294
Construction Equipment	379
Subtotal	674
Total Emissions 2018	**125,672**

SOURCE: Ramboll Environ, 2017.

Also importantly, the 2018 environmental baseline reflects Stanford's commitment to acquire electricity from the Stanford Solar Generating Station in Kern County and to build new solar systems on campus. The Kern County solar facility, which became operational in January 2017, provides a 68-megawatt peak solar plant generating 159,000 megawatt-hours per year (MWh/year). While Stanford does not transport and use the energy generated at the Kern County solar facility on the Project site, Stanford receives Renewable Energy Credits for the electricity it produces there, which offset the non-renewable energy GHG emissions it consumes locally. In addition, several Stanford building complexes will feature solar panels, including the Science and Engineering Quad and the Knight Management Center. Installation began in May 2016 on rooftop panels for an additional 16 campus buildings to provide an additional 5 MW, which will generate up to 7,300 MWh/year. These two solar systems are expected to provide up to 53 percent of Stanford's total electricity use.

5.7.4 Regulatory Setting

The following discussion presents a focused summary of the federal, State and local regulatory framework related to GHG emissions. For a more comprehensive compilation please see Appendix GHG.

Federal

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

In *Massachusetts v. Environmental Protection Agency* et al., 12 states and cities, including California, together with several environmental organizations, sued to require the USEPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The U.S. Supreme Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and the USEPA had the authority to regulate GHG emissions.

On December 7, 2009, the USEPA Administrator signed two findings regarding GHGs under Section 202(a) of the Federal Clean Air Act (FCAA):

- *Endangerment Finding:* The current and projected concentrations of six key GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- *Cause or Contribute Finding:* The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the USEPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the USEPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy…." The Reporting Rule applies to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in

2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for the USEPA to verify annual GHG emissions reports.

Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards

In response to the *Massachusetts v. EPA* ruling, the Bush Administration issued an Executive Order on May 14, 2007, directing the USEPA, the Department of Transportation (DOT), and the Department of Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008.

On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for passenger cars and light trucks in model years 2011 through 2015. The NHTSA issued a final rule for model year 2011 on March 30, 2009 (NHTSA, 2009).

On May 7, 2010, the USEPA and the NHTSA issued a final rule regulating fuel efficiency and GHG pollution from motor vehicles for cars and light-duty trucks for model years 2012–2016 (USEPA, 2010). On May 21, 2010, President Obama issued a memorandum to the Secretaries of Transportation and Energy, and the Administrators of the USEPA and the NHTSA calling for establishment of additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure (GPO, 2010). In response to this directive, the USEPA and NHTSA issued a Supplemental Notice of Intent announcing plans to propose stringent, coordinated federal greenhouse gas and fuel economy standards for model year 2017-2025 light-duty vehicles (GPO, 2011). The agencies proposed standards projected to achieve 163 grams/mile of CO_2 in model year 2025, on an average industry fleet wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. California has announced its support of this national program (CARB, 2011). The final rule was adopted in October 2012, and NHTSA intends to set standards for model years 2022-2025 in a future rulemaking (USEPA, NHTSA, 2012).

Heavy-duty Engines and Vehicles Fuel Efficiency Standards

In addition to the regulations applicable to passenger vehicles and light-duty trucks, on August 9, 2011, the USEPA and the NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks, which applies to vehicles from model year 2014-2018 (USEPA, 2011). USEPA and NHTSA adopted standards for CO_2 emissions and fuel consumption respectively, tailored to each of three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to USEPA, this program is expected to reduce GHG emissions and fuel consumption for affected vehicles by nine percent to 23 percent. In August 2016, the USEPA and NHTSA adopted the next phase (Phase 2) of the fuel economy and GHG standards for medium- and heavy-duty trucks, which apply to vehicles with model year 2018 and later (U.S. EPA, 2016d). In response to the USEPA's adoption of the Phase 2 standards, California Air Resources Board (CARB) staff plan to bring a proposed California Phase 2 program before its Board in 2017 (CARB, 2016b).

Energy Independence and Security Act

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law (GPO, 2007). Among other key measures, the Act called for the following steps to aid in the reduction of national mobile and non-mobile GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances; and
- While superseded by NHTSA and USEPA actions described above, EISA also set miles per gallon targets for cars and light trucks and directed the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

State

The legal framework for GHG emission reduction in California has come about through Executive Orders, legislation, and regulation, as described below.

Assembly Bill 32 and the California Climate Change Scoping Plan

AB 32

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

AB 32 anticipates that the GHG reduction goals will be met, in part, through local government actions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

Scoping Plan

Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008 (re-approved by CARB on August 24, 2011 [CARB, 2008]) outlining measures to meet the 2020 GHG reduction goals. In

order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels or about 15 percent from today's levels. The Scoping Plan recommends measures for further study and possible State implementation, such as new fuel regulations. It estimates that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and other sources could be achieved should the State implement all of the measures in the Scoping Plan. The Scoping Plan relies on the requirements of Senate Bill (SB) 375 (discussed below) to implement the carbon emission reductions anticipated from land use decisions.

Scoping Plan 2014 Update

An update to the initial Scoping Plan was adopted developed by CARB in collaboration with the California Climate Action Team (CCAT) to address the requirement by AB 32 that the Scoping Plan be updated at least every five years. The Update builds upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. The first update to the AB 32 Scoping Plan was approved on May 22, 2014 by CARB.

The Update describes the state's progress towards AB 32 goals. It found that, "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32." In addition, the update stated, "if California realizes the expected benefits of existing policy goals (such as 12,000 MW of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050."

In addition, as part of the update to the Scoping Plan, the emissions reductions required to meet the 2020 statewide GHG emissions limit were adjusted. The primary reason for adjusting the 2020 statewide emissions limit was based on the fact that the original Scoping Plan relied on the IPCC's 1996 Second Assessment Report (SAR) to assign the GWPs of greenhouse gases. Recently, in accordance the United Nations Framework Convention on Climate Change (UNFCCC), international climate agencies have agreed to begin using the scientifically updated GWP values in the IPCC's Fourth Assessment Report (AR4) that was released in 2007. Because CARB has begun to transition to the use of the AR4 100-year GWPs in its climate change programs, CARB recalculated the Scoping Plan's 1990 GHG emissions level with the AR4 GWPs (CARB, 2014).

Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS), established in 2002 and amended in 2006 and 2011 pursuant to Recommended Action E-3 of the Scoping Plan, requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020. The RPS also requires 20 percent of retail sales to be sourced from renewable energy by 2013, and 25 percent of retail sales to be sourced from renewable energy by

2016. The RPS provisions apply to investor-owned utilities, community choice aggregators, electric service providers, and publicly owned utilities.

Advanced Clean Cars

In January 2012, pursuant to Recommended Measures T-1 and T-4 of the Scoping Plan, CARB approved the Advanced Clean Cars Program, a new emissions-control program for model year 2017 through 2025.The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

The program also requires car manufacturers to offer for sale an increasing number of zero-emission vehicles (ZEVs) each year, including battery electric, fuel cell, and plug-in hybrid electric vehicles. In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017-2025 through compliance with the EPA GHG requirements for those same model years (CARB, 2012).

Cap-and-Trade Program

The Scoping Plan identifies cap-and-trade as a key strategy for helping California reduce its GHG emissions (CARB, 2008). A cap-and-trade program sets the total amount of greenhouse gas emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. AB 32 required CARB to complete major rulemakings for reducing GHGs including market mechanisms by January 1, 2011. AB 32 also required the program itself was to begin in 2012. The first auction of "carbon offset credits" was held in November 2012.

Carbon offset credits are created through the development of projects, such as renewable energy generation or carbon sequestration projects, that achieve a reduction of emissions or an increase in the removal of carbon from the atmosphere from activities not otherwise regulated, covered under an emissions cap, or resulting from government incentives. Offsets are verified reductions of emissions whose ownership can be transferred to others. As required by AB 32, any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional. Offsets used to meet regulatory requirements must be quantified according to CARB-adopted methodologies, and CARB must adopt a regulation to verify and enforce the reductions. The criteria developed will ensure that the reductions are quantified accurately and are not double-counted within the system (CARB, 2008).

The Cap-and-Trade Regulation provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade Program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. The recently approved (July 2017) Assembly Bill 398 will ensure that California's Cap-and-Trade system will continue through 2030.

California Supreme Court Ruling in Center for Biological Diversity v. Department of Fish and Wildlife

In its recent decision, *Center for Biological Diversity v. Department of Fish and Wildlife*, 62 Cal. 4th 204 (Newhall), the California Supreme Court evaluated the California Department of Fish and Wildlife's (CDFW) analysis of potential impacts caused by GHG emissions contained in the EIR for the proposed land development called Newhall Ranch (California, 2015). In the EIR, the CDFW analyzed GHG emissions under AB 32, using the business-as-usual (BAU) comparison as its sole criterion of significance.

In Newhall, the Court concluded that a finding of consistency with meeting statewide emission reduction goals is a legally permissible criterion of significance when analyzing potential impacts of GHG emissions under the CEQA. However, the Court found that the EIR's conclusion that the project's emissions would be less than significant under that criterion was not supported by substantial evidence, and remanded back to the appellate court the narrow issue of whether substantial evidence supported the application of AB 32 statewide GHG reduction goal of 29 percent to new land use projects.

The Court then identified "potential options" for lead agencies evaluating cumulative significance of a proposed land use development's GHG emissions in future CEQA documents, but the Court was careful to note that there was no "guarantee" that any of these would be sufficient.

The "potential pathways to compliance" suggested by the Court include the type of numerical GHG significance thresholds used in this EIR. Specifically, the Court favorably cites to the BAAQMD GHG significance thresholds, which are based on compliance with AB 32 and use a "service population" GHG ratio threshold for land use projects and a 10,000 ton annual GHG emission threshold for industrial projects.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger established Executive Order S-3-05, which announced target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Executive orders do not have the same status as a law because in California's constitutional system, it is the Legislature, not the Governor, who is entrusted with the role of making statewide laws (California 1997, p. 836; California 1990.). The Legislature declined to include the Executive Order's 2050 goal in AB 32 and SB 375 (discussed below).

CARB's Scoping Plan to implement AB 32 looked beyond 2020 to assess whether implementing the Scoping Plan would achieve the State's long-term climate goals and determined that "Full implementation of the Scoping Plan will put California on a path toward these required long-term reductions" (CARB 2008, p.117). The 2014 Scoping Plan Update confirmed this stating: "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32;" and it recognizes the

potential for California to "reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050" (CARB 2014, p. 2). However, the 2014 Scoping Plan Update concludes that additional actions will be needed to continue reducing emissions and meet the 2050 goals in the face of anticipated population and economic growth (CARB 2014).

Executive Order B-30-15

In April 2015, Governor Brown signed Executive Order B-30-15, which established the following GHG emission reduction goal for California: by 2030, reduce GHG emissions to 40 percent below 1990 levels. This Executive Order also directed all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in Executive Order S-3-05. Additionally, the Executive Order directed CARB to update its Scoping Plan to address the 2030 goal. In the coming months CARB is expected to develop statewide inventory projection data for 2030, as well as commence its efforts to identify reduction strategies capable of securing emission reductions that allow for achievement of the new interim goal established in Executive Order B-30-15.

The Legislature adopted SB 32 to enact the Executive Order's 2030 goal.

SB 32

Enacted in 2016, Senate Bill (SB) 32 (Pavley, 2016) codifies the 2030 emissions reduction goal of Executive Order B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

SB 32 was coupled with a companion bill: AB 197 (Garcia, 2016). Designed to improve the transparency of CARB's regulatory and policy-oriented processes, AB 197 created the Joint Legislative Committee on Climate Change Policies, a committee with the responsibility to ascertain facts and make recommendations to the Legislature concerning statewide programs, policies and investments related to climate change. AB 197 also requires CARB to make certain GHG emissions inventory data publicly available on its web site; consider the social costs of GHG emissions when adopting rules and regulations designed to achieve GHG emission reductions; and, include specified information in all Scoping Plan updates for the emission reduction measures contained therein.

California Supreme Court Ruling in Cleveland National Forest v. San Diego Association of Governments

The Supreme Court reviewed the adequacy of the GHG analysis in an EIR for a 40-year (2010-2050) Regional Transportation Plan/Sustainable Communities Strategy. The specific issue in the case was whether SANDAG properly declined to adopt a significance threshold for GHG emissions in 2050 based on Governor Schwarzenegger's Executive Order No. S-3-05 that set a GHG emissions-reduction goal of 80% below 1990 levels by 2050. The Court held that SANDAG's decision not to use such a significance threshold was not an abuse of discretion. Further, the Court held that the EIR's discussion of the RTP's GHG emissions in 2050 satisfied CEQA's information and disclosure requirements.

The Court ruled that SANDAG was not required to use the Executive Order's 2050 goal as a significance threshold for GHG impacts because: (1) it is not an "adopted" target within the meaning of CEQA Guidelines section 15064.4(b)(2); (2) the Executive Order does not specify any plan or implementation measures to achieve its goal; and (3) there is no regulatory guidance on how the Executive Order's goal translates into a regional target for a land use and transportation plan such as the RTP.

Senate Bill 375

In addition to policy directly guided by AB 32, the legislature in 2008 passed SB 375 (Chapter 728, Statutes of 2008), which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Regional Transportation Plans (RTPs) developed by the state's 18 metropolitan planning organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) that achieves GHG emission reduction targets set by CARB and coordinates regional housing and transportation. MTC is the federally recognized metropolitan planning organization (MPO) for the nine county Bay Area, which includes Santa Clara County and Stanford.

On July 18, 2013, the Plan Bay Area was jointly approved by ABAG's Executive Board and by MTC. Plan Bay Area includes the region's SCS and the 2040 RTP. The SCS lays out how the region will meet GHG reduction targets set by CARB. CARB's targets call for the region to reduce per capita emissions seven percent by 2020 and 15 percent by 2035 from a 2005 baseline.

A central greenhouse gas reduction strategy of Plan Bay Area is the concentration of future growth within Priority Development Areas (PDAs). To be eligible for PDA designation, an area must be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing. The Project site is not located within a PDA. A draft update to the Plan Bay Area (Plan Bay Area 2040) was released in April 2017.

Pavley Standards (Assembly Bill 1493 of 2002)

In 2002, then-Governor Gray Davis signed Assembly Bill 1493 (Chapter 200, Statutes of 2002), which required the CARB to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, sections 1900 and 1961 (CCR 13 1900, 1961), and adoption of section 1961.1 (CCR 13 section 1961.1), require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight (GVW) rating of less than 10,000 pounds and that is designed primarily for the transportation of persons), beginning with model year 2009. For

passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for model year 2016 are approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24 percent between 2009 and 2016.

Because the Pavley Standards (named for the bill's author, State Senator Fran Pavley) would impose stricter standards than those under the FCAA, California applied to the USEPA for a waiver under the FCAA; this waiver was denied in 2008. In 2009, however, the USEPA granted the waiver.

Executive Order S-1-07

Executive Order S-1-07, signed by then-Governor Arnold Schwarzenegger in 2007, proclaimed that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. It also directed CARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. CARB adopted the Low Carbon Fuel Standard on April 23, 2009.

CEQA and Senate Bill 97

Senate Bill 97 (SB 97) (Chapter 185, Statutes of 2007), signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to augment the State CEQA Guidelines to account for the effects and feasible mitigation of GHG emissions no later than July 1, 2009. The California Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010.

On December 30, 2009, the Natural Resources Agency adopted amendments to the State CEQA Guidelines, as required by SB 97 (CRNA, 2009). The amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The amendments became effective March 18, 2010.

The amendments added Section 15064.4 to the State CEQA Guidelines, specifically addressing the significance of GHG emissions. Section 15064.4 calls for a "good-faith effort" to "describe, calculate or estimate" GHG emissions in CEQA environmental documents. Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions, (2) whether the project emissions would exceed a locally applicable threshold of significance, and (3) the extent to which the project would comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions." Section 15064.4(b)3) states that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of greenhouse gas emissions)

that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located. Section 15064.4 does not, however, set a numerical threshold of significance for GHG emissions.

The revisions also added Section 15126.4[c] which addresses measures to mitigate GHG emissions, when such emissions are found to be significant:

> Consistent with Section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
>
> (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
>
> (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
>
> (4) Measures that sequester greenhouse gases; and
>
> (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

Senate Bill 350

Senate Bill 350 (Chapter 547, Statutes of 2015), signed October 7, 2015, is the *Clean Energy and Pollution Reduction Act of 2015*. SB 350 is the implementation of some of the goals of EO B-30-15. The objectives of SB 350 are,

1. To increase from 33 percent to 50 percent, the procurement of our electricity from renewable sources.
2. To double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

Title 24 Building Energy Efficiency Standards

Title 24 of the California Code of Regulations (CCR) is the means by which California regulates energy consumption. The Title 24 Building Energy Efficiency Standards apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and nonresidential buildings. The Title 24 standards, first adopted by the CEC in 1978, are updated periodically to incorporate new energy efficiency technologies and methods.

The California Green Building Standards Code was adopted as part of Title 24 in 2008 and was last updated in 2016. The code establishes voluntary standards for planning and design for energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, sustainable site development, and internal air contaminants.

California Green Buildings Standards Code (CALGreen)

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24 CCR). The 2013 California Green Building Standards Code (24 CCR, Part 11), also known as the CALGreen code, contains mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools and hospitals) throughout California (CBSC, 2014). The development of the CALGreen Code is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

The CALGreen Code contains requirements for construction waste reduction, indoor water use reduction, natural resource conservation, site irrigation conservation, and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, such as heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

The CALGreen Code provides standards for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others.

Other Local Regulations

BAAQMD 2017 Clean Air Plan

In April 2017, the BAAQMD adopted the *2017 Clean Air Plan*.[6] The plan's primary goals are to protect public health and protect the climate. The plan includes a wide range of proposed control measures, which consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. The 2017 Clean Air Plan contains 85 measures address reduction of several pollutants as well as GHGs. Measures

6 BAAQMD, *Draft 2017 Clean Air Plan, Spare the Air, Cool the Climate,* 2017. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/baaqmd_2017_cap_draft_122816-pdf.pdf?utm_campaign=CAP+2017+Draft&utm_medium=email&utm_content=article3_link1. Accessed on January 13, 2017.

focus on single type pollutants and potent GHGs such as methane and black carbon. These control strategies that are grouped into the following categories:

- Stationary source measures;
- Transportation control measures;
- Energy Control Measures;
- Building Control Measures;
- Agricultural Control Measures;
- Natural and Working Lands Control Measures;
- Waste Management Control Measures;
- Water Control Measures; and
- Super GHG Control Measures.

Santa Clara County Climate Action Plan

Adopted by the Board of Supervisors in September 2009, the Santa Clara County Climate Action Plan focuses on County operations, facilities, and employee actions to reduce greenhouse gas emissions, energy and water consumption, solid waste, and fuel consumption. The County's Climate Action Plan focuses on steps needed to reach a 10 percent greenhouse gas reduction goal by 2015, but also identifies policies and actions that are needed to reduce emissions beyond 2015. Because the County Climate Action Plan is exclusively focused on reducing the GHG emissions from County operations, measures in this plan do not apply to other jurisdictions or private entities in the County, including Stanford.

Stanford

Stanford Energy and Climate Plan

Updated most recently in 2015, Stanford's Energy and Climate Plan includes GHG inventory data for the Stanford campus from 2004 through 2014 and campus growth projections and then provides a GHG emission forecast that informed the development of the Energy and Climate Plan. The Energy and Climate Plan addresses GHG emission reductions from new buildings, existing buildings, and energy supply.

The goals of the Energy and Climate Plan are implemented by high performance building design strategies, energy conservation in existing buildings through Stanford's Energy Retrofit Program, the Whole Building Energy Retrofit Program (WBERP), Energy Conservation Incentive Program (ECIP) and the Plug Load Energy Consumption Reduction program. Key to achieving its GHG reduction goals is the recent replacement of its natural gas-powered cogeneration facility with SESI, Stanford's new heating, cooling, and electricity system.

Santa Clara County General Plan

On August 25, 2015, the County of Santa Clara adopted a new Health Element of the Santa Clara County General Plan. The Health Element incorporates and updates certain subject matter and policies from the previous Health and Safety Chapters of the Santa Clara County General Plan and provides a renewed emphasis on collaborative, comprehensive approaches to planning for

community health. The Health Element Section G., Air Quality and Climate Change, contains the following policies relevant to climate change:

Policy HE-G.5 *- GHG reduction***.** Support efforts to reduce GHG emissions from mobile sources, such as reducing vehicle trips, vehicle use, vehicle miles traveled (VMT), vehicle idling, and traffic congestion. These measures may include improved transit service, better roadway system efficiency state-of-the-art signal timing and Intelligent Transportation Systems, transportation demand management, parking and roadway pricing strategies, and growth management measures.

Policy HE-G.10 **-** *Conservation.* Promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions.

Policy HE-G.11 **-** *Renewable Energy.* Encourage renewable energy, such as solar and wind turbines on commercial, industrial and residential buildings.

Policy HE-G.16 **-** *Heat Island Mitigation.* Support urban greening and the use of green infrastructure to minimize the urban heat island effect.

Policy HE-G.17 **-** *Energy and Resiliency in Homes.* Promote energy retrofits and increase extreme heat resiliency for housing, particularly for lower income and vulnerable populations.

5.7.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on greenhouse gases if it would:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Approach to Analysis

CEQA Guidelines section 15064.4(b) states that in evaluating the significance of impacts from GHG emissions, the lead agency should consider the following factors, among others:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions.

Currently, there is no applicable plan, policy, or regulation enacted or adopted for unincorporated Santa Clara County that meets the standards set forth in Guidelines section 15064.4(b), as the County's Climate Action Plan applies only to the County's municipal operations.

This impact analysis uses the BAAQMD CEQA Guidelines service population metric to assess the significance of the project's contribution to cumulative global GHG emissions. The BAAQMD service population metric is an efficiency-based metric that the BAAQMD developed to assess whether a land use project would further the emission reduction goals for 2020 articulated by the State Legislature in AB 32. To extend the analysis beyond 2020, BAAQMD's service population metric was adjusted to assess whether the Project would be consistent with the State's newly enacted, more stringent, 2030 GHG emissions reduction goal included in the *Clean Energy and Pollution Reduction Act of 2015* (SB 32). This service population metric was further adjusted to identify the additional reductions that would be required by 2035 to achieve a trajectory toward the 2050 goals announced in Executive Order B-16-12. In *Cleveland National Forest Foundation v. San Diego Association of Governments* (Cal. Supreme Court Case S223603, Filed July 13, 2017), the California Supreme Court held that the lead agency did not abuse its discretion in declining to adopt the 2050 goal in Executive Order S-3-05 as its significance criterion for assessing greenhouse gas emissions. There, the Court explained the EIR did not obscure the existence or contextual significance of the Executive Order's 2050 emissions target; the EIR made clear that the 2050 target is part of the regulatory setting in which the plan at issue would operate; and the EIR straightforwardly mentioned the 2050 target in the course of explaining why the lead agency chose not to use the target as a measure of significance. The EIR explained that it is uncertain what role regional land use and transportation strategies can or should play in achieving the EO's 2050 emissions reductions target. Because it remains uncertain as to what plans and policies the State will adopt to achieve the 2050 goal, this analysis similarly declines to adopt the 2050 goal as a significance criterion. However, because the goal is based on sound science, this analysis discusses the goal and assesses whether the project emissions would be consistent with the trajectory needed to achieve the goal.

BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, in conformance with the BAAQMD Guidelines, Table 5.7-2 below provides a quantification of GHG emissions that would occur during construction, and these emissions are included in the emissions total evaluated in Impact 5.7-1.

A qualitative assessment of the Project's consistency with AB 32, the CARB Scoping Plan and updates, the region's Sustainable Communities Strategy/Regional Transportation Plan (Plan Bay Area), Executive Order S-3-05, Executive Order B-16-12, SB 32, and GHG-related policies of the Santa Clara County General Plan is presented by examining predicted GHG emissions for the 2030 and 2035 future years and assessing Stanford's emissions reductions achieved to date as well as acknowledging the role of the regulatory process in achieving the future 2050 reduction goals established.

BAAQMD Significance Threshold

The BAAQMD developed thresholds of significance along with methods for evaluating compliance which are published in its guidance document entitled California Environmental Quality Act Air Quality Guidelines (BAAQMD 2017).

With respect to Project operations, BAAQMD's guidelines establish three potential analysis criteria for land use development projects:

- Compliance with a qualified Climate Action Plan, with a goal consistent with AB 32,
- A mass emissions threshold of 1,100 MT of CO2e per year, or
- A GHG efficiency threshold of 4.6 MT of CO2e per service population (project jobs + project residents).

BAAQMD thresholds are based on the AB 32 GHG reduction goals and a "gap analysis" that attributes an appropriate share of GHG emissions reductions to new land use development projects in BAAQMD's jurisdiction. The efficiency threshold (4.6 MT of CO_2e per service population) was calculated by dividing the AB 32 GHG reduction target for land use development emissions in California by the estimated 2020 population and employment level (BAAQMD, 2009). BAAQMD thresholds are tied directly to AB 32 and state wide emissions reduction goals for 2020.

SB 32 addresses GHG emissions reductions through 2030. Long-term goals for 2030 and 2050 also have been articulated in EO B-30-15 and EO S-3-05, respectively. As discussed previously in the Regulatory Setting section, in the Supreme Court ruling in *Cleveland National Forest v. San Diego Association of Governments* the Court ruled that SANDAG was not required to use the Executive Order's 2050 goal as a significance threshold for GHG impacts because: (1) it is not an "adopted" target within the meaning of CEQA Guidelines section 15064.4(b)(2); (2) the Executive Order does not specify any plan or implementation measures to achieve its goal; and (3) there is no regulatory guidance on how the Executive Order's goal translates into a regional target for a land use and transportation plan such as the RTP.

The Association of Environmental Professionals (AEP) Climate Change Committee recommended in a 2015 white paper that CEQA analyses for multiple-phase projects with post-2020 development not only "consider consistency with the 2020/AB 32-based framework but also analyze the consequences of post-2020 GHG emissions in terms of their impacts on the reduction trajectory from 2020 toward 2050" (AEP, 2015). AEP further recommends that the "significance determination should be based on consistency with substantial progress along a post-2020 trajectory." The AEP white paper is advisory only and is not binding guidance or an adopted set of CEQA thresholds. Given that year 2035 is the horizon year for the full buildout of the 2018 General Use Permit, a post-2020 discussion is warranted.

Consistent with the understanding that to achieve 2030 and 2050 goals there will be a need for deeper reductions in GHG emissions in the post-2020 period, the following analysis evaluates the combination of construction-related and operational GHG emissions by using two different metrics:

- Project emissions at full Project buildout in 2035 are compared to a 2030 threshold of 2.7 MT of CO_2e per service population. This 2030 threshold was calculated based on the GHG reduction goal established under SB 32 and EO B-30-15 (40 percent reduction below 1990 levels by 2030, taking into account the 1990 emissions levels adjusted for the AR4 global warming potentials for consistency with the rest of the inventory and the projected 2030 state wide population and employment levels).[7] Emissions in excess of the 2030 threshold of 2.7 MT of CO_2e per service population could impede attainment of statewide GHG reduction targets for 2030 established under SB 32. The 2030 assessment conservatively assumes full Project build-out by 2030, with 2030 emission factors.
- Project emissions in 2035 are also compared to a 2035 threshold of 2.1 MT of CO2e per service population. The 2035 threshold was calculated for 2035 and based on a linear projection toward 2050 reduction targets (2035 emissions would be 50% below 1990 emissions levels, and using the projected 2035 state wide population and employment levels).[8]

GHG Calculation Methodology

An evaluation was performed of the emissions inventory for the complete buildout of the development allowed under the proposed 2018 General Use Permit. Because California has adopted goals for reducing GHGs by 2030, the Project emissions inventory is based on the adopted 2030 regulatory measures and emission factors, assuming the total operational activity from complete buildout the proposed 2018 General Use Permit in 2030. If 2035 emission factors were used instead of 2030 emission factors, the total Project GHG emissions would be lower than reported in this EIR. Therefore, this EIR provides a conservative estimate of the anticipated 2035 Project emissions for comparison to a statewide goal established for year 2030.

Project GHG operational emissions include electricity use, natural gas use, mobile sources, emergency generator use, solid waste, and water supply and wastewater. GHG emissions from construction activities are also included. The study area inventory includes a number of direct and indirect sources of GHGs some of which are unique to Stanford operations which are summarized below.

Construction GHG Emissions

The average annual GHG emissions from construction activities under the proposed Project were based on construction and demolition square footage within the Project site from fiscal year 2001 through fiscal year 2015, and carried forward from 2018 to 2035; similar to that assumed in the air quality analyses (see Section 5.2, Air Quality). Construction off-road equipment and demolition emissions were calculated using the CalEEMod estimator model. Construction on-road vehicle emissions were calculated using EMFAC2014 and are included in the operational GHG emissions section because annual average on-road construction trips are incorporated in the traffic study. GHG emissions from construction phases would be largely attributable to fuel use from off-road construction equipment and vendor vehicles. Permanent vegetation changes that can occur as a result of land use development were also assumed resulting in a negligible change in GHG emissions for the Project.

7 The detailed derivation is shown in Table 5-1-2 of Appendix GHG.
8 The detailed derivation is shown in Table 5-1-3 of Appendix GHG.

Indirect GHG Emissions from Electricity Use

Indirect GHG emissions, which occur when electricity is used, would be typically due to electricity generation from offsite power plant locations. Electrical power to the Project site is supplied by PG&E, through the direct access program. Operational electricity emissions were based on usage estimates scaled up to account for the increased academic and academic support uses and student housing development by 2035. Electricity consumption for these uses was assumed to scale linearly, such that the efficiency of new buildings would be equal to current buildings. This is conservative, since newer buildings would be more energy efficient than older buildings as a result of anticipated increases in required conservation in future versions of Title 24 and other building codes. Electricity usage from the proposed 550 new faculty/staff homes were added to the inventory based on the CalEEMod default for condo/townhouses built to 2008 Title 24 standards, and adjusted to an approximation of 2016 Title 24 standards. This energy consumption is also conservative, as improved California Building Energy Efficiency Standards (Title 24, Part 6) are expected to require residences to achieve Zero Net Energy starting with 2019 Title 24. The additional increase in electricity consumption was also assumed to incorporate increases in electrical demand for charging electric vehicles. Electricity usage from the Escondido Village Graduate Residences, which will be occupied after 2018, was added to the inventory using the same methodology as the new faculty/staff homes except starting with the CalEEMod default for the mid-rise apartment land use. Year 2035 electricity intensity factors for Project emissions are based on the assumption that PG&E and other energy providers to Stanford achieve the State's SB 350-mandated goal of acquiring 50 percent of energy from renewable sources by 2030 (CEC, 2016). In addition, electrical GHG emissions assume that the Stanford Solar Farm and on-site solar generation will continue to produce renewable electricity through 2035.

Natural Gas Combustion GHG Emissions

GHG emissions from natural gas combustion would be generated from residential and commercial usage (e.g., cooking and heating) and industrial usage (i.e., powering the new CEF and Replacement Process Steam Plant). Natural gas combustion emissions are based on natural gas consumption estimates scaled up to account for the increased academic and academic support uses and student housing development by 2035. As with electricity consumption discussed above, natural gas consumption for these uses was conservatively assumed to scale linearly, such that the efficiency of new buildings would be equal to current buildings. Natural gas consumption from the proposed 550 new faculty/staff homes was also added to the inventory using the conservative 2008 Title 24 standards, similar to that used for the electricity emissions estimates.

Mobile Sources

GHG emissions associated with on-road mobile sources would be generated from residents, workers, visitors, and delivery vehicles visiting the various land use types at Stanford. Mobile source emissions include running exhaust emissions, idling exhaust emissions, and starting exhaust tailpipe emissions. The USEPA-approved EMFAC2014 was used to generate the GHG emission factors for each type of fleet. Vehicle trip generation and/or VMT data for off-campus trips, on-campus trips, and vendors were based on information developed for the analysis presented in Section 5.15, Transportation and Traffic (also see Appendix VMT). On-road campus

fleet emissions account for the proposed electrification of all of Stanford's Marguerite bus fleet and 70 percent of its Lands, Buildings and Real Estate (LBRE) and Bonair vehicle fleets by 2035.

Emergency Generators

GHG emissions from emergency generators would be from diesel combustion resulting from their operation for testing and maintenance and for emergency operation. Emergency generator operational data (hours of operation, including some emergency usage) from 2018 was scaled up to account for the increase in academic and academic support uses in 2035. A representative GHG emission factor (in grams per horsepower per hour) was used for emergency generators based on a default fuel consumption rate.

Waste Disposal

Indirect GHG emissions associated with waste disposal would include CH_4 generation from the decomposition of waste and the CO_2 emissions associated with the combustion of CH_4. Waste generation was assumed to linearly increase based on the increase in academic and academic support square footage to full buildout in 2035. Waste associated with the proposed new faculty/staff housing is added based on the 2015 per-house waste disposal rates, and waste associated with the new Escondido Village Graduate Residences is added based on the CalEEMod default disposal rate for mid-rise apartments. Waste disposal was assumed to scale linearly, such that disposal rates in new buildings would be equal to current buildings. The diversion rate was assumed to remain constant from the 2015 rate, even though diversion rate state wide is expected to increase by 2035. GHG emissions associated with non-landfill diverted waste streams were not considered because these diversions would not result in any appreciable amounts of GHG emissions when operated effectively. Biogenic CO_2 emissions were not included when CARB analyzed the GHG emissions inventory under AB 32. Therefore, they were not included in the emissions inventory.

Water and Wastewater Conveyance and Treatment

Indirect GHG emissions would result from the production of electricity used to convey, treat, and distribute water and wastewater. Stanford's potable water is sourced from the San Francisco Public Utilities Commission; and non-potable water comes from groundwater and surface water. Additional emissions from wastewater treatment include CH_4 and N_2O, which are emitted directly from the wastewater. Adjusted Year 2035 water use rates from the Project Water Supply Assessment included in Appendix WSA were used.[9] Wastewater generation was assumed to increase at the same overall rate as domestic water use.

Miscellaneous Sources

In addition to the main inventory items described above, miscellaneous GHG sources were also added based on Stanford Office of Sustainability estimates for propane and acetylene combustion, as well as the HFCs used in fire suppression.

[9] Year 2035 water rates were adjusted in the GHG analysis to not include the water use from Stanford faculty and staff houses located outside of the study area.

Impact Evaluation

Impact 5.7-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a cumulatively considerable contribution to global climate change. (*Less than Significant*)

As discussed under GHG Calculation Methodology above, an evaluation was conducted of the emissions inventory for the complete buildout of the development allowed in the study area under the proposed 2018 General Use Permit. Project GHG operational emissions include electricity use, natural gas use, mobile sources, emergency generator use, solid waste, and water supply and wastewater; as well as GHG emissions from construction activities.

The total estimated GHG emissions in 2035 in the study area with buildout of the proposed 2018 General Use Permit are presented in **Table 5.7-2**, below. Development and growth under the proposed 2018 General Use Permit would emit a total of approximately 125,412 $MTCO_2e$ of GHG emissions per year in 2035. The dominant GHG emissions sources would be almost evenly distributed between transportation, electricity imported to campus, and natural gas which contribute 34 percent, 30 percent, and 30 percent of the total inventory, respectively. This GHG emission rate compares closely that of the 2018 baseline emissions presented in Table 5.7-1, which are estimated at 125,672 $MTCO_2e$ per year.

The proposed Project would not result in a net increase in campus-wide GHG emissions over that generated in the 2018 environmental baseline. While the proposed 2018 General Use Permit would result in additional development and a larger population, the relative stability of emissions between 2018 and 2035 is primarily due to increased efficiency associated with cleaner electricity and cleaner mobile vehicles. Furthermore, as discussed above, the 2035 Project inventory was conservatively developed using 2030 emission factors. As a result, the electricity intensity factor, mobile emission factors, and other GHG sources are expected to continue to decrease after 2030 to meet California's long-term GHG reduction goals.

The proposed Project would result in emissions of 1.8 MT of CO_2e per service population. This is below the 2.7 MT of CO_2e per service population threshold to determine consistency with the reduction goals established under SB 32 and EO B-30-15 for year 2030. The proposed Project's emissions of 1.8 MT of CO_2e per service population would also be below the 2.1 MT of CO_2e per service population threshold significance criterion developed for determining the GHG reduction trajectory toward 2050.

The total GHG emissions under the proposed 2018 General Use Permit would be at or below those GHG emissions under the 2018 baseline. Further, GHG emissions under the proposed 2018 General Use Permit would be below the significance thresholds that relate to consistency with GHG reduction goals for year 2030 and, to the extent feasible, year 2050. The proposed Project would not generate GHG emissions, either directly or indirectly, that would make a cumulatively considerable contribution to a significant impact on global climate change. Thus, this impact is less than significant.

Mitigation: None required.

TABLE 5.7-2
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF THE 2018 GENERAL USE PERMIT

GHG Source	GHG Emissions (metric tons CO2e per year)
Electricity	
PG&E Commercial	27
PG&E Searsville/Olmstead	37
New Faculty/Staff Housing	279
Direct Access	454
Imported to Campus and CEF	35,628
Non-Stanford Commercial	419
Subtotal	**36,844**
Natural Gas	
PG&E Residential	4,281
PG&E Commercial	20,559
PG&E Searsville/Olmstead	71
New Faculty/Staff Housing	347
Hot Water Generators	7,104
Replacement Process Steam Plant	5,770
Subtotal	**38,131**
Mobile Sources	
Worker Trips	15,524
Resident Trips	14,222
Campus Vehicles On-road	1,170
Campus Vehicles Off-road	235
Other Trips	11,767
Subtotal	**42,919**
Emergency Generators	
Subtotal	**444**
Solid Waste	
Subtotal	**5,286**
Water Transport and Treatment	
Domestic Water Use	320
Wastewater Treatment	121
Direct Wastewater Emissions	633
Subtotal	**1,074**
Miscellaneous Sources	
On-Campus Research and Fire Suppression	294
Construction Equipment	420
Subtotal	**714**

TABLE 5.7-2 (CONTINUED)
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF THE 2018 GENERAL USE PERMIT

GHG Source	GHG Emissions (metric tons CO2e per year)
Total GHG Emissions 2035 with Buildout of the 2018 General Use Permit	**125,412**
Service Population	**68,781**
Emissions per Service Population	**1.8**
2030 Service Population Threshold	**2.7**
Exceeds 2030 Threshold?	**No**
2035 Service Population Threshold based on progress to 2050	**2.1**
Exceeds 2035 Threshold?	**No**

NOTES: The service population, comprised 49,428 workers, 19,353 residents and 17,116 workers who are residents, as derived from population estimates the SB 743 VMT Analysis prepared by Stanford in support of its 2018 General Use Permit (Appendix VMT).

SOURCE: Ramboll Environ, 2017.

Impact 5.7-2: The Project could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*Potentially Significant*)

Assembly Bill 32

The primary goal of AB 32 is the requirement for statewide GHG emissions to be reduced to 1990 levels by 2020. BAAQMD developed an efficiency metric of 4.6 MT of CO_2e per service population or less as indicative of a proposed plan or mixed use development as sufficient for achieving the year 2020 of AB32 (BAAQMD, 2009). As indicated in Table 5.7-2, Project emissions would be well below this efficiency metric. Thus, the proposed Project would not conflict with the primary goal of AB 32.

AB 32 also required the adoption of discrete Early Action Measures Items[10] which resulted in the development of the Low Carbon Fuel Standard, among other things. Further, AB 32 required the development of a Scoping Plan for achieving the necessary GHG reductions in a technologically and economically feasible manner, the adoption of a mandatory GHG emissions reporting regulation, and the establishment of a market-based declining emission limit program (i.e., the cap-and-trade program). Each of these programs is discussed below.

[10] CARB. 2007. Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration. Available online at: https://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf

CARB Scoping Plan

The AB 32 Scoping Plan identifies over 70 measures for reducing greenhouse gas emissions to 1990 levels by 2020. Specific measures discussed in the Scoping Plan that are relevant to the proposed Project include the Renewables Portfolio Standard (RPS) and Advanced Clean Cars program.

The RPS requires retail sellers of electricity to achieve 33 percent renewable energy sources by 2020. While Stanford is not a regulated entity under the RPS, the electricity that Stanford purchases reflects the use of renewable sources as required to comply with the RPS.

As discussed in the Environmental Setting, notable recent changes to Stanford's energy systems have occurred, including an overhaul of its campus heating and cooling system, resulting in large reductions of GHG emissions, fossil fuel use, and campus-wide water use. In addition, Stanford recently began procuring approximately 159,000 MWh/year of electricity from its Solar Generating Station in Kern County and an additional 7,300 MWh/year will be generated from on-campus rooftop solar installations; together, these solar systems will provide half of the campus' electricity demand. In combination with the renewable sources that utilities must use to comply with the RPS, the anticipated total percentage of Stanford's electricity from renewable sources will be over 65 percent.

The Advanced Clean Cars Program applies to vehicle manufacturers. While Stanford is not a regulated entity under this regulation, the vehicles used by Stanford employees, residents, and contractors will reflect the GHG emission limits required by the regulation. Implementation of these regulations, combined with low carbon fuel standards (LCFS) will reduce the campus's vehicular GHG emissions on a per service population basis. Additional emissions reductions would result from Stanford's proposes electrification of all its Marguerite bus fleet and 70 percent of its LBRE and Bonair vehicle fleets by 2035 under the Project. Consequently, through its past and ongoing proactive actions, and with implementation of the proposed 2018 General Use Permit, Stanford would be consistent with elements of the Scoping Plan relevant to its operations.

As a result of conformance to the Renewables Portfolio Standard (RPS) and Advanced Clean Cars program, the proposed Project would not conflict with the CARB Scoping Plan.

Plan Bay Area

MTC estimates increases in both residents and workers at Stanford in its 2040 growth projections under Plan Bay Area. MTC model Traffic Analysis Zones (TAZs) that include the Project site were reviewed for both 2015 and 2040. The MTC land use data shows 2040 growth projections under the Regional Transportation Plan (RTP) and SCS increase in both residents (14 percent) and jobs (28 percent) for those TAZs. The proposed Project is consistent with the SCS in terms of proposing additional residences and academic square footage in locations specified in the SCS for such development. In addition, the VMT Analysis presented in Section 5.15, Transportation and Traffic (see also Appendix VMT) indicates that the proposed Project would generate VMT per worker and VMT per capita rates that are more than 15 percent below the regional averages.

The proposed 2018 General Use Permit is consistent with the SCS in terms of proposing additional land use in locations where the SCS contemplates development.

Predicted VMT rates would be largely due to proximity to transit and Stanford's existing and proposed Travel Demand Management (TDM) programs. Over time, as the TDM programs have expanded, the drive alone rate of Stanford commuters has decreased to approximately 50 percent. This decrease in solo drivers directly reduces the number of vehicle trips to the campus and VMT. Because the proposed 2018 General Use Permit would locate residents and workers where envisioned by the SCS, and would generate less than 85 percent of the VMT per capita and VMT per worker compared to the existing regional averages, it would not conflict with the regional goals and targets expressed in the *Plan Bay Area Sustainable Communities Strategy.*

Executive Order B-30-15 and SB 32

Executive Order B-30-15 established a GHG emission reduction goal for California of 40 percent below 1990 levels by 2030. This Executive Order also directed all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in Executive Order S-3-05. Additionally, the Executive Order directed CARB to update its Scoping Plan to address the 2030 goal. SB 32 codifies the 2030 emissions reduction goal of Executive Order B-30-15 requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

The GHG emissions total presented in Table 5.7-2 conservatively represents the emissions inventory for the proposed Project at full build-out in 2035. As explained in the preceding impact analysis, the proposed Project emissions would be below the 2030 service population target calculated based on the GHG reduction goal established under SB 32 and EO B-30-15 (40 percent reduction below 1990 levels by 2030, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Several regulatory requirements that would reduce emissions as a result of development and growth pursuant to the proposed Project would be consistent with achievement of the State's 2030 GHG target, including the following:

- SB 350 requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 50% by 2030 (from 33% by 2020).
- Under SB 375, ARB adopted Regional Targets of 15% for 2035 for the area under ABAG's jurisdiction, which includes Stanford. The MTC and ABAG approved the final Plan Bay Area, which establishes strategies for meeting the Bay Area's Regional Targets.
- The Advanced Clean Cars Program will reduce GHG emissions by nearly 35% for new cars of model years 2017-2025.
- CPUC, CEC, and ARB have a shared, established goal of achieving zero net energy (ZNE) for new residential construction by 2020 and new commercial construction by 2030.
- Executive Order B-16-12 sets targets for State zero-emission vehicle (ZEV) infrastructure to be able to support one million vehicles by 2020; 1.5 million zero-emission vehicles to be on the road, displacing 1.5 billion gallons of petroleum fuels, by 2025; and an 80% reduction of GHG emissions from the transportation sector by 2050, compared to 1990

levels. At least 10 percent of California state fleet purchases of light-duty vehicles must be zero-emission by 2015, and at least 25 percent of fleet purchases of light-duty vehicles must be zero-emission by 2020.

The measures above are intended to ensure that the State meets the 2030 GHG target. The proposed Project would not conflict with these initiatives and regulatory requirements, and Stanford's GHG emissions under the proposed 2018 General Use Permit would be below the efficiency metric threshold derived for year 2030 reduction goals.

Executive Order S-3-05

Executive Order No. S-3-05 established a goal of reducing the State's GHG emissions to 80 percent below the 1990 level by the year 2050. Based on existing emissions trends, the proposed Project's emissions are expected to decline from 2030 through at least 2050 due to continued regulatory and technological advancements. The proposed Project emissions would be lower than the service population target calculated for 2035 based on the trajectory needed to achieve the GHG reduction goal established under EO S-3-05 (80 percent reduction below 1990 levels by 2050, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Therefore, the proposed Project would not conflict with the attainment of the State's long-term GHG reduction goal for 2050.

Energy efficiency and reduced VMT will play important roles in achieving the goal of EO S-3-05, but technological improvements including decarbonization of fuel will also be necessary. The extent to which GHG emissions from mobile sources indirectly attributed to the proposed Project would change in the future depends on the quantity (e.g., number of vehicles, average daily mileage) and quality (i.e., carbon content) of fuel that would be available and required to meet both regulatory standards and resident and worker needs. In addition, renewable power requirements, LCFS, and vehicle emissions standards discussed above will all decrease GHG emissions per unit of energy delivered or per VMT. Due to the technological shifts required and the unknown parameters of the regulatory framework in 2050, further quantitatively analyzing the proposed Project's impacts relative to the 2050 target would be speculative for purposes of CEQA.[11] Section 15145 of the State CEQA Guidelines directs that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

While it would be speculative to quantitatively estimate the Project's emissions level in 2050 and to assess the impact to the 2050 horizon-year goal set in EO S-3-05, statewide efforts are underway to facilitate the State's achievement of that goal and it is reasonable to expect the proposed Project's GHG emissions level to decline as the regulatory initiatives identified by CARB in the 2014 update to the Scoping Plan are implemented, and other technological innovations occur. Given the reasonably anticipated decline in proposed Project emissions once fully constructed and operational, the Project would not conflict with the 2050 horizon-year goal of EO S-3-05.

[11] Studies have shown that, in order to meet the 2050 target, aggressive technology changes in the transportation and energy sectors, such as electrification and maturation of technologies still in development (e.g., advanced batteries and more efficient biofuels), will be required (LBL, 2011). One recent study indicated that, even with these emerging technologies, the 2050 goal will not be met, due to the population growth to 55 million by 2050.

BAAQMD 2017 Clean Air Plan

The 2017 Clean Air Plan contains transportation measures and measures related energy, green building, waste management, water control of short-lived GHGs. Those Clean Air Plan measures applicable to the Project are identified in **Table 5.2-11** in Section 5.2, Air Quality. Table 5.2-11 provides a brief description of the control measure and identifies any existing or proposed mechanism that Stanford and surrounding local jurisdictions and transit agencies would have in place to implement these measures. Existing mechanisms or those included in the proposed 2018 General Use Permit would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. Because there are some control measures with which the Project as proposed may not be consistent, this impact is considered potentially significant. Where an implementation mechanism does not currently exist or is not identified in the proposed 2018 General Use Permit, mitigation measures are identified in this EIR to ensure its consistency with the 2017 Clean Air Plan.

County of Santa Clara General Plan

In 2015, the County of Santa Clara adopted a new Health Element of the General Plan. The Health Element contains five policies that may be interpreted to address climate change and GHG emissions. The first of these is Policy HE-G.5, which directs the County to support efforts to reduce transportation-related GHG emissions. The proposed 2018 General Use Permit addresses this policy by Stanford's continued implementation of its TDM programs which are designed to achieve the Stanford Community Plan's No Net New Commute Trips standard. As demonstrated in the VMT analysis presented in Section 5.15, Transportation and Traffic (see Appendix VMT), per capita and per worker VMT would be lower than 15 percent below the regional average with development and growth under the proposed 2018 General Use Permit. The VMT reductions would be achieved through Stanford's transportation services, travel demand management programs, and on-campus housing and low-carbon fleets. More specifically, as discussed in the Project Description, under the proposed 2018 General Use Permit, Stanford would electrify all Marguerite buses by 2035 which would further reduce transportation-related GHG emissions. Consequently, the proposed Project would be consistent with Policy HE-G.5 of the County's Health Element of the General Plan.

Policy HE-G.10 directs the County to promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions, and Policy HE-G.17 directs the County to promote energy retrofits and increase extreme heat resiliency for housing. Development under the proposed 2018 General Use Permit would address these policies through implementation of Stanford's Climate and Energy Plan, which sets forth high-performance, whole-building energy performance targets specifically for each new building. These requirements would ensure that development under the 2018 General Use Permit would be consistent with Policies HE-G.10 and HE-G-17.

Policy HE-G.11 directs the County to encourage renewable energy, such as solar and wind turbines on commercial, industrial and residential buildings. As discussed previously, under the SESI, Stanford updated its campus-wide energy system, replacing a 100 percent fossil fuel-based cogeneration power plant with grid-sourced electricity and an advanced heat recovery system. In addition, as explained above, Stanford recently began procuring electricity from its Solar

Generating Station in Kern County and will be generating additional electricity from its on-campus rooftop solar installations, which together would provide half of the campus's electricity demand. Development under the proposed 2018 General Use Permit would be powered and heated via these renewable energy sources, and hence would implement the intent of Policy HE-5.11.

Policy HE-G.16 directs the County to implement heat island mitigation by supporting urban greening and the use of green infrastructure to minimize the urban heat island effect. Stanford's Guidelines for Sustainable Buildings includes strategies for using microclimate and environmentally responsive design. These include designing sites to reduce "heat island" effects, such as using shading opportunities, use of high albedo materials; and pervious surfaces for parking, walkways, plazas, etc., and permeable paving for roads with infrequent use (e.g., fire roads). Other strategies include locating trees and shrubs to complement cooling in outdoor spaces and buildings and to create seasonally appropriate heatsinks and natural ventilation corridors. Implementation of these strategies would make the proposed Project consistent with Policy HE-G.16.

Summary

The proposed 2018 General Use Permit would meet or better the emissions reduction targets presented in this report for 2030 and 2035. Because many aspects of the proposed Project's emissions inventory would benefit from further regulatory and technological advancements, the proposed Project would not obstruct the attainment of the State's long-term GHG reduction goal for 2050. The proposed Project would not result in a net increase in GHG in 2035 compared to the existing 2018 baseline. In addition, Stanford's actions to implement energy efficiency over the past five years have resulted in a substantial reduction in GHG emissions between 2014 and the 2018 environmental baseline (see Appendix GHG).

Development and growth pursuant to the proposed 2018 General Use Permit, along with Stanford's existing policies and programs, would potentially conflict with control measures of the 2017 Clean Air Plan, a policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Implementation of mitigation measures identified below would ensure the proposed 2018 General Use Permit would achieve consistency with the 2017 Clean Air Plan, and therefore, the proposed Project's impacts are less than significant with mitigation.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 5.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 5.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Climate change is the cumulative effect of all natural and anthropogenic sources of GHGs accumulated on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change, and thus the assessment of GHG emissions impacts is inherently cumulative.

The analysis in Impact 5.7-1 uses the BAAQMD CEQA Guidelines service population metric to assess the significance of the project's contribution to cumulative global GHG emissions. Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to particular global climate changes.

Both BAAQMD and the California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate. (BAAQMD, 2012; CAPCOA, 2008). Therefore, the evaluation of cumulative GHG impacts presented above evaluates whether the proposed 2018 General Use Permit would make a considerable contribution to cumulative climate change effects.

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5.8 Hazards and Hazardous Materials

5.8.1 Introduction

This section addresses the potential for exposure to hazards and hazardous materials as a result of construction activities and campus operations under the proposed 2018 General Use Permit. This section includes a description of the existing and 2018 baseline environmental settings related to the use, handling (including transport and disposal), and storage of hazardous materials; emergency response planning; and wildland fire management at the Project site, and presents a discussion of applicable federal, State, and County regulations governing these activities. This section then evaluates potential impacts of the proposed Project and identifies regulatory mechanisms and/or feasible mitigation measures to ensure potentially significant impacts associated with hazards and hazardous materials would be minimized.

5.8.2 Existing Environmental Setting

Hazardous Materials

Definitions

Materials and waste are generally considered hazardous if they are poisonous (toxicity), can be ignited by open flame (ignitability); corrode other materials (corrosivity), or react violently, or explode or generate vapors when mixed with water (reactivity). The term "hazardous material" is defined in the State Health and Safety Code (Chapter 6.95, Section 25501[o]) as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.

A "hazardous waste," for the purpose of this EIR, is any hazardous material that is abandoned, discarded, or recycled, as defined in the State Health and Safety Code (Chapter 6.95, Section 25125). The use, handling, and storage of hazardous materials, as well as the potential releases of hazardous materials to the environment, are regulated through many local, state and federal laws.

Medical and biological waste can also be considered a hazardous waste and is generated or produced as a result of diagnosis, treatment, or immunization of human beings or animals and the production or testing of biological materials. Generally, medical waste can be classified as either a biohazardous waste or a sharps waste.[1,2] Cultures, blood and blood products, tissues, and body parts are all considered medical waste. The transportation and disposal of medical waste is closely

[1] The term "biological materials" means medicinal preparations made from living organisms and their products, including but not limited to, serums, vaccines, antigens and anti-toxins.

[2] The term "sharps waste" refers to any device having acute rigid corners, edges, or proturbences capable of cutting or piercing, including, but not limited to, hypodermic needles and broken glass items (such as pipettes and vials) contaminated with biohazardous waste.

regulated under Section 118215 of the California Medical Waste Management Program.[3] In addition, operation of airborne medical transport can also pose a risk to human health and safety.

Radioactive decay (also known as nuclear decay or radioactivity) is the process by which an unstable atomic nucleus loses energy by emitting radiation. A material containing such unstable nuclei is considered radioactive. Radioactive material waste includes any items containing measurable radioactivity.

Potential Receptors/Exposure

The sensitivity of potential receptors in the areas of known or potential hazardous materials contamination is dependent on several factors, the primary factor being the potential pathway for human exposure. Exposure pathways include external exposure, inhalation, and ingestion of contaminated soil, air, water, or food. The magnitude, frequency, and duration of human exposure can cause a variety of health effects, from short term acute symptoms to long-term chronic effects. Potential health effects from exposure can be evaluated in a health risk assessment. The principle elements of exposure assessments typically include:

- Evaluation of the fate and transport processes for hazardous materials at a given site;
- Identification of potential exposure pathways;
- Identification of potential exposure scenarios;
- Calculation of representative chemical concentrations; and
- Estimation of potential chemical uptake.

Hazardous Building Materials

Development projects often involve the need to demolish existing older structures or excavate previously developed property. Many older buildings contain building materials that consist all or in part of hazardous materials, which can be hazardous to people and the environment once disturbed. Some of the most common of these hazardous materials include lead-based paint (LBP), asbestos-containing materials (ACM), and polychlorinated biphenyls (PCBs).

Lead and Lead-Based Paint (LBP)

Prior to the U.S. Environmental Protection Agency (USEPA) ban in 1978, LBP was commonly used on interior and exterior surfaces of buildings. Through such disturbances as sanding and scraping activities, or renovation work, or gradual wear and tear, old peeling paint, or paint dust particulates have been found to contaminate surface soils or cause lead dust to migrate and affect indoor air quality. Exposure to residual lead is known to cause severe adverse health effects, especially in children. Waste soil containing lead is classified as hazardous if the lead exceeds a total concentration of 1,000 parts per million (ppm) and a soluble concentration of 5 ppm [Title 22 of the California Code of Regulations (CCR) Section 66261.24]. Hazardous soil would be subject to the regulations for hazardous waste transport and disposal described below.

[3] California Medical Waste Management Act, California Health and Safety Code Sections 117600-118360.

Asbestos

Asbestos is a naturally-occurring fibrous material that was extensively used as a fireproofing and insulating agent in building construction materials before such uses were banned by the USEPA in the 1970s. ACM were commonly used for insulation of heating ducts as well as ceiling and floor tiles to name a few typical types of materials. Similar to LBP, ACM fixed within the building materials present no significant health risk because there is no exposure pathway. However, if these tiny fibers are disturbed, they can become airborne and become a respiratory hazard. The fibers are very small and cannot be seen with the naked eye. Once they are inhaled, they can become lodged into the lungs potentially causing lung disease or other pulmonary complications.

The San Francisco Bay Area Air Quality Management District (BAAQMD) is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement (see *Regulatory Setting,* below, for regulations regarding asbestos removal).

Polychlorinated Biphenyls (PCBs)

PCBs are organic oils that were formerly used primarily as insulators in many types of electrical equipment including transformers and capacitors. After PCBs were determined to be a carcinogen in the mid- to late-1970s, the USEPA banned PCB use in most new equipment and began a program to phase out certain existing PCB-containing equipment. Fluorescent lighting ballasts manufactured after January 1, 1978, do not contain PCBs and are required to have a label clearly stating that PCBs are not present in the unit.

Mercury

Elemental mercury waste is considered hazardous. Spent fluorescent light tubes, thermostats, and other electrical equipment contain heavy metals such as mercury that, if disposed of in landfills, can leach into soil or groundwater. Lighting tubes typically contain concentrations of mercury that may exceed regulatory thresholds for hazardous waste and, as such, must be managed in accordance with hazardous waste regulations. Mercury can also be present in traps in the plumbing of older buildings in which mercury-containing equipment has been used.

Soil and Groundwater Contamination

Facilities that use, store, and dispose of hazardous materials and wastes are required to contain, manage, and transport their hazardous materials in conformance with established local, State and federal regulations to ensure hazardous materials are not released to the environment to become a health hazard. Despite the rigor of the current regulatory environment, uses and practices existed prior to current regulations have resulted in releases of hazardous materials and wastes into the environment, in some cases causing contamination of the surface soil and groundwater.

Underground storage tanks (USTs), in particular, are a common contamination source in urbanized areas, and are even found on sites historically used for agriculture. Until the mid-1980s, most USTs were made of single-walled bare steel, which can corrode over time and result in leakage. Faulty installation or maintenance procedures have also lead to UST leakage, as well

as to potential releases associated with spills. Recently revised UST regulations have substantially reduced the frequency of incidents of leakage and consequential soil and groundwater contamination from new UST systems.

Project Site

The Project site includes a range of land uses that involve hazardous materials and waste transport, handling, and storage. According to a review of databases conducted for this analysis, the Project site includes case listings on both the Department of Toxic Substances Control (DTSC) Envirostor database and the State Water Resources Control Board (SWRCB) Geotracker database (DTSC, 2017, and SWRCB, 2017). On the Envirostor database, two cases are listed within the Academic Growth Boundary. These cases both predate the 2000 General Use Permit, and were closed in accordance with the applicable regulatory agency oversight and were determined to require no further action.

The Geotracker database includes a total of 19 cases, all of which are located within the Academic Growth Boundary (SWRCB, 2017). Of these 19 cases, 18 were closed in accordance with the applicable regulatory agency oversight and were determined to require no further action. The remaining case - at Building 260 - predates the 2000 General Use Permit, and is currently listed as inactive.[4,5]

Wildland Fire

A wildland fire is a fire in which the primary fuel is vegetation. The combination of highly flammable fuel, long dry summers and steep slopes create a substantial natural hazard of large wildland fires in many areas of the Bay Area. The wildland fire season in the Bay Area typically spans the months after the last spring rains have fallen and until the first fall or winter rain occur. Wildland fire hazards can be associated with areas where urban and wildland uses and activities interface. Fires ignited in wildland areas can quickly spread, if unabated, to areas where residential or commercial structures are intermingled with wildland vegetation. Furthermore, fires that start in urbanized areas can grow into wildland fires (County of Santa Clara, 2008).

The Project site encompasses a highly diverse landscape, ranging from the relatively developed campus within the Academic Growth Boundary, the foothills portion of the campus, riparian woodlands along Matadero Creek, Deer Creek and the creeks in the San Francisquito watershed, oak woodlands, chapparal and grasslands in the foothills. County of Santa Clara designates areas within the Academic Growth Boundary as non-wildland/non-urban, and designates the foothills portion of the Project site as within a wildland/urban interface (County of Santa Clara, 2009). Based on mapping from the California Department of Forestry and Fire Protection (CAL FIRE), as compiled by the Association of Bay Area Governments (ABAG), the majority of the developed area within the Academic Growth Boundary is designated as a community at risk of

4 The case at Building 260 involved discovery of some degraded petroleum contamination potentially associated with a former fuel vault.

5 The SWRCB determines a numerical score for each case based on the threat to human health and the environment, economic considerations of cleanup, and community involvement/environmental justice. Cases that score at or below the 25th percentile are considered low priority and given an "inactive" status.

wildland fire, similar to large areas in proximity to the Project site within the adjacent jurisdictions (ABAG, 2017).

Santa Clara County's fire agencies maintain a countywide mutual aid agreement to ensure that firefighting resources and personnel will be available to combat wildland urban interface fires. If these resources are not enough to meet the threat, fire resources from throughout California can be summoned under the California Master Mutual Aid Agreement administered by the Governor's Office of Emergency Services (Cal OES). All fire agencies in Santa Clara County are also part of State's Master Mutual Aid Agreement and participate in mutual aid operations as required (County of Santa Clara, 2008).

Stanford regularly conducts fire control activities at the Project site, including the maintenance of fire breaks and vegetation control.

5.8.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation of the 2018 General Use Permit would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the Project will be evaluated.

There are no changes related to hazards and hazardous materials anticipated to occur between the existing environmental setting described above and the 2018 baseline condition. Therefore, the conditions described above for the existing environmental setting are representative of the 2018 environmental baseline.

5.8.4 Regulatory Setting

Federal

The USEPA is the lead agency responsible for enforcing federal regulations that affect public health or the environment. The primary federal laws and regulations include the Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments enacted in 1984; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Act and Reauthorization Act of 1986 (SARA). Federal statutes pertaining to hazardous materials and wastes are contained in the CFR, Title 40 - Protection of the Environment. Federal statutes related to air quality, including toxic air contaminants, are presented in section 5.2, Air Quality. Federal statutes related to water quality, including drinking water quality, are presented in section 5.9, Hydrology and Water Quality.

Resource Conservation and Recovery Act (RCRA)

RCRA was adopted in 1976. RCRA Subtitle C regulates the generation, transportation, treatment, storage and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms per month or more) through comprehensive life cycle or "cradle to grave" tracking requirements. The requirements include maintaining inspection logs of hazardous waste storage locations, records of

quantities being generated and stored, and manifests of pick-ups and deliveries to licensed treatment/storage/disposal facilities. RCRA also identifies standards for treatment, storage, and disposal, which is codified in CFR Title 40 Part 260.

Comprehensive Environmental Response Compensation and Liability Act (CERCLA)

CERCLA, commonly known as Superfund, is the legal framework for the identification and restoration of contaminated property. In addition, CERCLA established prohibitions and other regulatory requirements concerning closed and abandoned hazardous waste sites, and provided for liability of persons or entities responsible for releases of hazardous waste at these sites. Generally, CERCLA authorizes two kinds of response actions: short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response, and long-term remedial response actions that permanently and significantly reduce the health risks associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening.

Emergency Planning Community Right-to-Know Act (EPCRA)

EPCRA, or SARA Title III, was enacted in October 1986. SARA Title III requires any infrastructure at the state and local levels to plan for chemical emergencies, including identifying potential chemical threats. Reported information is then made publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. EPCRA Sections 301 through 312 are administered by USEPA's Office of Emergency Management. USEPA's Office of Information Analysis and Access implements EPCRA's Section 313 program. The federal EPCRA program is implemented and administered in California by the California Governor's Office of Emergency Services (Cal OES), a State Emergency Response Commission (SERC), six Local Emergency Planning Committees (LEPCs), and 83 Unified Program Agencies (UPAs). Cal OES provides staff support to the SERC and the LEPCs.

Hazardous Materials Transportation Act

The transportation of hazardous materials is regulated by the Hazardous Materials Transportation Act (HMTA), which is administered by the Research and Special Programs Administration (RSPA) of U.S. Department of Transportation (USDOT). HMTA provides USDOT with a broad mandate to regulate the transport of hazardous materials, with the purpose of adequately protecting the nation against risk to life and property associated with the commercial transportation of hazardous materials. The HMTA governs the safe transportation of hazardous materials by all modes, excluding bulk transportation by water. RSPA carries out these responsibilities by prescribing regulations and managing a user-funded grant program for planning and training grants for states. USDOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, causes to be transported or shipped, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. USDOT regulations pertaining to the actual movement govern every aspect of the movement, including packaging, handling, labeling, marking, placarding, operational standards, and highway routing.

Occupational Safety and Health Administration

The U.S. Occupational Safety and Health Administration (OSHA) is the federal agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. Federal regulations pertaining to worker safety are contained in Title 29 of the CFR, as authorized in the Occupational Safety and Health Act of 1970. OSHA provides standards for safe workplaces and work practices, including standards relating to hazardous materials handling. See also discussion of the California Division of Occupational Safety and Health, below.

Asbestos

Federal and State laws and regulations pertain to building materials containing asbestos, which presents health risks described above. These existing laws and regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local governmental agencies prior to beginning renovation or demolition that could disturb asbestos.

Before renovating or demolishing buildings containing asbestos, contractors licensed to conduct asbestos abatement work must be retained. Asbestos abatement contractors must follow state regulations where there is asbestos-related work involving 100 square feet or more of asbestos containing material (8 CCR. Section 1529, Section 341.6 et seq.). BAAQMD and the California Division of Occupational Safety and Health (DOSH, or Cal/OSHA) must be notified 10 days prior to initiating construction and demolition activities. Asbestos encountered during demolition of an existing building must be transported and disposed of at an appropriate facility. The contractor and hauler of the material are required to file a Hazardous Waste Manifest which details the hauling of the material from the site and the disposal of it. Health and Safety Code Section 19827.5 precludes local agency issuance of a demolition or alteration permit until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos.

Polychlorinated Biphenyls (PCBs)

In 1979, the USEPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment. The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act (15 USC Section 2601 et seq.). This act and its implementing regulations generally require labeling and periodic inspection of certain types of PCB equipment and set forth detailed safeguards to be followed for disposal of such items.

Lead and Lead-Based Paint (LBP)

Regulations to manage and control exposure to lead-based paint are described in Title 29 of the CFR Section1926.62 and in Title 8 of the CCR Section1532.1. These regulations cover the demolition, removal, cleanup, transportation, storage and disposal of lead-containing material.

The regulations outline the permissible exposure limit, protective measures, monitoring and compliance to ensure the safety of construction workers exposed to lead-based material.

Biosafety Standards

A hazardous biologic material is any potentially harmful biologic material (including infectious agents, oncogenic viruses, and recombinant DNA) or any material contaminated with a potentially harmful biologic material. The National Institutes of Health and the Centers for Disease Control and Prevention operate under the U.S. Department of Health and Human Services and establish standards for working with biohazardous materials.

State

California Emergency Services Act

The California Emergency Services Act provides the basic authority for conducting emergency operations following a proclamation of emergency by the governor and/or appropriate local authorities. Local government and district emergency plans are considered to be extensions of the California Emergency Plan, established in accordance with the Emergency Services Act.

California Fire Code (CFC)

The CFC is found within Chapter 9 of the CCR Title 24. It is created by the California Building Standards Commission, and based on the International Fire Code (IFC), and contained within the California Building Code (CBC). It is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The CFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The CFC and the CBC use a hazard classification system to determine what protective measures are required to protect fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the CFC employs a permit system based on hazard classification and is implemented through County of Santa Clara Office of the Fire Marshal. The CFC is updated every three years.

California Unified Program

The California Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of several environmental and emergency response programs. The Unified Program Administration and Advisory Group (UPAAG) was created to foster effective working partnerships between local, State and federal agencies. The UPAAG's goals and objectives are listed in the UPAAG Strategic Plan. The applicable environmental and emergency response programs are:

- Hazardous Materials Business Plan (HMBP) Program;
- California Accidental Release Prevention (CalARP) Program;
- Underground Storage Tank (UST) Program;

- Aboveground Petroleum Storage Act (APSA) Program;
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (Tiered Permitting) Programs; and
- Hazardous Material Management Plans and Hazardous Material Inventory Statements (HMMP/HMIS)

The State agency partners involved in the Unified Program have the responsibility of setting program element standards, working with the California Environmental Protection Agency (Cal/EPA) on ensuring program consistency, and providing technical assistance to local certified unified program agencies (CUPAs).[6] The following State agencies are involved with the Unified Program:

- **Cal/EPA.** The Secretary of Cal/EPA is directly responsible for coordinating the administration of the Unified Program, and certifying CUPAs.
- **Department of Toxic Substances Control (DTSC).** The DTSC provides technical assistance and evaluation for the Tiered Permitting Programs. DTSC also regulates the generation, transportation, treatment, storage, and disposal of hazardous waste (see below).
- **Governor's Office of Emergency Services (Cal OES).** Cal OES is responsible for providing technical assistance and evaluation of the HMBP and CalARP Programs.
- **Office of the State Fire Marshal (OSFM).** The OSFM is responsible for ensuring the implementation of the HMMP/HMIS. These programs tie in closely with the HMBP Program.
- **State Water Resources Control Board (SWRCB).** The SWRCB provides technical assistance and evaluation for the UST Program in addition to handling the oversight and enforcement for the APSA program.

State / Regional Emergency Response Coordination

The State of California and local governments throughout the Bay Area, including the County of Santa Clara, have made investments in the planning and resources necessary to respond to natural and human-caused emergencies and disasters. Cal OES and its local government partners developed the Bay Area Regional Emergency Coordination Plan with support from the Department of Homeland Security to provide a framework for collaboration and coordination during regional events. The Regional Emergency Coordination Plan (RECP) has been prepared in accordance with national and state emergency management systems and plans. The RECP provides an all-hazards framework for collaboration among responsible entities and coordination during emergencies in the San Francisco Bay Area. The RECP defines procedures for regional coordination, collaboration, decision-making, and resource sharing among emergency response agencies in the Bay Area.

[6] As described below, the County of Santa Clara's Hazardous Materials Compliance Division of the Department of Environmental Health is the County's CUPA.

The RECP does not replace existing emergency response systems. Rather, it builds on the Standardized Emergency Management System (SEMS) and the California State Emergency Plan to provide methods for cooperation among Operational Areas and Cal OES, Coastal Region. The RECP provides linkages to ensure that existing Bay Area emergency response systems work together during the response to an event. In addition, the RECP complies with the requirements of the National Incident Management System (NIMS), and is consistent with the National Preparedness Goal.

SB 1889, Accidental Release Prevention Law/California Accidental Release Prevention Program (CalARP)

SB 1889 required California to implement a new federally mandated program governing the accidental airborne release of chemicals promulgated under Section 112 of the Clean Air Act. Effective January 1, 1997, CalARP replaced the previous California Risk Management and Prevention Program and incorporated the mandatory federal requirements. CalARP addresses facilities that contain specified hazardous materials, known as "regulated substances," that, if involved in an accidental release, could result in adverse off-site consequences. CalARP defines regulated substances as chemicals that pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive.

Department of Toxic Substances Control (DTSC) - Hazardous Waste Handling

DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely.

In California, the DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste in accordance with RCRA requirements. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management standards for hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Department of Toxic Substances Control (DTSC) -Transportation of Hazardous Materials in California

In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by the Department of Toxic Substances Control (DTSC). Statutory requirements governing hazardous waste transportation in California are contained in Division 20, Chapter 6.5, Article 6.5, Article 6.6, and Article 13 of the California Health and Safety Code (Health & Safety Code). Regulations adopted pursuant to these statutes are found in, Division 4.5, Chapter 13, and Chapter 29 of the CCR, Title 22. Hazardous waste transporters must comply with the California Vehicle Code, California Highway Patrol (CHP)

Regulations (CCR, Title 13); the California State Fire Marshal Regulations (CCR, Title 19); USDOT Regulations, Title 49, CFR; and USEPA Regulations, Title 40 CFR. All hazardous waste transporters and permitted treatment, storage and disposal facilities must have ID numbers, which are used to identify the hazardous waste handler and to track the waste from its point of origin to its final disposal ("From Cradle to Grave"). This number, issued by either USEPA (U.S. EPA ID Number) or by DTSC (California ID Number) depends on the type of waste [RCRA or non-RCRA (California only) wastes].

California Division of Occupational Safety and Health (Cal/OSHA)

In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations; Cal/OSHA standards generally are more stringent than federal regulations. State regulations concerning the use of hazardous materials in the workplace are included in Title 8 of the CCR, which contains requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees.

Medical Waste Management Act

The Medical Waste Management Act was adopted by the state legislature in 1990 and regulates the generation, handling, storage, treatment and disposal of medical waste. The Medical Waste Management Program ensures protection of public health and safety and the environment, through the implementation and enforcement of regulations that apply to the handling, storage, treatment, and disposal of biohazardous waste. The County of Santa Clara Department of Environmental Health (DEH) is responsible for implementing the Medical Waste Management Act, which is part of the California Health and Safety Code 117600-118360.

Radioactive Materials

Pursuant to the federal Atomic Energy Act, which requires states to assume responsibility for the use, transportation, and disposal of low-level radioactive material and for the protection of the public from radiation hazards, the Bureau of Radiological Health (BRH) of the California Department of Public Health administers the State's Radiation Control Law, which governs the storage, use, transportation, and disposal of sources of ionizing radiation (radioactive material and radiation-producing equipment). Radioactive material regulations require registration of sources of ionizing radiation, licensing of radioactive material, and protection against radiation exposure. The BRH also regulates the transportation of radioactive materials and disposal of radioactive waste. Users of radioactive materials must maintain detailed records regarding the receipt, storage, transfer, and disposal of such materials. State regulations concerning radioactive substances are included in 17 CCR. The regulations specify appropriate use and disposal methods for radioactive substances, as well as worker safety precautions and worker health monitoring programs.

County of Santa Clara

County of Santa Clara Office of Emergency Services

The County of Santa Clara Office of Emergency Services (County OES) is the lead agency for the County of Santa Clara under the SEMS, and the purpose of which is to prepare the County to respond efficiently and effectively to emergencies which threaten life, property, or the environment. The County OES administers an Emergency Operations Center (EOC) located in the Office of the Sheriff's building, from which centralized emergency management can be conducted. The EOC is activated by an on-call County OES Coordinator in the event of an emergency. Under such condition, the EOC supports and coordinates emergency response and recovery operations; coordinates and work with other appropriate federal, state and other local government agencies; and prepares and disseminates emergency public information, among other responsibilities.

In March 2008, the County of Santa Clara Board of Supervisors adopted the Santa Clara County Operational Area Emergency Operations Plan (EOP). The Santa Clara County Operational Area includes all incorporated cities, special districts, and the unincorporated area of the County. The EOP is an extension of the State's California Emergency Plan, and provides tasks, policies, and procedures for managing multi-agency and multi-jurisdictional emergency operations, public information functions and resource management. The EOP identifies a number of potential threats based upon a hazard analysis, including earthquakes, wildland urban/interface fire, extreme weather, public health emergency, technological and resource emergency, hazardous material incident, terrorism, floods and landslides.

In 2011, the County OES, with participation by 13 of the incorporated cities in the County, prepared the Santa Clara County Annex to 2010 Association of Bay Area Governments Local Hazard Mitigation Plan, Taming Natural Disasters. This serves as the County's Local Hazard Mitigation Plan pursuant to the State Disaster Mitigation Act of 2000. The document identifies the County-wide mitigation strategies to be implemented by the participating agencies in order to reduce hazard risk and increase resiliency throughout Santa Clara County.

County of Santa Clara Department of Environmental Health, Hazardous Materials Compliance Division

As the County's CUPA, the Santa Clara County Hazardous Materials Compliance Division (HMCD) of the Department of Environmental Health administers the following State-mandated environmental and emergency response programs:

- Hazardous Materials Business Plan (HMBP) Program;
- California Accidental Release Prevention (CalARP) Program;
- Underground Storage Tank (UST) Program;
- Aboveground Petroleum Storage Act (APSA) Program;
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (Tiered Permitting) Programs; and
- Hazardous Material Management Plans and Hazardous Material Inventory Statements (HMMP/HMIS)

County of Santa Clara Ordinances and Policies

Hazardous Materials Storage Ordinance (HMSO)

Hazardous Materials Storage

The County of Santa Clara regulates hazardous materials storage through County Ordinance Code Chapters XIII, Hazardous Materials Storage, and XV, Unified Program, in Division B11, Environmental Health. The HMSO was developed to protect human and environmental health through prevention and control of unauthorized discharges of hazardous materials. Under the HMSO, any facility storing a hazardous material is required to obtain and keep a current hazardous materials storage permit. Facilities handling hazardous materials must submit a HMBP or Hazardous Materials Registration Form, depending on the amount of hazardous materials stored.

The HMBP provides a mechanism for documentation of substantial amounts of hazardous materials. Facilities storing any hazardous materials at or above State-defined thresholds are subject to the HMBP program. The general thresholds are 55 gallons of a liquid, 200 cubic feet of a gas, and 500 pounds of a solid. As part of the HMBP, information on regulated activities, hazardous materials inventory, emergency response plan, and employee training plans are provided to the County HMCD. The HMBP must also include the monitoring methods to be used in each storage facility storing hazardous materials which are liquids or solids.

The HMSO also requires that Stanford provide appropriate emergency equipment and maintains post-emergency procedures for each location where hazardous materials are stored.

Toxic Gas Regulation

County Ordinance Code Chapter XIV, Division B11, Environmental Health, regulates toxic gases. The purpose of the ordinance is to prevent, control and respond to potentially dangerous conditions and to protect the public from acute exposure to toxic gas due to an accidental release. The ordinance applies to any material for which there is an established "Level of Concern," that is shipped in compressed gas cylinders and that acts as a gas upon release at normal temperature and pressure.

Medical Waste Management

County Ordinance Code, Chapter XII, Division B11, Environmental Health, regulates the management of the treatment and disposal of medical waste by empowering the Department of Environmental Health to implement the Medical Waste Management Act (Health and Safety Code Section 117600 et seq.). The Medical Waste Management Act, Division 104, Part 14, of the California Health and Safety Code regulates the storage, treatment, transportation and disposal of medical waste in the County of Santa Clara.

Santa Clara County General Plan

Safety and Noise Chapter

The Santa Clara County General Plan Safety and Noise Chapter contains the following strategies, policies and implementation actions with regard to hazards and hazardous materials:

Hazardous Materials

Strategy #1: Manage Hazardous Materials Safely and Efficiently.

Policy C-HS 14 - All feasible measures to safely and effectively manage hazardous materials and site hazardous materials treatment facilities should be used, including complying with all federal and state mandates.

Policy C-HS 15 - To achieve a more effective, efficient and economical regulatory environment, all feasible means to simplify and coordinate locally implemented hazardous materials management regulations should be considered.

Emergency Preparedness

Strategy #1: Plan for Immediate Disaster Response

Policy C-HS 18 - Local government, business, and community organizations should cooperate in preparing the most effective emergency response plans and procedures feasible.

Strategy #2: Plan for Post-Disaster Recovery

Policy C-HS 21 - Local emergency planning agencies should work to ensure continuity of government and a swift restoration of public and commercial services.

Policy C-HS 21 - Local emergency planning agencies should work to ensure continuity of government and a swift restoration of public and commercial services.

Policy C-HS 22 - Ensure that critical emergency services and equipment normally provided by outside agencies will be available in each jurisdiction to the extent possible (i.e., public health, mental health, coroner, fire suppression, etc.).

Stanford Community Plan

The Stanford Community Plan is an element of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

The Stanford Community Plan contains several strategies and policies relevant to hazards and hazardous materials:

Health and Safety

Hazardous Materials

The strategy for hazardous material management and its associated policies focuses on issues of oversight and emphasizes compliance with the existing array of regulations and laws governing hazardous materials. It also incorporates a broadly recognized need to find substitute materials and reduce volumes of hazardous materials as much as possible to reduce risk levels.

Strategy #6: Manage Hazardous Materials Safely and Efficiently.

Policy SCP-HS 12 - Employ all feasible measures to safely and effectively manage hazardous materials and wastes and to site hazardous wastes treatment facilities.

Policy SCP-HS 13 - Ensure compliance with all federal, state, and local regulations concerning hazardous waste management and disposal.

Policy SCP-HS 14 - Evaluate, as required under the California Environmental Quality Act, the potential health risks and effects of buildings proposed by Stanford in which hazardous materials will be used.

Policy SCP-HS 15 - Encourage the substitution of less hazardous materials and/or use of smaller volumes of hazardous materials, while maintaining amounts necessary to support University activities.

Implementation Recommendations:

SCP-HS (i)8 - Collaborate with Stanford and other regulatory agencies to develop appropriate standards for review of possible health risks from air emissions of future Stanford laboratory facilities.

SCP-HS (i)9 - Require the implementation of good laboratory practices to prevent release of odorous and toxic air contaminants.

SCP-HS (i)10 - Stanford shall provide adequate training for staff and students to segregate incompatible chemicals, use earthquake protection for chemical storage areas, and employ secondary containment.

SCP-HS (i)11 - Support Stanford's provision of an integrated waste management program to manage collection of chemical, radioactive and biomedical waste, and ensure environmentally protective disposal.

SCP-HS (i)12 - Prepare Risk Management Plans for compliance with California Accidental Release Prevention Laws as needed, or reduce/substitute quantities of materials to levels below that which requires such plan.

Emergency Preparedness and Response

This strategy and the associated policies emphasize a multifaceted approach to reduction of risk, emergency response, and recovery.

Strategy #7: Adequate Plan for Risk Reduction, Immediate Disaster Response and Post-Disaster Recovery.

Policy SCP-HS 16 - Coordinate with Stanford and local jurisdictions in both reducing general risk levels and preparing for emergency response.

Policy SCP-HS 17 - Stanford shall prepare and maintain effective and feasible emergency plans for disaster response and recovery.

Policy SCP-HS 18 - Consider emergency prevention and ability for emergency response in review of development projects on the campus with regard to access, seismic risks, flooding, fire, and other emergency issues.

Policy SCP-HS 19 - Stanford shall promote coordination at the neighborhood level and within campus student housing areas to achieve improved earthquake or other disaster preparedness and response capabilities.

Policy SCP-HS 20 - Stanford shall provide training and general public education for faculty, staff, and students regarding improved emergency preparedness and response.

Implementation Recommendations:

SCP-HS (i)13 - Periodically assess emergency preparation and recovery plans for adequacy.

SCP-HS (i)14 - Conduct emergency drills, training, and simulations on a periodic basis to enhance preparedness and make needed improvements to emergency response plans.

Stanford

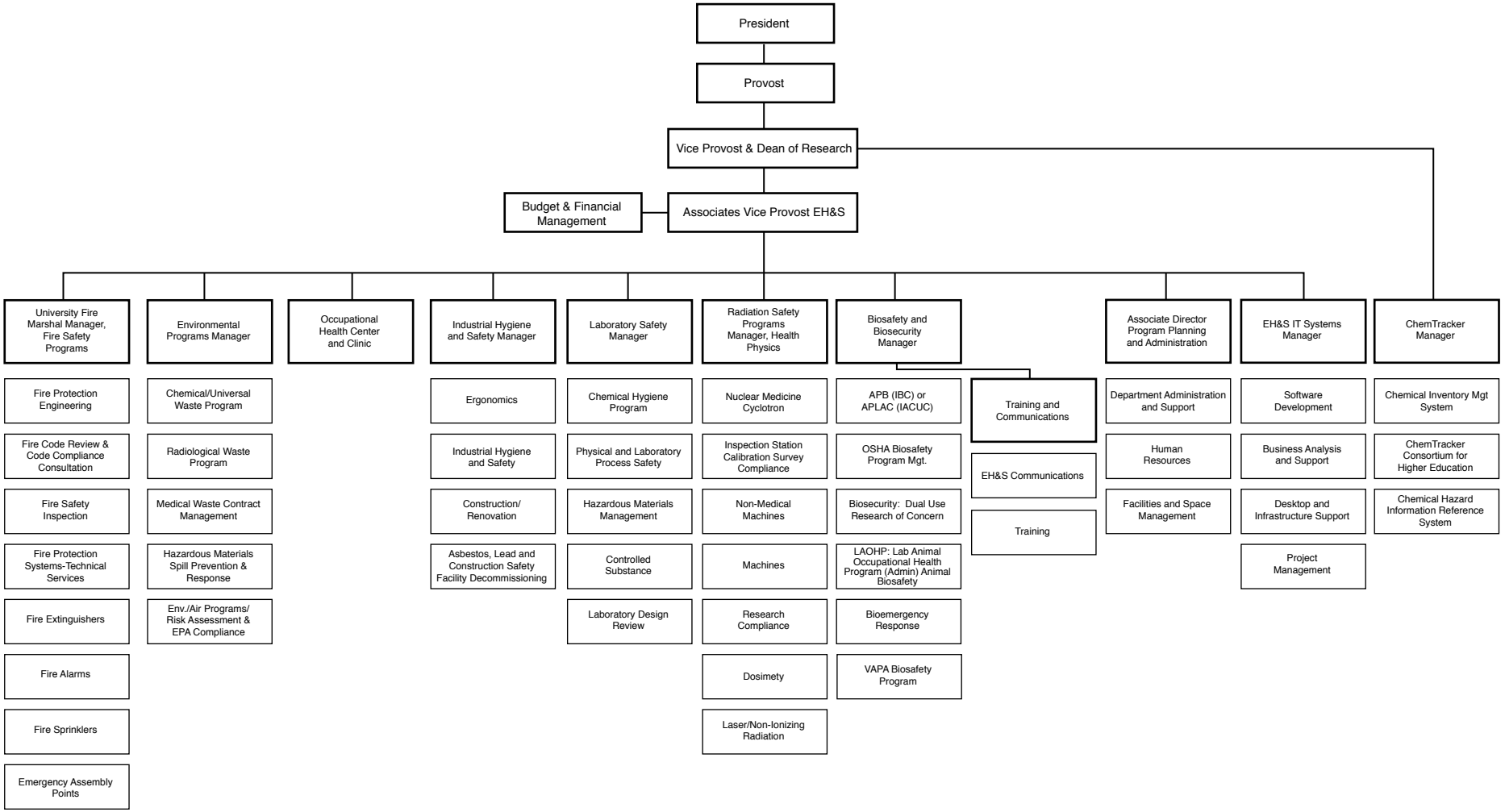
As a major institution located in multiple jurisdictions, Stanford has established a framework and infrastructure for the oversight and management of hazards and hazardous materials on the campus, including compliance with federal, State, and local regulations and laws.

Stanford Department of Environmental Health and Safety

The Stanford Department of Environmental Health and Safety (EH&S) is responsible for day-to-day management of health and safety operations at Stanford, including the management of hazardous materials and hazardous wastes. The EH&S Department also develops and recommends health and safety policies; approval of any such policies rests with other University bodies, such as the University Committee on Health and Safety, the Faculty Senate Committee on Research and others. EH&S works closely with the University Safety Partners (described below); faculty, researchers, and associated managers and staff; safety coordinators and safety committees; and campus administrators. An organizational chart for Stanford EH&S is presented in **Figure 5.8-1**.

The EH&S Department operates a multitude of programs that address hazardous materials issues and compliance matters associated with chemical, biological and radiation safety. These include programs for hazardous materials management, laboratory safety, biosafety, safety engineering, industrial hygiene and safety, fire safety, radiation safety and health physics. In addition, EH&S operates environmental programs for management of chemical waste, radiological waste, medical waste, hazardous materials spills prevention and response, and risk assessment.

Stanford's Toxic Gas User's Handbook addresses the proper handling of toxic gases at Stanford. The Handbook covers the general requirements of the County's Toxic Gas ordinance, which include seismic protection, security, leak testing, separation of incompatibles, protective plugs/caps, emergency drills, fire extinguishing systems, and annual maintenance. EH&S provides assistance to help Stanford personnel determine whether the gases they use are regulated under the ordinance and, if so, what procedures must be followed to properly handle and manage them.



SOURCE: Stanford, 2017

Stanford 2018 General Use Permit . 160531

Figure 5.8-1
Stanford Department of Environmental Health and Safety Organization

EH&S provides key resources in the planning, development and implementation of environmental and health and safety training programs. EH&S also conducts routine surveys of campus laboratories and facilities to ensure compliance with regulatory requirements in the transport, use, storage and disposal of hazardous materials. Hazardous materials tracking and reporting is done through an online chemical inventory database system maintained by authenticated hazardous materials users.

EH&S also reviews proposed plans for new campus facilities and for remodels to address health, safety, and environmental risks associated with activities conducted in the buildings, in accordance with applicable environmental and health and safety laws, codes, and regulations. Building plans are also reviewed by the County's Building Inspection Office and Fire Marshal's Office for compliance with applicable codes.

The EH&S Office of Emergency Management (OEM) serves as the administrative function for providing the framework within which Stanford can reduce vulnerability and sensitivity to hazards, and respond appropriately to crisis and disasters. In the event of a major emergency affecting Stanford, its Emergency Operations Center (EOC) would be activated and would work closely with applicable jurisdictional emergency response providers, as well as each of the local Department Operation Centers (DOC), in responding to and recovering from a major emergency.

EH&S also oversees several emergency notification systems at Stanford via its AlertSU strategy. AlertSU provides for: mass notification of time-sensitive notification to registered members of the Stanford community via short message service (SMS) text message, email, and/or phone; an outdoor warning system utilizing sirens throughout the core campus that can emit alert tones and verbal instructions; and information provided via Stanford's emergency website, emergency information hotlines, campus-run radio station, and Stanford's Facebook and Twitter accounts.

University Safety Partners

The University Safety Partners (USP) is a group of appointed representatives who oversee the University's health and safety program within their respective school units. The USP provides a forum for reviewing laws, regulations and Stanford policies and procedures concerning environmental health and safety practices. The USP facilitates the transfer of environmental health and safety information between the school or administrative area that they represent and the EH&S.

University Committee on Health and Safety

The University Committee on Health and Safety (UCHS) has oversight of all health and safety programs at Stanford. The Committee is comprised of thirteen voting members consisting of faculty, student, administrative and community representatives that provide advice and make recommendations on Stanford's health and safety programs, policies and organization. The UCHS reviews and recommends University-wide policies on health and safety matters. Its actions are intended to foster cooperation among units having operational responsibility for health and safety. Near the end of each academic year the UCHS holds an open meeting for the members of the Stanford community and its neighbors in which health and safety conditions at Stanford are

reported and participants are provided an opportunity to raise questions or concerns about Stanford's teaching or research activities, facilities or support services as they may affect the health and safety of lab personnel, laboratory subjects, employees, students, the general public and the environment.

Hazardous Waste Disposal

The hazardous materials used by Stanford laboratories, clinics, maintenance facilities and other entities as a normal part of their operation yield wastes that must be disposed. Three types of waste streams are regulated as hazardous: chemical, radiological and medical/biological. Stanford has ongoing management programs for the safe storage, handling and disposal of each type of waste stream. Some of these programs are described in the *Biosafety Manual, Radiation Safety Manual*, and *Chemical Hygiene Plan*.

Stanford EH&S is responsible for collecting, recycling and disposing of waste chemicals and low-level radioactive waste generated by laboratories and shops at Stanford. The waste is collected from points of generation and transported in specially equipped vehicles to the Stanford Environmental Safety Facility (ESF) by appropriately trained Hazardous Waste Technicians. Prior to collection, some of the waste may be accumulated at "Satellite Accumulation Areas," which are areas under the control of the person managing the waste generating activity. Hazardous chemical waste may be accumulated in a Satellite Accumulation Area for no more than nine months from the first day that it is generated, after which it must be transferred to the ESF. In order to ensure that chemical waste does not accumulate in labs for more than nine months, EH&S has instituted an on-line waste labelling system which assigns an accumulation start date to each container and tracks its accumulation time.

Stanford's ESF is operated pursuant to regulations and permits of, and with oversight by, local, State and federal agencies described elsewhere in the Regulatory Setting.

Stanford is a generator of hazardous chemical waste, rather than a permitted facility for long term storage, and the ESF operates pursuant to the regulations as a 90-day "Waste Accumulation Area." California EPA-Department of Toxic Substances Control (DTSC) regulatory requirements for operation of 90-day Waste Accumulation Areas include the following:

- Provisions for preparedness for and prevention of spills; e.g. secondary containment, spill control equipment;
- Written contingency plan which details actions to be taken in case of an incident;
- Waste characterization and classification;
- Proper labeling and proper use of containers;
- Weekly Inspections; and
- Recordkeeping.

The ESF operates under DTSC regulations enforced by the County HMCD. Hazardous wastes that are shipped off-site are packaged, marked, labeled, manifested, and transported in accordance

with applicable local, state and federal regulations. The Hazardous Waste Program tracks all Uniform Hazardous Waste Manifests for waste materials shipped from the campus.

All waste management personnel at the ESF have completed California State Certified Hazardous Materials Technician training, and receive annual training in accordance with regulatory requirements applicable to a 90-day Waste Accumulation Area. The facility is staffed by a full time Hazardous Waste Programs Manager, with support from appropriate technical and supervisory staff. In accordance with its role as a CUPA, the County HMCD conducts regular inspections of the Environmental Safety Facility.

The State of California has also issued a license to Stanford University for the accumulation and management of radioisotopes including radioactive waste. This license allows the University to hold certain radioisotopes in a central facility until the level of activity has decayed to levels below the regulated limits. Once these wastes have decayed to acceptable levels, they are shipped off-site for disposal.

All locations where hazardous materials or hazardous waste are stored at Stanford are inspected annually by the County HMCD.

Chemical Waste

No disposal of regulated hazardous chemical wastes occurs at Stanford. Stanford ships its hazardous waste to permitted off-site facilities for disposal. In 2016, Stanford's Hazardous Waste Program shipped 254 tons (including weight of shipping containers and packaging materials) of chemical wastes generated at Stanford to permitted off-site facilities. A chemical waste tracking system is used to track all waste shipments. The system helps identify and monitor waste streams that may be candidates for the waste minimization program and is a key element of the hazardous waste management plan.

Waste generating processes have been evaluated in laboratories producing larger volumes of waste to determine options for source reduction and waste minimization. Stanford's EH&S also operates a program to redistribute unwanted, but usable, chemicals to potential users.

Stanford is developing plans to repeat a program for partnering with the County Household Hazardous Waste Program for Stanford residents.

Radioactive Waste

All radiological materials are tracked from receipt to disposal. Low-level radioactive wastes are tracked by the Stanford Hazardous Waste Program through the ESF. After proper radiological decay in accordance with Stanford's license with the California Department of Public Health, Radiological Health Branch (CDPH-RHB), 840 cubic feet of non-radioactive dry waste was shipped off-site for incineration in 2016. During the same period, 1,700 pounds of liquid low-level radiological wastes generated within the General Use Permit boundary were disposed off-site in accordance with the applicable regulatory requirements of the CDPH-RHB.

Stanford minimizes the volumes of radioactive waste by storing dry and biological waste containing radioisotopes with radioactive half-lives less than 90 days until the radioactivity is transformed to levels indistinguishable from background. The non-radioactive items are then incinerated at a permitted off-site facility to reduce the volumes of materials discharged to a sanitary landfill.

In 1996, to address Stanford's needs for increased on-site storage capability of radioactive waste, Stanford constructed a facility adjacent to the ESF for managing these wastes in accordance with a license issued by the CDPH-RHB. The expansion of the facility increased Stanford's net storage space by about 60 percent. The facility operates at approximately 60 percent of capacity for decay of low-level radioactive waste. Use of this facility helps to ensure that appropriate on-site storage space for low-level radioactive wastes is available for the indefinite future. To compensate for the lack of in-state disposal, Stanford has transported radioactive wastes to licensed out-of-state disposal sites.

Stanford's Administrative Panel on Radiation Safety (APRS) has established policies that require the Radioisotope Use Committee to review and approve processes that will generate "mixed" wastes. Mixed wastes are a mixture of hazardous chemicals and radioactive materials. These mixed wastes require special handling and disposal and the Stanford has successfully used this review by the APRS to minimize their generation.

Medical and Biological Waste

In 2016, approximately 207 tons of medical and biological waste generated within the General Use Permit boundary were transported off-site for incineration or other appropriate treatment.

On an on-going basis, the generators of medical and biological wastes evaluate possible ways to minimize the amounts of waste requiring, by law, disposal by incineration. Some of these alternatives include: waste stream segregation at the point of generation; continuing educational programs on proper waste management for users of materials which pose medical and/or biological hazards and waste minimization techniques; and, using recyclable laboratory materials and/or medical and biological waste containers instead of disposable ones.

5.8.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on hazards and hazardous materials if it would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment;

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area;

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Approach to Analysis

In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015,[7] the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might impact a project's users or residents, except where the proposed project would significantly exacerbate an existing environmental condition. The identified significance criteria related to locating development on a site which is included on a list of hazardous materials sites; projects within an airport land use plan or in the vicinity of a private airstrip; locating development and population in a wildland fire risk area, are valid only to extent that the Project significantly exacerbates those risks. Nonetheless, all potential applicable project impacts associated with hazards and hazardous materials, and applicable regulatory mechanisms that address these effects, are disclosed in this section.

The potential for hazards and hazardous materials impacts at the Project site were determined in part by a review of the existing conditions and estimated baseline conditions, including information in available environmental databases, to indicate the presence of hazardous materials and hazardous wastes associated with past operations at the Project site. The potential for alteration or demolition of existing buildings, and/or new construction under the 2018 General Use Permit to encounter hazardous materials and/or wastes from past practices and land uses is addressed; as well as the potential for new or expanded uses operating over the course of the 2018 General Use Permit timeframe to create a hazard to the public. In addition, the analysis considers the potential for new growth and development under the 2018 General Use Permit to present a risk involving wildland fires, or adversely affect emergency response and evacuation plans.

7 *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal.4th 369. Opinion Filed December 17, 2015.

Based on the Project characteristics and the Project site location, the proposed 2018 General Use Permit was determined to have no potential impact on significance criteria (e) and (f), above:

> **Safety Hazard within Vicinity of Airport Land Use Plan, Airport or Airstrip –** The Project site is not located within the airport influence area of an airport land use plan or within two miles of any airport or airstrip. The nearest airport is the Palo Alto Airport which is approximately 2.5 miles from the Project site boundary. Therefore, the Project would not interfere with any airport land use plan or airstrip and this criterion is not discussed further.

Impact Evaluation

Construction Impacts

Impact 5.8-1: Under the proposed Project, demolition of existing structures that contain hazardous building materials would not create a significant hazard associated with exposure of workers, the public, or the environment from the transport, use, or disposal of these hazardous materials and waste. (*Less than Significant*)

Demolition and/or and modifications of existing improvements and structures on the Project site that could occur under the 2018 General Use Permit could expose construction workers, the public, or the environment to hazardous materials such as lead-based paint (LBP), asbestos containing materials (ACMs), mercury and polychlorinated biphenyls (PCBs). The level of potential impact is dependent upon the age, construction, and building materials of each affected building. Depending on the age of some of the affected structures, hazardous building materials could potentially be present, which, if disturbed, could expose workers and the public during demolition and/or renovation. Potential exposure to these hazardous building materials would be adequately reduced through compliance with abatement measures required as part of applicable regulations.

If present in an affected structure within the Academic Growth Boundary, ACMs would need appropriate abatement of identified asbestos prior to demolition or modification. ACMs are regulated both as a hazardous air pollutant under the Clean Air Act and as a potential worker safety hazard under the authority of Cal/OSHA. In structures slated for demolition or modification under the Project, asbestos-containing materials would be abated in accordance with State and federal regulations including Section 19827.5 of the California Health and Safety Code, BAAQMD Regulation 11, Rule 2, CCR Title 8 Sections 1529 and 341.6, and OSHA worker safety requirements for all demolition or renovation activities.

Consistent with current practice, prior to any facility renovation or demolition at Stanford, a comprehensive survey would be performed by certified EH&S inspectors to identify and quantify previously installed asbestos-containing products. Surveyed materials that are found to contain asbestos, and which would be disturbed by the renovation or demolition activity, would be removed or encapsulated by an EH&S approved, licensed and certified asbestos abatement contractor prior to any demolition or renovation activities. Asbestos abatement work would be performed under the direct supervision of the EH&S and in accordance with Stanford's Uniform Asbestos Abatement Specification, which incorporates safety measures that exceed State and

federal regulatory requirements. Hazardous asbestos waste generated from the demolition process would be disposed only in a certified Class II landfill that has been inspected and preapproved by the EH&S Hazardous Waste Management Program.

Due to the age of some of the existing buildings on the Project site, it is possible that LBP could be present in areas that would require renovation or demolition. As discussed above, both the federal OSHA and Cal/OSHA regulate worker exposure during construction activities that involve LBP. OSHA's Lead Exposure in Construction Rule (29 CFR Part 1926) covers construction work in which LBP may become disturbed during such activities as demolition, removal, surface preparation for re-painting, renovation, clean up and routine maintenance.

Fluorescent lighting ballasts manufactured prior to 1978, and electrical transformers, capacitors, and generators manufactured prior to 1977, may contain PCBs. Mercury has also become less common in electrical equipment but can still be found in thermostats, barometers, temperature and pressure gauges, certain switches and light bulbs. In accordance with the Toxic Substances Control Act and other federal and state regulations, during demolition or construction, any electrical equipment and lighting ballasts that may contain PCBs or mercury would be required to properly handled and disposed of, thereby reducing potential impacts to a less-than-significant level.

In conclusion, construction workers or the public could be exposed to hazardous building materials that could be disturbed during demolition and/or renovation activities on the Project site under the proposed 2018 General Use Permit. Such exposures would be eliminated or reduced to legally acceptable levels through compliance with abatement measures required as part of applicable federal, State and local regulations implemented through Stanford's EH&S programs and overseen by County of Santa Clara HMCD. Therefore, this impact would be less than significant.

Mitigation: None required.

Impact 5.8-2: Under the proposed Project, construction projects could disturb soil and groundwater contaminated by historical hazardous material use, which could present risks the health of construction workers, the public, and/or the environment. (*Potentially Significant*)

Project construction anticipated as a result of implementation of the 2018 General Use Permit would include grading, excavation, trenching, and other activities that would disturb soil and have the potential to disturb groundwater. If such disturbance occurred in areas previously contaminated by hazardous materials, construction workers, the public, and/or the environment (e.g. local waterways or storm drains) may be exposed to a localized (typically confined to active working area) release of compounds considered hazardous to human health or the environment.

This analysis relied largely on a search of available environmental DTSC and SWRCB databases for the Project site. As described in the Environmental Setting discussion, all cases but one were

closed in accordance with the applicable federal, State, and/or local regulatory agency oversight, and required no further action. In general, when cases with reported releases of hazardous materials are closed it is based on findings indicating that no further threat to human health or the environment remains. The one remaining case (involving a release of petroleum) predates the 2000 General Use Permit and is listed as inactive. The relatively small amount of hazardous materials involved with that case, and the current status of inactive, supports the low level of priority, and thus, potential threat given by the overseeing agency, the Regional Water Quality Control Board. Based on the findings of the database review, there is no evidence that there are known releases such that there would be a high potential for encountering substantive legacy contaminants in soil or groundwater during future earthwork activities as part of construction pursuant to the proposed 2018 General Use Permit.

Nevertheless, the potential exists that previously unidentified releases have occurred in the past within the Project site which could result in adverse effects to workers, the public and the environment if encountered during construction activities pursuant to the proposed 2018 General Use Permit. **Mitigation Measure 5.8-2(a)-(c)** establish protocols for construction activities that would reduce or eliminate the potential risks to public or construction worker health, or the environment, in the event that suspicious materials are encountered during earthwork activities associated with construction.

> **Mitigation Measure 5.8-2(a):** During construction within the Project site, any contractor shall cease any earthwork activities upon discovery of any suspect soils or groundwater (e.g., petroleum odor and/or discoloration) during construction. The contractor shall notify Stanford's Department of Environmental Health and Safety (EH&S) and the County of Santa Clara's Hazardous Materials Compliance Division (HMCD) of the Department of Environmental Health upon discovery of suspect soils or groundwater. EH&S will retain a qualified environmental firm to collect soil samples to confirm the level of contamination that may be present.
>
> **Mitigation Measure 5.8-2(b):** If contamination is found to be present, any further proposed soil- or groundwater-disturbing activities within areas of identified or suspected contamination shall be conducted according to a site specific health and safety plan, prepared by a California state licensed professional. The contractor shall follow all procedural direction given by County HMCD and/or identified in a Soil and Groundwater Management Plan prepared for the site by a qualified environmental firm to ensure that suspect soils are isolated, protected from runoff, and disposed of in accordance with transportation laws and the requirements of the licensed receiving facility (in coordination with EH&S).
>
> **Mitigation Measure 5.8-2(c):** If contaminated soil or groundwater is encountered and identified constituents exceed human health risk levels, it shall be delineated, removed, and disposed of offsite in compliance with the overseeing agency, either County HMCD or Regional Water Quality Control Board (RWQCB), as well as the receiving facilities' requirements.
>
> **Significance after Mitigation:** Less than Significant.

Impact 5.8-3: Improper handling or storage of hazardous materials during Project construction activities could result in spills would not significantly increase public health and/or safety risks to future residents, maintenance workers, visitors, and the public and environment in the area surrounding the spill. (*Less than Significant*)

Construction activities that would occur under the 2018 General Use Permit would require the use of certain hazardous materials such as fuels, oils, solvents, and glues. Inadvertent releases of these materials into the environment can adversely impact workers, the public, soil, surface waters, or groundwater quality. The use of construction best management practices implemented as part of a Storm Water Pollution Prevention Plan (discussed further in Section 5.9, *Hydrology and Water Quality*) as required by the National Pollution Discharge Elimination System General Construction Permit would minimize the potential adverse effects to workers, the public, surface waters, groundwater and soils. These could include the following:

- Establish a dedicated area for fuel storage and refueling activities that includes secondary containment protection measures and spill control supplies;
- Follow manufacturer's recommendations on use, storage and disposal of chemical products used in construction;
- Avoid overtopping construction equipment fuel gas tanks;
- During routine maintenance of construction equipment, properly contain and remove grease and oils.
- Properly dispose of discarded containers of fuels and other chemicals.

In general, aside from refueling needs for heavy equipment, the hazardous materials typically used on a construction site are brought onto the site packaged in quantities needed and used in accordance with manufacturer recommendations. The overall quantities of these materials on the site at any one time would be relatively small and controlled through implementation of required BMPs contained within the SWPPP. Should they occur, spills of hazardous materials on construction sites are typically localized and would be cleaned up in a timely manner in accordance with identified BMPs. As described above, refueling activities of heavy equipment would be conducted in a controlled dedicated area complete with secondary containment and protective barriers to minimize any potential hazards that might occur with an inadvertent release. Given the protective measures required to comply with federal, State, and local laws and regulations (i.e., best management practices) and the quantities of hazardous materials typically needed for construction projects under the proposed Project, the potential exposure of construction workers or the public, or contamination of soil and/or groundwater, from construction-related hazardous materials is considered a less-than-significant impact.

Mitigation: None required.

Operational Impacts

Impact 5.8-4: Operation of uses developed under the proposed Project that could involve the transportation, use, storage and disposal of hazardous materials, would not present significant public health and/or safety risks to residents, visitors, and the surrounding area. (*Less than Significant*)

The implementation of the proposed 2018 General Use Permit would involve operation of existing and new academic and academic support facilities, housing, and other supporting facilities and infrastructure. An increase in transportation, use, storage and disposal of hazardous materials would be anticipated with operation of these facilities.

The residential, classroom, office, and other campus uses (other than laboratories and research facilities) would typically include familiar hazardous materials such as toners, paints, and household cleaning products. In addition, activities such as building maintenance and landscaping commonly use fuels, oils, paints, lubricants, solvents, and pesticides. These common types of hazardous materials are typically stored and used in small quantities, and used in accordance with manufacturer recommendations. As such, the routine transport, use, storage or disposal of these materials under the Project would not be reasonably expected to cause an adverse impact to the public and the environment.

Laboratories and research facilities developed and operated pursuant to the proposed 2018 General Use Permit may include transport, handling, storage and disposal of other varied and larger quantities of hazardous materials, including low-level radioactive waste and medical/biological waste. As discussed in the Regulatory Setting, Stanford has established and implements a comprehensive system for management of hazardous materials at its facilities, as overseen by its EH&S and the County's HMCD. At Stanford EH&S is responsible for ensuring compliance with applicable laws and regulations governing the transport, use, storage and disposal of hazardous materials.

For some laboratory and research uses, the regulatory framework requires appropriate training of employees in the use, storage, and disposal of any hazardous materials and wastes. Hazardous Materials Management Plans for buildings storing hazardous materials are submitted annually to County HMCD through the Cal/EPA California Environmental Reporting System Portal. New or amended uses operating under the proposed 2018 General Use Permit would follow similar protocols as required by County HMCD. All hazardous materials are required to be stored and handled according to manufacturer's directions, and local, state and federal regulations.

Consistent with established practice, EH&S would review proposed plans for new campus facilities and for remodels so as to address health, safety, and environmental risks in accordance with applicable environmental and health and safety laws, codes, and regulations. Building plans would also be reviewed by the County's Building Inspection Office and Fire Marshal's Office for compliance with applicable codes. In addition, building projects would be reviewed by the County HMCD as part of the standard Architecture Site Approval (ASA) or building permit process. In this process, Stanford would disclose the type and quantity of hazardous materials that would be used in the new building as regulated by California Accidental Release Prevention Law

requirements, as well as toxic gases, medical waste, hazardous waste, biohazards and radioactive materials; and the County Department of Environmental Health would review this information and if determined necessary would require additional conditions.

Under operation of the Project, adherence to applicable regulatory requirements would minimize potential exposure of people or the environment to hazardous materials as a result of the routine transport, use, storage or disposal of hazardous materials. This would result in a less-than-significant impact.

Mitigation: None required.

Impact 5.8-5: Hazardous materials used at facilities operating under the Project could potentially be spilled through upset or accidental conditions, but would not significantly increase public health and/or safety risks to future residents, workers, visitors, and the surrounding area. (*Less than Significant*)

As noted above, facilities operating under the 2018 General Use Permit would include the use hazardous materials and waste whether for maintenance activities or as part of laboratory and /or research activities. If not handled appropriately, upset and accident conditions could result in releases of hazardous materials or wastes that could result in adverse effects to residents, workers, the public or the environment.

As described above, facilities that would store hazardous materials and/or waste would be required to submit a Hazardous Materials Management Plan and Hazardous Materials Business Plan and be subject to the training and oversight of Stanford's EH&S program. EH&S would provide the appropriate oversight and guidance to ensure that all hazardous materials use would be in accordance with County HMCD requirements. The County HMCD requires all users to follow applicable regulations and guidelines regarding storage and handling of hazardous waste in a manner such that accidental spills or releases are minimized and spill response supplies are readily available to quickly contain any spill that may occur. In accordance with the County Hazardous Materials Storage Ordinance, the HMCD conducts periodic inspections to ensure hazardous materials are stored and handled properly and safety supplies are readily accessible. Any uses with relatively larger quantities of hazardous materials use, storage, and disposal of wastes would have more stringent inspection and safety requirements that would similarly minimize any accidental releases. With adherence to these existing regulatory requirements and management programs, the potential impact to workers, residents, visitors, or the environment would be reduced to a less-than-significant level.

Mitigation: None required.

Impact 5.8-6: New development under the proposed Project could potentially be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thus, could result in a safety hazard to the public or environment. (*Potentially Significant*)

As discussed in Impact 5.8-2, based on a review of the DTSC and SWRCB environmental databases for the Project site, all but one case were closed in accordance with the applicable regulatory agencies and required no further action; and the remaining case (which involved a release of petroleum) predates the 2000 General Use Permit, is listed as inactive, and did not warrant immediate action by the RWQCB. Nevertheless, **Mitigation Measures 5.8-2(a), 5.8-2(b), 5.8-2(c)** are identified to ensure that any earthwork activities that occur on the Project site that may encounter suspicious materials would be adequately addressed, and would not represent a significant adverse impact to new development associated with the 2018 General Use Permit.

Therefore, with implementation of Mitigation Measure 5.8-2(a) and 5.8-2(b) above, the potential for residual contamination to significantly impact the public or environment would be less than significant.

Mitigation: Implement Mitigation Measure 5.8-2(a)-(c).

Significance after Mitigation: Less than Significant

Impact 5.8-7: Implementation of the Project could result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school, but would not create a significant hazard to those facilities. (*Less than Significant*)

Several primary and secondary schools are located within 0.25 miles of the boundary of the Project site, including Oak Knoll Elementary School (1895 Oak Knoll Lane), Sand Hill Special Education School (650 Clark Way), AltSchool Emerson (930 Emerson Street), Lucille M. Nixon Elementary School (1711 Stanford Ave), Escondido Elementary School (890 Escondido Road), Castilleja School (1310 Bryant Street), Living Wisdom School (456 College Avenue), and Palo Alto High School. There are also several childcare and preschools located within or near the Project site boundary, including Bing Nursery School (850 Escondido Road), Amigos de Palo Alto Preschool (1611 Stanford Avenue) and Casa de Bambini Preschool (457 College Avenue).

In addition, the proposed 2018 General Use Permit would provide for development of new childcare center use within the Academic Growth Boundary. As discussed above, while existing and new facilities under the Project would include laboratory and research uses that involve hazardous materials, the proposed Project would not include a substantive change in hazardous emissions, and all transportation, use, storage, and disposal of hazardous materials would be conducted in accordance with applicable local, State, and federal requirements. Therefore, implementation of the 2018 General Use Permit would not result in any adverse exposure to hazardous emissions to existing or future schools within, or in the vicinity of, the Project site.

Mitigation: None required.

Impact 5.8-8: Development facilitated by the Project would not substantially impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

As discussed in Section 5.13 of this Draft EIR, *Public Services*, under the Project fire protection services would be provided to the Project site by the City of Palo Alto Fire Department (PAFD). The PAFD currently delivers emergency and non-emergency services, including rapid assistance for medical, fire, or other hazardous situations, to Stanford. New academic uses and housing constructed pursuant to the proposed 2018 General Use Permit would be located on vacant land, infill sites and redevelopment sites within the Academic Growth Boundary. New development associated with the Project would be reviewed by the County Fire Marshal (with courtesy review by the PAFD) to ensure that the street system serving each development would accommodate emergency response and evacuation.

Any changes to the circulation network that may occur under the Project would be designed to accommodate appropriate emergency access to, and egress from, all areas of the Project site. Proposed improvements would be required as needed to enable existing aid emergency vehicles traveling from existing facilities to reach all development on the Project site. Additionally, all Project-specific designs, including private internal circulation and building site plans, shall be subject to review and approval by emergency service providers, per Fire Code requirements.

Under the Project, Stanford would continue to operate its Office of Emergency Services (OES) and coordinate emergency response planning efforts with applicable jurisdictional emergency response providers, including County OES. Under the Project, Stanford would also continue to maintain its emergency notification systems at Stanford via its AlertSU strategy.

The proposed development and existing emergency response requirements are sufficient to ensure that possible impairment or implementation of any emergency response or evacuation plans would be considered a less-than-significant impact.

Mitigation: None required.

Impact 5.8-9: Development under the Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. (*Less than Significant*)

As discussed in the Environmental Setting, the Project site encompasses a highly diverse landscape, ranging from the relatively developed campus within the Academic Growth Boundary, to the largely undeveloped foothills which are designated by the County as a wildland/urban interface. Based on mapping from CAL FIRE, the majority of the developed area within the Academic Growth Boundary of the Project site is designated as a community at risk of wildland

fire. New academic uses and housing developed under the 2018 General Use Permit would be concentrated within the Academic Growth Boundary.

As discussed above, and in Section 5.13, *Public Services*, fire protection services would be provided to the Project site by the PAFD as part of the continuing agreement between the City and Stanford. The Fire Department delivers emergency and non-emergency services, including rapid assistance for fires, and enforces implementation of all California Fire Code requirements. In addition, all of Santa Clara County's fire agencies are part of both countywide and State mutual aid agreements to ensure that firefighting resources and personnel are available to combat wildland urban interface fires.

All development associated with the Project would be required to include fire suppression design requirements as specified in current adopted building codes. Implementation of applicable fire and building code standards would ensure that adequate fire and life safety measures are incorporated into the Project in compliance with all applicable state and local fire safety regulations. All the above factors would reduce the potential impact associated with exposure of people and property to risk involving wildland fires to a less than significant level.

Mitigation: None required.

Cumulative Impacts

Impact 5.8-10: Hazards at the Project site, in combination with past, present, and future projects could potentially contribute to cumulative hazards. (*Potentially Significant*)

The geographic scope of potential cumulative hazards and hazardous materials impacts encompasses primarily the Project site and immediate surrounding area. Hazardous materials and hazard impacts are generally site-specific and depend on past, present and future uses that may affect soil and groundwater conditions, and public exposure.

Cumulative hazardous materials effects could occur if activities at the Project site and other past, existing and proposed development, together, would significantly increase risks in the vicinity of the Project site. However, most routine hazardous materials activities at the Project site would likely involve relatively small quantities of hazardous materials. Typically, there is no interaction between similar activities at different sites, as incidents such as accidental releases tend to be isolated and do not combine to become cumulatively considerable. In addition, based on the existing management of hazardous materials and the continued oversight, guidance and compliance monitoring that would be conducted by Stanford's EH&S and/or County HMCD, there would not be a substantial change in how hazardous materials are handled on the proposed Project site. Land uses surrounding the Project site which include the Stanford Hospital, Lucile Packard Children's Hospital, Stanford Research Park, SLAC National Accelerator Laboratory, and other light industrial and commercial land uses are subject to similar regulations and internal standard operating procedures which control the use, storage, and disposal of hazardous materials such that exposure and release risks are minimized. As a result of these existing regulatory

requirements, the potential hazardous materials and hazard impacts would not combine to become cumulatively considerable.

Cumulative health and safety impacts could also occur if Project-related offsite hazards were to interact or combine with those of existing and/or proposed non-Project development. This could only occur through the following mechanisms: air emissions; transport of hazardous materials and waste to or from the Project site; inadvertent release of hazardous materials to the sanitary sewer, storm drain, or non-hazardous waste landfill; and potential accidents that require hazardous materials emergency response capabilities. Air emissions are addressed in Section 5.2, *Air Quality*. The proposed Project as well as other past, present, and future projects would be required to adhere to existing regulatory requirements for the appropriate handling, storage, and disposal of hazardous materials that are designed to minimize exposure and protect human health and the environment. Cumulative increases in the transportation of hazardous materials and wastes would cause a less than significant impact because the probability of accidents is relatively low, and the use of legally required packaging minimizes the consequences of potential accidents. In addition, all cumulative projects in the area would be required to comply with the same laws and regulations as the Project. This includes federal and state regulatory requirements for transporting (Cal EPA and Caltrans) hazardous materials or cargo (including fuel and other materials used in all motor vehicles) on public roads or disposing of hazardous materials (Cal EPA, DTSC, County HMCD).

During construction, implementation of Mitigation Measure 5.8-2(a)-(c) would also reduce any Project contribution to potential cumulative disturbance of soil and groundwater. Given this and all the other factors discussed above, the cumulative impact of the Project to hazards and hazardous materials would be less than significant.

Mitigation: Implement Mitigation Measures 5.8-2(a)-(c).

Significance after Mitigation: Less than Significant.

Impact 5.8-11: The Project, in combination with past, present, and future projects would not substantially impair implementation or physically interfere with emergency response or evacuation plans. (*Less than Significant*)

As discussed in Impact 5.8-7, above, site review for individual building projects and existing emergency response requirements are sufficient to ensure that the Project's effect on potential impairment or implementation of any emergency response or evacuation plans would be considered a less-than-significant impact. Other non-Project cumulative development in the surrounding area could increase the amount of people and structures that could interfere with emergency evacuation or emergency response plan. As described in the Regulatory Setting above, the County OES is the lead agency to support and coordinate emergency response and recovery operations in the County. The OES also participates in the Local Hazard Mitigation Plan and the Santa Clara County Operational Area Emergency Operations Plan (EOP). These regional plans are adaptive to changes in population and provide the inter-agency coordination to ensure that

emergency response and evacuation can be effectively coordinated in an emergency and therefore the effects of the Project would not combine to become cumulatively considerable.

Mitigation: None required.

Impact 5.8-12: The Project, in combination with past, present, and future projects would not substantially contribute cumulatively to exposure to wildland fires. (*Less than Significant*)

An increase in people or structures within a wildfire risk area could increase the risk of exposure of people and property to wildland fires or risk of starting wildland fires. The proposed Project as well as other land uses in the Project vicinity would include the proper mechanisms to ensure the Project's potential impacts to wildland fire hazards and emergency response access would be less than significant, and correspondingly, would also ensure the Project's contribution to cumulative effects on wildland fires would also be less than significant.

Mitigation: None required.

5.8.6 References

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5.9 Hydrology and Water Quality

5.9.1 Introduction

This section presents the hydrologic and water quality conditions in the project region and addresses the potential for adverse effects related to hydrology and water quality as a result of construction activities and campus operations under the proposed 2018 General Use Permit. This section includes a description of the existing and 2018 baseline environmental settings as it relates to hydrology and water quality in the region. A discussion of applicable federal, State, and County regulations pertaining to these proposed activities is also provided. This section assesses the potential for implementation of the proposed 2018 General Use Permit to substantially degrade water quality or violate water quality standards, affect groundwater supplies and groundwater recharge, substantially increase surface runoff or erosion, or exacerbate flooding hazards from new development. The section also identifies applicable regulatory mechanisms and/or potentially feasible mitigation measures, as necessary, to reduce significant impacts associated with hydrology and water quality.

Please also see Section 5.8, Hazards and Hazardous Materials, which addresses potential for accidental releases of hazardous materials to cause contamination of groundwater; and Section 5.16, Utilities and Service Systems, for a discussion of potable water supply and use.

5.9.2 Existing Environmental Setting

Hydrology

Climate

The Project site is located in a region generally characterized as having a Mediterranean climate with moist, mild winters and hot, dry summers. However, the region's varied topography creates microclimates dependent upon elevation, proximity to the Bay or coast, and orientation. As a result, stark climatic differences reflected in temperature, rainfall amounts, and evapotranspiration can occur over relatively short distances. More than 90 percent of precipitation in the Bay Area falls between November and April. Bay Area lowlands (i.e., valley bottoms) receive an annual rainfall of about 15-20 inches in the South Bay.

Regional Hydrology

The San Francisco Bay watershed covers 4,600 square miles and this estuarine system conveys waters of the Sacramento and San Joaquin rivers into the Pacific Ocean. The San Francisco Bay includes the San Pablo Bay, Central Bay, and the South Bay. Major tributaries that drain into the South Bay include the Alameda Creek, Guadalupe River, the Coyote Creek, Permanente Creek and San Francisquito Creek. The Project site is located within the South Bay hydrologic region in the extreme northwest corner of Santa Clara County. The core campus of the Project site is located on a portion of the 5-mile-wide alluvial plain situated between San Francisco Bay on the east and the foothills of the Santa Cruz Mountains on the west. The topography of this alluvial plain is relatively flat and typical of San Francisco Bay-margin lowlands. The largely undeveloped portions of the

Project site (i.e., areas outside the Academic Growth Boundary) are located within lower foothills of the Santa Cruz Mountains.

Local Surface Water

Figure 5.9-1 illustrates the watersheds on the Project site. The Project site is located within the San Francisquito Creek and Matadero Creek watersheds. Both of these drainages discharge into the southern portion of San Francisco Bay as they flow from southwest to northeast. The overall slope of the Project site descends in a northeasterly direction. The slope across the central campus portion of the Project site area is gradual, with elevations ranging from approximately 160 feet above mean sea level (amsl) along Junipero Serra Boulevard to about 50 feet amsl near El Camino Real. Within the foothills west of Junipero Serra Boulevard, the slopes on the Project site are more pronounced, with the elevations ranging from approximately 200 feet amsl to nearly 500 feet amsl.

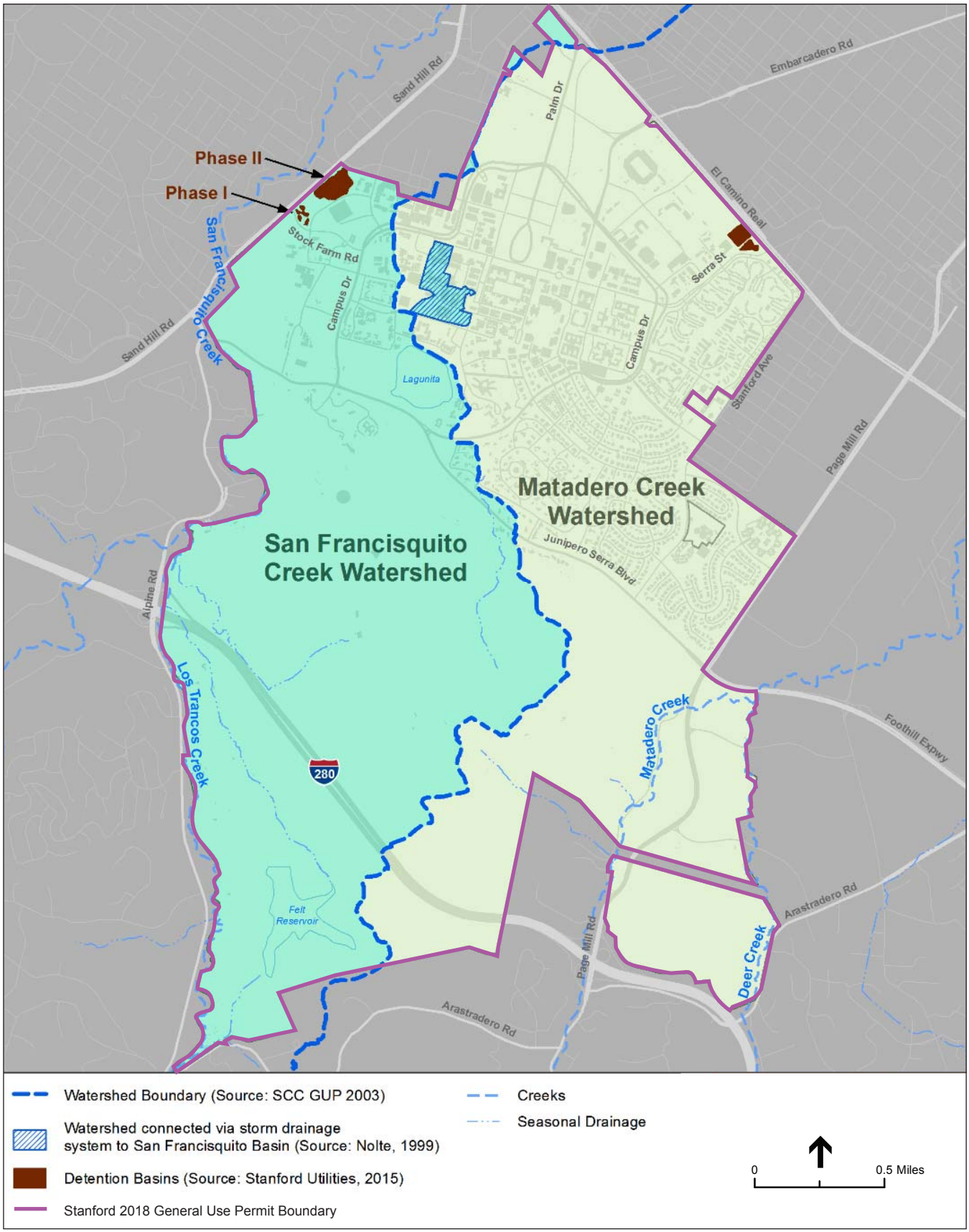
San Francisquito Creek Watershed

Approximately 1,800 acres of the Project site are within the San Francisquito Creek watershed. San Francisquito Creek originates upstream of the Project site in the Santa Cruz Mountains, at the confluence of Bear Creek and Corte Madera Creek (just below Searsville Lake – see description below) in the Jasper Ridge Biological Preserve. The creek runs approximately 13 miles, and after exiting the foothills near Junipero Serra Boulevard and Alpine Road runs in an incised channel, ultimately draining to the Bay south of the Dumbarton Bridge. As shown in Figure 5.9-1, in the Project site vicinity, Los Trancos Creek flows along a portion of the Project western boundary, and joins San Francisquito Creek downstream between Interstate 280 (I-280) and the Stanford Golf Course. San Francisquito Creek then continues north along the west edge of the Project site, before diverging from the Project site prior to crossing Sand Hill Road. During all but the wettest years, substantial portions of San Francisquito Creek and its tributaries dry up by mid-summer.

Matadero Creek Watershed

The Matadero Creek watershed also originates in the Santa Cruz Mountains and flows northeasterly for eight miles where it joins Adobe Creek just before discharging into San Francisco Bay. Approximately 2,100 acres of the Project site are within the Matadero Creek watershed. As shown in Figure 5.9-1, in the Project site vicinity Matadero flows under I-280, through agricultural lands on the Project site south of Foothill Expressway, and hence off-site through the developed commercial and residential areas of the Stanford Research Park and Palo Alto. One major tributary, Deer Creek, also known as Purisima Creek, flows along a portion of the Project site eastern boundary and joins Matadero Creek just upstream of Foothill Expressway. Both creeks have reaches that dry out during drought conditions but Deer Creek is much more ephemeral and susceptible to drying than the generally perennial Matadero Creek. Stanford conducts routine and emergency maintenance work, such as debris removal, in and around Matadero and Deer Creeks.

Downstream of El Camino Real, Matadero Creek has been channelized and concrete-lined for flood control. A mix of open space, low-density residential housing, and undeveloped private property covers the upland areas of the watershed. The downstream areas of the Matadero Creek watershed have been highly modified and are either commercial or high-density residential.



SOURCE: Stanford LRBE LUEP, 2017

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Figure 5.9-1
Watershed Boundary and Detention Basins

Stanford Lake Water System

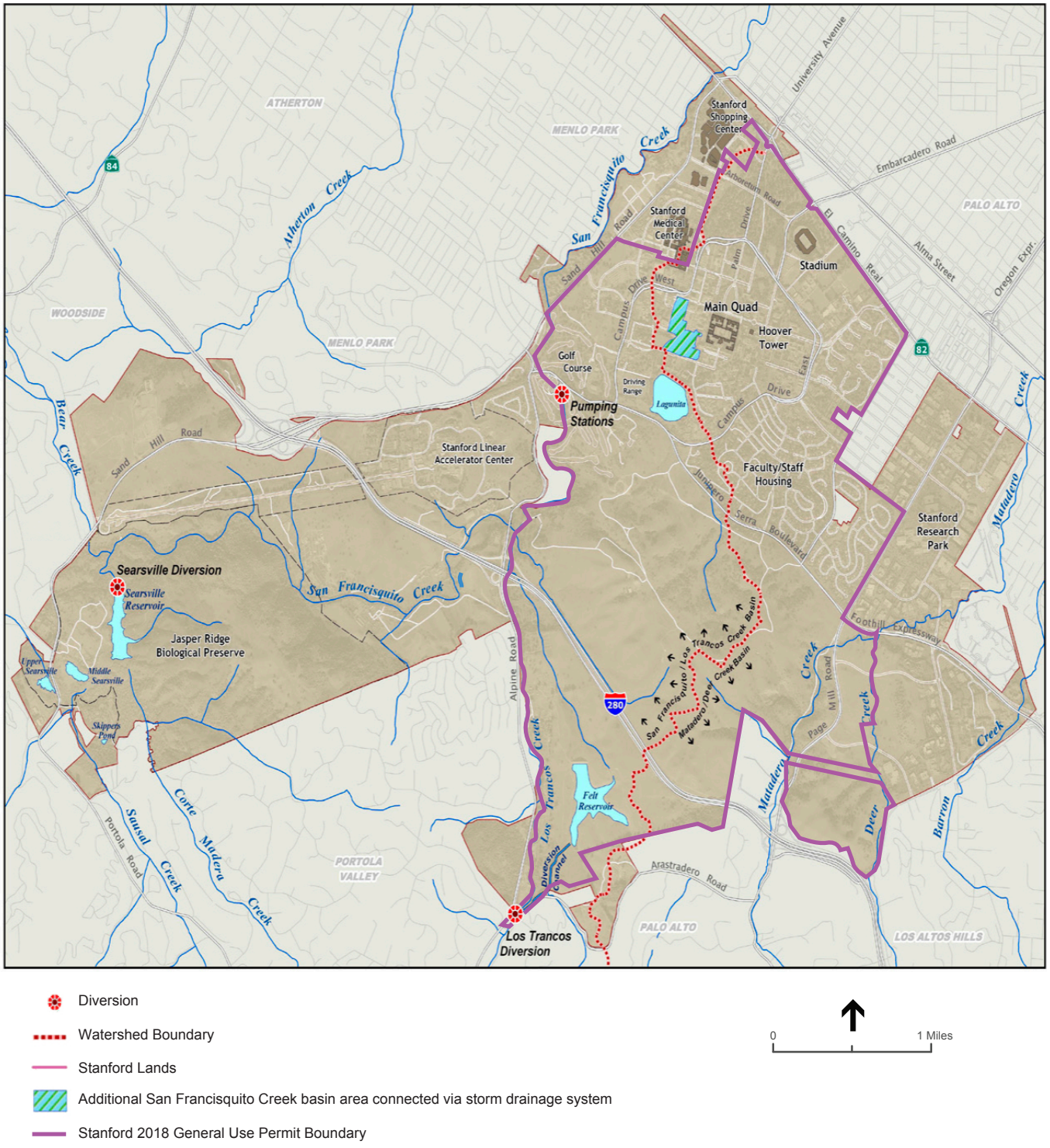
Stanford holds riparian and pre-1914 appropriative water rights reported under four Statements of Water Diversion and Use (S004660, S004661, S015695, and S015696) and one appropriative right licensed by the SWRCB (L001723) that entitle Stanford to divert water from Los Trancos Creek, San Francisquito Creek, and Searsville Reservoir. The non-potable water system consisting of reservoirs, pump stations and pipelines for delivery to campus is referred to as Stanford's Lake water system, and is illustrated in **Figure 5.9-2**. The rights provide water for landscape irrigation, stockwatering, recreation, fire protection, and habitat purposes. If needed, Stanford surface water can be treated and made available for potable use in case of an emergency. The primary components of the Stanford Lake water system are described below:

- ***Los Trancos Creek Diversion / Felt Reservoir.*** A diversion ditch in Los Trancos Creek and a dam that created Felt Reservoir were first constructed by J.J. Felt in 1878. Stanford constructed a new dam in 1929, increasing the size of the reservoir. The dam, located near the south end of the Project site, diverts creek water to a conveyance channel, which directs flows by gravity to the Felt Reservoir. Felt Reservoir is the largest storage reservoir in the Stanford Lake water system. Felt Reservoir currently has a capacity of approximately 1,050 acre-feet.

- ***San Francisquito Creek Diversion.*** Stanford has operated a water diversion in San Francisquito Creek near the Stanford Gold Course for over a hundred years. In 1986, Stanford relocated the diversion to its present in-channel location, and the pump station was completely reconstructed in 1998. The pump station contains two pairs of pumps, for which one pair (Lagunita pumps) diverts water to Lagunita (see discussion below), and the second pair (Felt Pumps) diverts water to a pipeline that connects Felt Reservoir to the Stanford Lake water distribution system.

- ***Searsville Diversion / Searsville Dam and Reservoir.*** Searsville Reservoir is located upstream of the Project site just downstream of the confluence of Corte Madera and Sausal Creeks in the San Francisquito watershed. Searsville Reservoir was formed by Searsville Dam, a masonry dam built in 1892. The diversion system utilizes valved intakes just upstream of the dam, with the discharge piping exiting the dam and extending through Stanford lands (assisted by a booster pump station) to the Lake Water system piping which extends up to Felt Reservoir and to the Stanford campus. The reservoir has less than 10 percent of its original water capacity due to deposition of sediment; and its current capacity is approximately 100 acre feet.

- ***Lagunita.*** Lagunita is an off-channel seasonal reservoir that was created in the late 1870s, and is located in the Lagunita Development District, just north of Junipero Serra Boulevard. In most years, Lagunita partially fills with rainwater runoff during the winter, depending on the amount and intensity of rainfall. The Lagunita lakebed and berm are permeable, and in order for Lagunita to hold water for more than a few weeks at a time, and provide suitable California tiger salamander (CTS) breeding habitat, water is added via the in-channel diversion in San Francisquito Creek. In most years of above average winter rainfall, Stanford typically adds water to Lagunita between mid-March and mid-June. Historically, managed water levels have varied considerably, depending on water availability in San Francisquito Creek, projected use of Lagunita, and functioning of the diversion system and storage facility. If needed, Stanford can also provide supplemental water from Felt Reservoir, groundwater wells, or other non-potable water sources in addition to, or in lieu of, creek water diversion. (See also discussion of use of Lagunita for groundwater recharge, below.)



Diversion

Watershed Boundary

Stanford Lands

Additional San Francisquito Creek basin area connected via storm drainage system

Stanford 2018 General Use Permit Boundary

0 1 Miles

SOURCE: Stanford LRBE LUEP, 2006

Stanford 2018 General Use Permit . 160531

Figure 5.9-2
Stanford Lake Water System

Between 2010 and 2015, Stanford's annual average surface water diversions were 704 acre-feet, fluctuating between a low of 85.0 acre-feet in 2015 and a high of 1,004.9 acre-feet in 2012[1] (Schaaf & Wheeler, 2017).

Flooding

Flooding is inundation of normally dry land as a result of rise in the level of surface waters or rapid accumulation of stormwater runoff. Flooding can also occur due to catastrophic failure of dams or levees. According to data compiled by the Federal Emergency Management Agency (FEMA), the Project site has not been included as part of their Flood Insurance Rate Maps (FIRM) flood mapping (FEMA, 2009). However, areas immediately adjacent to the campus located within the City of Palo Alto and Menlo Park are mapped as being within Zone X, which is considered part of the 500 year flood zone.

Storm Drainage System

Stanford's stormwater runoff is collected in a storm drainage system. The Stanford campus storm drainage system consists of an extensive network of catch basins, conveyance pipes, and open soil drainage ditches. Once storm water is collected in the drainage network, it flows by gravity from the campus to Matadero Creek or San Francisquito Creek, and, in many cases through the City of Palo Alto's storm drainage system, before entering San Francisco Bay. Stanford regularly inspects and maintains its storm drainage facilities.

Detention Facilities

As a condition of the 2000 General Use Permit, Stanford is required to implement facilities to ensure that peak storm runoff from development authorized by the 2000 General Use Permit will not increase or cause downstream flooding. Stanford developed on-site detention facilities on a watershed basis to create sufficient capacity to offset increased runoff associated with all new impervious surfaces constructed under the 2000 General Use Permit. A Storm Drainage Detention Master Plan was submitted in April 2001 and approved by the County in 2004.

The majority of the detention capacity is provided by recreational fields that Stanford has developed to serve Stanford recreational needs, but which also serve to provide stormwater detention. All detention facilities are designed to only store storm water runoff temporarily and not create extended ponding. In 2001, Stanford constructed recreational facilities near the Serra Street/El Camino Real intersection (as illustrated in Figure 5.9-1) that provide detention capacity to offset potential runoff from additional impervious surface of approximately 208 acres in the Matadero Creek watershed. In 2003, Stanford constructed Phase 1 detention basins near the

[1] The amount of Stanford's surface water diversion, and relatedly, groundwater use, can differ substantially from year to year. Both the quantity and timing of wet-season rainfall are highly variable, directly affecting both surface water availability and plant irrigation needs. During wet years, Stanford diverts more surface water from local streams, when plant irrigation needs are less than average, particularly if the rainy season extends into the fall or spring. In wet years, Stanford might meet most irrigation needs with surface water, relying very little on groundwater. In drier years, plants require more irrigation, and streamflows may be too low for Stanford to meet these demands with surface water; so Stanford pumps additional groundwater to meet its landscape irrigation needs (Schaaf &Wheeler, 2017).

Stock Farm Road/Sand Hill Road intersection that provide detention capacity to offset potential runoff from additional impervious surface of approximately 10 acres in the San Francisquito Creek watershed. In 2015, Stanford constructed additional recreational fields near the Pasteur Drive/Sand Hill Road intersection that provide detention capacity (known as Phase 2 detention) to offset approximately 57 acres of additional impervious surface in this watershed.

Based on annual reporting compiled by Stanford, as of September 1, 2016, it is estimated that Stanford's remaining detention capacity would offset approximately 195.5 acres of additional impervious surface area in the Matadero Creek watershed, and Stanford's remaining detention capacity the San Francisquito Creek watershed would offset approximately 58.1 acres of additional impervious surface area in this watershed.

Surface Water Quality

During periods of wet weather, stormwater runoff carries pollutants and sediments from all parts of a watershed into surface water bodies such as storm drains, streams, rivers, reservoirs, or marshes. In an urban setting, natural drainage patterns have been altered and stormwater runoffs, as well as non-storm discharges (irrigation water, accidental spills, washdown water, etc.), pick up sediments and contaminants from land surfaces, and transport these pollutants into surface and ground water. These diffuse sources of pollutants range from parking lots, bare earth at construction sites, agricultural sites and a host of many other sources. The total amount of pollutants entering aquatic systems from these diffuse, nonpoint sources is now generally considered to be greater than that from any other source, such as pipe discharges (point source).

Human-related changes within the San Francisquito Creek and Matadero Creek watersheds have led to changes in the erosion, transport and deposition of sediments and pollutants within the creeks, primarily due to urban development. As noted above, both Searsville and Felt Reservoirs have experienced substantial deposition of sedimentation over time. The Searsville Dam has been a substantial modification in the San Francisquito Creek watershed. For the past century the reservoir has intercepted coarse sediment transport in San Francisquito Creek, which has resulted in erosion and other changes to the stream, and reduced fine sediment transport, affecting water quality [Northwest Hydraulic Consultants (NHC) and Jones and Stokes Associates (J&S) 2004].

San Francisquito Creek is currently listed as impaired by sedimentation/siltation under Section 303(d) of the Clean Water Act, for which a Total Maximum Daily Load (TMDL) is still required. In addition, both San Francisquito and Matadero Creeks are listed as impaired by Diazinon (an insecticide) and trash under Section 303(d); these pollutants are currently being addressed under either USEPA-approved TMDLs or other applicable actions (RWQCB, 2017). (See discussion of Clean Water Act under Regulatory Setting, below). Between 2012 and 2014 Stanford conducted stormwater sampling at several locations on the campus to monitor water quality parameters in Stanford's storm drainage system, as summarized in **Table 5.9-1**. The water quality results are relatively consistent and are typical of an urban area.

TABLE 5.9-1
STORMWATER QUALITY DATA

Constituent	Units	2012 to 2014
Specific Conductance	umhos/cm	22-130
pH	Units	7.73 to 8.14
Total Suspended Solids	mg/L	7 to 73
Oil and Grease	mg/L	<5

NOTES:
umhos/cm = micromhos
mg/L = milligrams/liter
NTU = Nephelometric Turbidity Unit

The 2012 to 2014 sampling included six samples analyzed for Specific Conductance, five samples for pH, eight samples for total suspended solids, and two samples for oil and grease.

SOURCE: Stanford, 2017a

Stanford incorporates a variety of stormwater treatment facilities into its on-campus drainage system to meet runoff treatment regulations, including hydrodynamic separation, pervious pavements, infiltration trenches, vegetated swales, stormwater capture facilities, and bio-retention basins. (See discussion of regulatory requirements for stormwater treatment under Regulatory Setting, below.)

Groundwater Basin

The Project site is located within the 580-square-mile Santa Clara Valley Groundwater Basin. The basin surrounds the southern end of San Francisco Bay and has been divided by the California Department of Water Resources (DWR) into four subbasins: East Bay Plain, Niles Cone, Santa Clara, and San Mateo Plain. Topographically defined by the shoreline of the San Francisco Bay and the upland mountain ridges, the Santa Clara Valley Groundwater Basin consists of younger, water-bearing alluvial deposits that are mainly recharged by percolation through the coarse, gravelly material found in the region's streambeds and, to a lesser extent, by the direct percolation of rainfall within relatively pervious soils found in some upland valleys. Water quality is generally acceptable within the bayside areas, and well yields can be adequate for a range of uses, including municipal supply.

The California Department of Water Resources (DWR) Bulletin 118, Santa Clara Valley Groundwater Basin, San Mateo Subbasin, describes groundwater level trends in both the Santa Clara and San Mateo Subbasins as stable, having largely recovered from 1960s levels due to decreased pumpage (many former pumpers now rely on imported surface water deliveries) and increased recharge.

The Santa Clara Valley groundwater basin has not been adjudicated, is not identified by the DWR as an overdrafted basin, nor is it projected to enter a state of overdraft. The Santa Clara Valley Water District (SCVWD) is designated by the DWR as the exclusive Groundwater Sustainability Agency for the Santa Clara Subbasin. The SCVWD actively manages its water supply portfolio to ensure that groundwater use within the basin remains sustainable, employing methods such as

managed groundwater recharge, conjunctive use, local surface water capture and storage, imported water, and recycled water to enhance and supplement groundwater supplies.

Local Groundwater Use

As shown in **Figure 5.9-3**, Stanford maintains five active groundwater supply wells, three of which are located within the General Use Permit boundary, and two located on adjacent Stanford land. These wells withdraw groundwater from the San Francisquito Cone, a smaller groundwater basin within the Santa Clara Valley Groundwater Basin located along the boundary between the Santa Clara Plain and San Mateo Plain subunits.[2] Water-bearing units in the San Francisquito Cone consist of sands and gravels that were deposited over the last 5 million years in alluvial fans along the Santa Cruz Mountains, and then subsequently covered in alluvium and Bay Mud. The Cone contains both confined and unconfined aquifer units, with water table surfaces generally sloping gently towards San Francisco Bay.

Stanford pumps groundwater into its Lake water system to supplement its non-potable landscape irrigation system. Groundwater is also pumped into the Lake Water system if needed to provide supplemental water to maintain the water level in Lagunita reservoir. In addition, four of the wells (Wells 1, 2, 3R, and 5) are permitted for domestic supply and could be pumped into the domestic water system in the event of an emergency or other operational need. Well 4R is only used for non-potable purposes and is not currently permitted for use in the domestic water system.

Between 2010 and 2015, Stanford's total groundwater use was 3,500 acre-feet (which amounts to an annual average of 584 acre-feet), representing 13 percent of Stanford's total water use during that period. Stanford's groundwater use fluctuated during this five year period between a low of 127 acre-feet in 2011 and a peak of 1,359 acre-feet in 2014.[3]

Stanford Lands Building & Real Estate Department (LBRE), Facilities Operations – Utilities Division indicates depth to groundwater varies across the Project site and over time with hydrologic conditions and pumping rates, but currently ranges between 30 and 60 feet below ground surface within the Academic Growth Boundary.

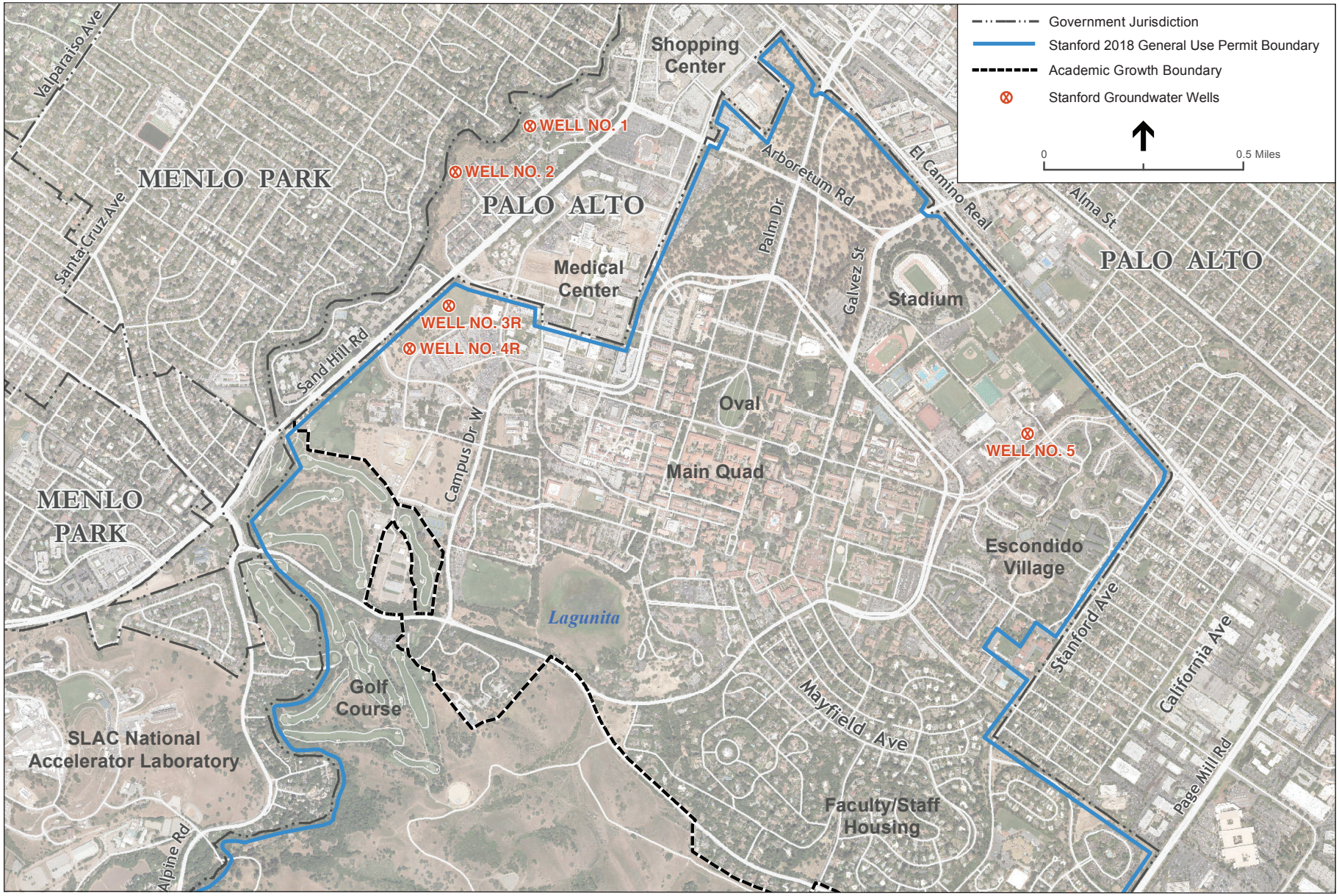
Local Groundwater Quality

Stanford closely monitors the water quality of the wells to ensure compliance with the domestic water permit requirements. **Table 5.9-2** presents a summary of water quality data for its on-campus wells averaged from 1999 to April 2017. The averages generally indicate that the groundwater quality meets potable water standards. Nevertheless, as indicated above, while Stanford has the capability to use the well water for potable consumption, it presently only uses groundwater for non-potable uses.

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2 Alluvial fan sediments in the San Francisquito Cone form the water-bearing sediments of what the U.S. Geological Survey has defined as the "San Francisquito Cone Subbasin", a smaller groundwater basin that straddles the San Mateo Plain subbasin and the Santa Clara subbasin boundary.

3 The amount of groundwater use, and relatedly, surface water diversion, can vary substantially from year to year; please see Footnote 1.



SOURCE: Stanford LRBE LUEP, 2017

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Figure 5.9-3
Groundwater Well Locations

TABLE 5.9-2
WATER QUALITY DATA FOR STANFORD'S ON-CAMPUS WELLS 1999 – 2017 [a]

Constituent	Units	Drinking Water Standard	Well 1 (570 feet deep)	Well 2 (300 feet deep)	Well 3R (360 feet deep)
pH	Units	None	7.4	7.4	7.6
Total Dissolved Solids	mg/L	500**(recommended) 1,000 ** maximum	591	597	620
Odor	Units	3[b]	<1.0	<1.0	<1.0
Turbidity	NTU	5[b]	0.2	0.2	0.2
Hardness (as Calcium Carbonate)	mg/L	None	367	401	359
Calcium	mg/L	None	103	109	105
Magnesium	mg/L	None	26	31	23
Sodium	mg/L	None	53	44	76
Potassium	mg/L	None	2.6	2	2.2
Total Alkalinity (as Calcium Carbonate)	mg/L	None	262	263	245
Bicarbonate	mg/L	None	320	320	298
Chloride	mg/L	250[b]	76	68	88
Nitrate (as N)	mg/L	10[c]	3.5	3.6	4.3

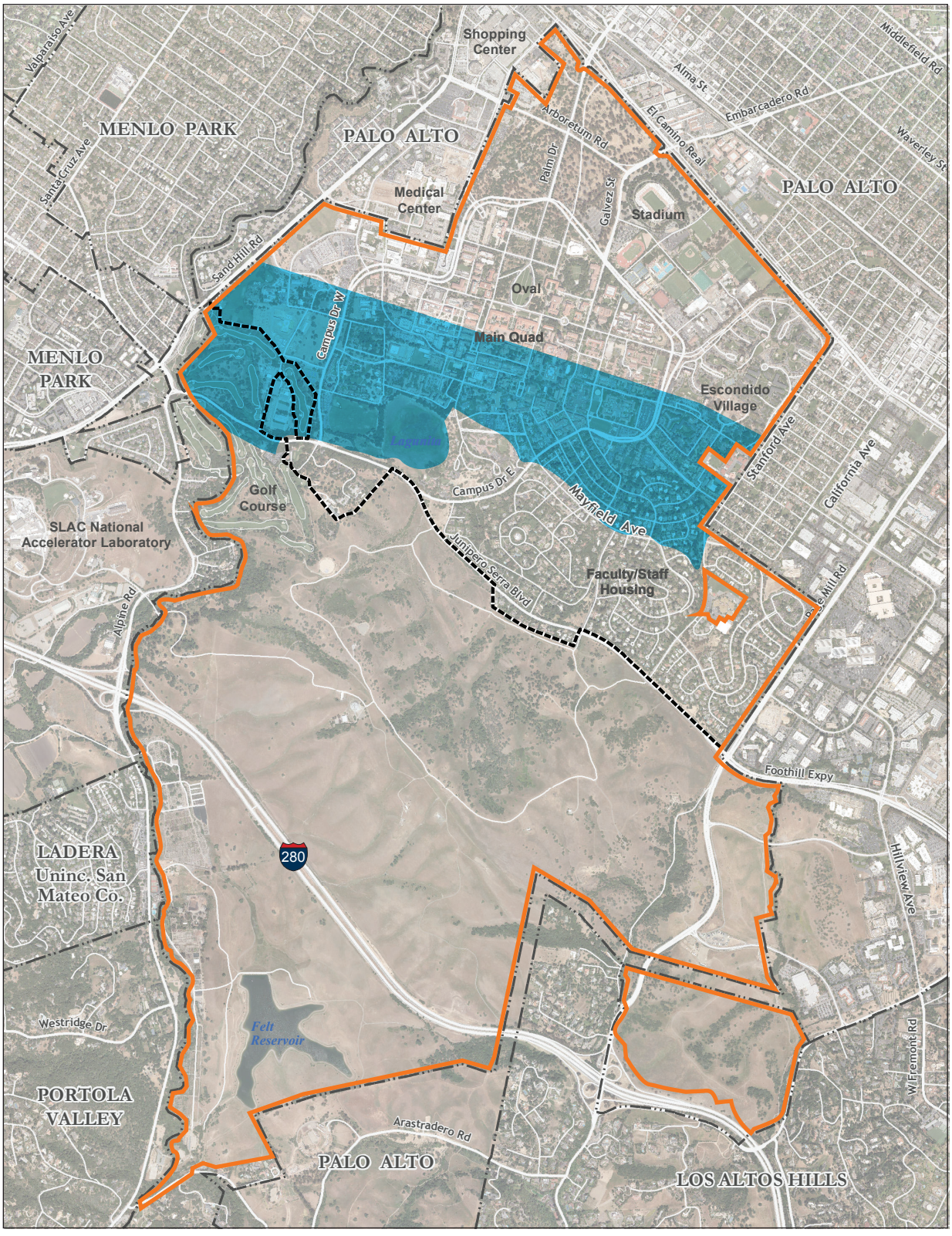
NOTES:
[a] Average of data from 1999 to April 2017
[b] Primary Drinking Water Standard (Public Health Standard)
[c] Secondary Drinking Water Standard (Consumer Acceptance Standard)

SOURCE: Stanford, 2017a

Local Groundwater Recharge

Recharge to the San Francisquito Cone primarily occurs within the bed and banks of San Francisquito Creek. Rainfall and landscape irrigation within the foothills of the Santa Cruz Mountains and Stanford campus lands also percolate into the aquifer. As a condition of the 2000 General Use Permit, Stanford implemented a Campus-wide Plan for Groundwater Recharge to mitigate the loss of recharge areas to development. The groundwater recharge plan identifies an Unconfined Zone, which, as mapped in 2003 by the SCVWD, is an area of the campus where the soils and underlying geologic conditions are conducive to percolation of runoff to the underlying aquifer (Stanford, 2015). As shown in **Figure 5.9-4**, the Unconfined Zone intersects the Project site as a roughly northwest-southeast band.

Pursuant to the groundwater recharge plan, surface water from various sources is conveyed to Lagunita reservoir, which has the greatest recharge capacity on campus. When Lagunita was kept filled year-round, its recharge to the aquifer was estimated to be approximately 700 acre-feet per year (AFY). As indicated above, Lagunita receives stormwater runoff during the winter, and is only augmented with surface water and/or groundwater during CTS breeding periods.



SOURCE: SCVWD, 2018; Stanford LRBE LUEP, 2017

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Figure 5.9-4
Groundwater Recharge Zone

5.9.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

There are no substantive changes anticipated between the existing environmental setting described above and the 2018 baseline environmental setting as it relates to hydrology and water quality. As a result of incremental remaining development on-campus authorized under the 2000 General Use Permit that would be constructed between the existing environmental setting and the 2018 baseline environmental setting (these developments are described in Section 5.0, Approach to Analysis), there would be an associated increase in impervious surfaces within the Project site, and a corresponding decrease in Stanford on-campus detention capacity during that time. It is estimated that under the 2018 baseline environmental setting, Stanford's remaining detention capacity would decrease to approximately 194.0 acres of additional impervious surface area in the Matadero Creek watershed (down from 195.5 acres). Stanford's remaining detention capacity the San Francisquito Creek watershed would decrease to approximately 57.0 acres of additional impervious surface area in this watershed (down from 58.1 acres). Otherwise, the conditions described above for the existing environmental setting are also essentially representative of the 2018 environmental baseline.

5.9.4 Regulatory Setting

Federal

Federal Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. 1251 – 1376) established the basic structure for regulating discharges of pollutants into the waters of the U.S. and gave the U.S. Environmental Protection Agency (USEPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA sets water quality standards for all contaminants in surface waters. The statute employs a variety of regulatory and nonregulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.

The U.S. Army Corps of Engineers (Corps) has jurisdiction over all waters of the U.S. including, but not limited to, perennial and intermittent streams, lakes, and ponds, as well as wetlands in marshes, wet meadows, and side hill seeps. Under Section 401 of the CWA every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards. Compliance with the water quality standards required under Section 401 is a condition for issuance of a Section 404 permit. CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for

development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Generally, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The intent of the Section 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality.

United States Environmental Protection Agency (USEPA)

The USEPA is responsible for implementing federal laws designed to protect air, water, and land. While numerous federal environmental laws guide USEPA's activities, its primary mandate with respect to water quality is the CWA. USEPA has developed national technology-based water quality standards and states have developed water quality standards in accordance with the CWA. USEPA also has authority to establish water quality standards if a state fails to do so. In the National Toxics Rule (NTR) and CTR, USEPA has established such standards for certain toxic pollutants applicable to California waters. These standards are used to determine the amount and the conditions under which pollutants can be discharged.

National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program under the CWA controls water pollution by regulating point and nonpoint sources that discharge pollutants into "waters of the U.S." California has an approved state NPDES program. The USEPA has delegated authority for NPDES permitting to the State Water Resources Control Board (SWRCB), which has nine regional boards. The San Francisco Bay Regional Water Quality Board (RWQCB) regulates water quality in the Project site area and surroundings. Under this system, municipal and industrial facilities are required to obtain a NPDES permit that specifies allowable limits, based on available wastewater treatment technologies, for pollutant levels in their effluent. Stormwater discharges are regulated somewhat differently than pollutant discharges. Discharge of stormwater runoff from construction areas of one acre or more requires either an individual permit issued by the RWQCB or coverage under the statewide Construction General Stormwater Permit for stormwater discharges (discussed below). Specific industries and public facilities, including wastewater treatment plants that have direct stormwater discharges to navigable waters, are also required to obtain either an individual permit or obtain coverage under the statewide General Industrial Stormwater Permit.

State

Porter-Cologne Act

The SWRCB and the RWQCB share the responsibility under the Porter-Cologne Act to formulate and adopt water policies and plans, and to adopt and implement measures to fulfill CWA requirements. In order to meet this requirement for the San Francisco Bay area, the Regional Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (discussed below) was prepared by the RWQCB to protect the water quality of the State according to the beneficial uses identified for each water body. Prior to authorizations of waste discharge by the RWQCB, the Porter-Cologne Act requires reports of waste discharges to be filed. The RWQCB then prescribes Waste Discharge Requirements, which serve as NPDES permits under a provision of the Porter-Cologne Act.

Water Quality Control Plan for the San Francisco Region (Basin Plan)

The RWQCB is responsible for developing and implementing the San Francisco Bay Basin Plan, which documents approaches to implementing State and federal policies in the context of actual water quality conditions. The RWQCB's other activities include permitting of waste discharges and implementing monitoring programs of pollutant effects (as discussed above).

The RWQCB most recently revised the Basin Plan to reflect the adoption of amendments approved by the Office of Administrative Law as of May 4, 2017. The Basin Plan identifies beneficial uses of receiving waters, water quality objectives imposed to protect the designated beneficial uses, and strategies and schedules for achieving water quality objectives. Section 303(c)(2)(B) of the Clean Water Act requires basin plans to include water quality objectives governing approximately 68 of US EPA's list of 126 pollutants.

Water quality objectives are achieved primarily through the establishment and enforcement of Waste Discharge Requirements for each wastewater discharger, as discussed under *Porter-Cologne Act*, above. State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the State. Therefore, all water resources must be protected from pollution and nuisance that may occur from waste discharges. Beneficial uses of surface waters, ground waters, marshes, and mud flats serve as a basis for establishing water quality standards and discharge prohibitions to attain this goal.

Sustainable Groundwater Management Act of 2014

The Sustainable Groundwater Management Act of 2014 (SGMA) became law on January 1, 2015, and applies to all groundwater basins in the state (Water Code Section 10720.3). (The SGMA is comprised of three separate bills: Senate Bill 1168, Senate Bill 1319, and Assembly Bill 1739. All three were signed into law by the Governor on September 16, 2014.) By enacting the SGMA, the legislature intended to provide local agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater within their jurisdiction (Water Code Section 10720.1).

Pursuant to the SGMA, any local agency that has water supply, water management, or land use responsibilities within a groundwater basin may elect to be a "groundwater sustainability agency" for that basin (Water Code Section 10723). Local agencies had until June 30, 2017 to elect to become or form a groundwater sustainability agency. In the event a basin is not within the management area of a groundwater sustainability agency, the county within which the basin is located will be presumed to be the groundwater sustainability agency for the basin. However, the county may decline to serve in this capacity (Water Code Section 19724). As discussed previously, the SCVWD is designated by the DWR as the exclusive Groundwater Sustainability Agency for the Santa Clara Subbasin.

Groundwater authorities will have additional powers under the SGMA to manage groundwater within the basin, including, for example, the power to: conduct investigations of the basin, to require registration of groundwater extraction facilities and metering of groundwater extractions, regulate groundwater extractions from individual groundwater wells or wells generally, and to assess fees on groundwater extractions (see generally, Water Code Section 10725 et seq.). SGMA also provides local agencies with additional tools and resources designed to ensure that the state's groundwater basins are sustainably managed.

The SGMA also requires DWR to categorize each groundwater basin in the state as high-, medium-, low-, or very low priority (Water Code Sections 10720.7, 10722.4).

Construction General Permit

The California Construction Stormwater Permit (Construction General Permit)[4], adopted by the SWRCB, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. The Construction General Permit authorizes the discharge of storm water to surface waters from construction activities. It prohibits the discharge of materials other than stormwater and authorized non-storm water discharges and all discharges that contain a hazardous substance in excess of reportable quantities established at 40 Code of Federal Regulations (CFR) 117.3 or 40 CFR 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre do the following:

- Complete a Risk Assessment to determine pollution prevention requirements pursuant to the three Risk Levels established in the General Permit;
- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the Nation;
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) that will reduce pollution in storm water

[4] *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities,* Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ, National Pollutant Discharge Elimination System No. CAS000002.

discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and

- Perform inspections and maintenance of all BMPs.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

Dewatering Permit

Construction activities such as excavation and trenching in areas with shallow groundwater would require dewatering, which would be subject to the RWQCB construction dewatering permit requirements. Dewatering operations are regulated under State requirements for stormwater pollution prevention and control. Discharge of non-stormwater from a trench or excavation that contains sediments or other pollutants to sanitary sewer, storm drain systems, creek bed (even if dry), or receiving waters without treatment is prohibited. Discharge of uncontaminated groundwater from dewatering is a conditionally exempted discharge by the RWQCB. However, the removed water could potentially be contaminated with chemicals released from construction equipment or sediments from excavation. Therefore, disposal of dewatering discharge would require permits either from the RWQCB for discharge to surface creeks and groundwater or from local agencies for discharge to storm or sanitary sewers. The RWQCB lists non-stormwater discharge controls specifically for dewatering operations. The control measures are described in the mitigation for impacts discussion. Discharge of water resulting from dewatering operations would require an NPDES Permit, or a waiver (exemption) from the RWQCB, which would establish discharge limitations for specific chemicals (if they occur in the dewatering flows).

Regional and County of Santa Clara

San Francisco Bay Region RWQCB Municipal Separate Storm Sewer System (MS4) Permit

Effective January 1, 2016, the RWQCB issued an NPDES Municipal Separate Storm Sewer System (MS4) Permit (Permit No. CAS612008, Order No. R2-2015-0049) to participating jurisdictions that include Santa Clara County. One of the primary objectives of the regulations is for pollutant dischargers to reduce the amount of pollutants in urban stormwater through the use of BMPs. New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) are considered Regulated Projects under this Permit. The MRP requires Regulated Projects, as defined in the MRP (Provision C.3.b.), to implement Low Impact Development (LID) source control BMPs, site design BMPs, and stormwater treatment BMPs, on-site or at a joint stormwater treatment facility, unless the Provision C.3.e alternate compliance applies. Many projects at Stanford would be considered Regulated Projects because they would create or replace 10,000 square feet or more of impervious surfaces. Regulated Projects must provide permanent/post-construction treatment controls for stormwater according to specific calculations (Provision C.3.d.).

In addition, for projects where increased flow and/or volume is likely to cause increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses, MS4 Permit Provision C.3.g requires additional stormwater management controls for compliance with the Hydromodification Management Standard (HM Standard). Stormwater discharges from Hydromodification Projects shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) conditions. A Hydromodification Management Project (HM Project) is a Regulated Project that creates and/or replaces one acre or more of impervious surface and is not specifically excluded in the MRP.

MS4 Permit Provision C.6 also confers authority on local jurisdictions including the County of Santa Clara to implement a construction site inspection and control program at all construction sites to prevent construction site discharges of pollutants into the storm drains. The County conducts inspections to confirm implementation of appropriate and effective erosion and other construction pollutant controls by construction site operators/developers.

All construction sites must implement year-round effective erosion control, run-on and runoff control, sediment control, active treatment systems (as appropriate), good site management, and non-storm water management through all phases of construction (including, but not limited to, site grading, building, and finishing of lots) until the site is fully stabilized by landscaping or the installation of permanent erosion control measures. Each construction sites must have site specific, and seasonally and phase-appropriate, effective BMPs in the following six categories:

- Erosion Control
- Run-on and Run-off Control
- Sediment Control
- Active Treatment Systems, as necessary
- Good Site Management
- Non-Stormwater Management

The County reviews erosion control plans for consistency with local requirements and the appropriateness and adequacy of proposed BMPs for each site before issuance of grading permits for projects. The County also verifies that sites disturbing one acre or more of land have filed a Notice of Intent for permit coverage under the Construction General Permit.

Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

The SCVURPPP is an association of thirteen cities and towns in Santa Clara Valley, the County of Santa Clara, and the Santa Clara Valley Water District (SCVWD) that share a common NPDES permit to discharge stormwater to South San Francisco Bay. Member agencies (Co-permittees) include the cities of Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the County of Santa Clara, and the SCVWD. The Program is organized, coordinated and implemented in accordance with a Memorandum of Agreement (MOA) signed by each Co-permittee. The MOA was signed in 1990 and updated in 1999, 2005 and 2006. It covers the responsibilities of each Co-permittee and provides a cost-sharing formula for joint expenditures. Program by-laws were also updated and approved in 1999.

San Francisquito Creek Joint Powers Authority (SFCJPA)

The cities of Palo Alto, Menlo Park, and East Palo Alto, the County of San Mateo, and the SCVWD formed the SFCJPA in 1999. The SFCJPA works to address flooding, environmental and recreational concerns associated with this watershed, and plan, design, and implement projects from the upper watershed to the Bay tidal marshes. The SFCJPA prepared the San Francisquito Creek Bank Stabilization and Revegetation Master Plan in 2000 covering a 6.5-mile stretch of San Francisquito Creek between Junipero Serra Blvd and U.S. 101, which recommended bank restoration and revegetation techniques for specific sections of this creek. In 2004, the SFJPA commissioned the San Francisquito Watershed Analysis and Sediment Reduction Plan to identify management measures and specific practices to reduce erosion and sediment transport in San Francisquito Creek and its tributaries.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The Stanford Community Plan includes the following strategies and policies relevant to hydrology and water quality:

Health and Safety

Flood Hazards

Strategy #5: Design, Locate, and Regulate Development to Avoid or Withstand Hazards.

Policy SCP-HS 9 **–** Require Stanford to design development and infrastructure improvements, including storm drainage detention facilities, to accommodate runoff from future development so as to achieve no increase in peak flows.

Policy SCP-HS 10 **–** Stanford shall maintain and enhance surface and subsurface drainage systems.

Policy SCP-HS 11 **–** Stanford shall control erosion from future development in order to limit sediment from reaching the storm drain system and creeks, to avoid hydrological impacts.

Implementation Recommendations:

SCP-HS (i)4 **–** The State Division of Safety of Dams shall continue to annually inspect Stanford dams for structural integrity and encourage repairs as needed.

SCP-HS (i)5 **–** Review proposed Stanford projects and require best management practices (BMPs) for reducing erosion at construction sites:

SCP-HS (i)6 **–** Provide public education/information on erosion and drainage issues for university project managers and leaseholders.

SCP-HS (i)7 **–** Construct and maintain storm drainage detention facilities and other improvements as needed to ensure no net increase in downstream flows.

Resource Conservation

Water Quality and Watershed Management

Strategy #4: Reduce Non-Point Source Pollution.

Policy SCP-RC 12 **–** Continue the use of appropriate best management practices to reduce non-point source pollution in agricultural, recreational, and academic areas and for construction activities, and include these practices as terms and conditions of leases of Stanford lands.

Policy **SCP-RC 13 –** In planning for new development and redevelopment, utilize site, building and land-scape design features which serve to reduce non-point source pollution.

Policy **SCP-RC 14 –** Promote and participate in interjurisdictional efforts to identify and reduce non-point source pollution and to develop economically viable best management practices for improving water quality.

Policy **SCP-RC 15 –** Emphasize groundwater recharge through natural percolation and filtration over in-creased runoff to storm drains and creeks.

Implementation Recommendations:

SCP-RC (i)12 **–** Develop education programs for relevant University personnel and for campus lease-holders on water quality issues.

SCP-HS (i)13 **–** Conduct regular maintenance on existing storm water systems.

SCP-HS (i)14 **–** Incorporate conditions within approvals for new development to minimize sources of non-point source pollution and employ best management practices as mitigations.

5.9.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on hydrology and water quality if it would:

a) Violate any water quality standards or waste discharge requirements;

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

c) Substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site;

d) Substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

f) Otherwise substantially degrade water quality;

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or

j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

Approach to Analysis

In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015,[5] the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might impact a project's users or residents, except where the proposed project would significantly exacerbate an existing environmental condition. Accordingly, the identified significance criteria related to placement of housing or structures within a flood hazard area, or exposure of people or structures to risks from failure of levee or dam, are valid only to the extent that the project significantly exacerbates the potential for flooding or for failure of a levee or dam. Nonetheless, potential flooding hazards, and applicable regulatory mechanisms that address these effects, are disclosed in this section.

The potential for impacts related to hydrology and water quality at the Project site were determined by a review of the existing conditions and resources documenting hydrology and water quality conditions from data obtained from FEMA, Department of Water Resources, and data collected by Stanford. Based on the Project characteristics and the Project site location, the proposed 2018 General Use Permit was determined to have no potential impact on significance criterion (g) and (h), above:

> **Place Housing in a 100 Year Flood Hazard Area –** As discussed in the Environmental Setting, there are no identified flood zones located within the Project site boundary. Therefore, the development of new housing that would occur under the proposed 2018 General Use Permit would not be placed within a 100-year flood hazard area Consequently, the Project would have no impact related to this criterion, and it is not discussed further.
>
> **Place Structures in a 100-Year Flood Hazard Area that would Impede or Redirect Flood Flows** – As discussed above, there are no identified flood zones located within the Project site boundary. Therefore, no development that would occur under the proposed

[5] *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal.4th 369. Opinion Filed December 17, 2015.

2018 General Use Permit be placed in a 100-year flood hazard area and potentially impede or redirect flood flows. Consequently, the Project would have no impact related to this criterion, and it is not discussed further.

Impact Evaluation

Construction Impacts

Impact 5.9-1: Project construction could violate water quality requirements or waste discharge requirements, or otherwise degrade water quality. (*Potentially Significant*)

Project construction associated with new development under the proposed 2018 General Use Permit would include earthwork activities such as the stripping of surface vegetation, grading, excavation of soils, and, depending on the individual project and location, potentially the placement of imported engineered soils on a construction site. During construction, existing impervious surfaces and established ground cover that serves to stabilize site soils would be removed in places, potentially resulting in increased erosion and sedimentation.

As required by the NPDES General Construction Activities Permit requirements and or the MS4 Permit, individual projects developed under the 2018 General Use Permit would be required to implement construction BMPs, as detailed in a SWPPP. A SWPPP would include the specific erosion control and storm water quality BMPs that would be employed to minimize pollutants in storm water runoff, the proper methods of installation, and the placement of those BMPs. In addition to erosion control BMPs, a SWPPP also would include BMPs as needed for preventing the discharge of other NPDES pollutants besides sediment (e.g. paint, solvents, concrete, petroleum products) to downstream waters. Project compliance with NPDES General Construction Activities Permit and MS4 Permit requirements are required by law and have proven effective in protecting water quality at construction sites. Routine inspection of all BMPs is required under the provisions of the Construction General Permit and MS4 Permit. In addition, a SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment as would be the case for anywhere that might discharge to San Francisquito Creek.

Given the long history of the Stanford campus, there may be inactive wells on the campus. Inactive wells, if not abandoned appropriately, can present potential conduits for contamination from the surface to underlying groundwater resources. Unless the existing potential conduits are eliminated, this would be a potentially significant impact under the Project. The SCVWD provides oversight for new well construction and well abandonment. Stanford prepared a well survey of all known records to create an inventory/map of possible wells located on campus. This survey was conducted in 2003 and updated in 2007. **Mitigation Measure 5.9-1**, below, would require Stanford to refer to the well survey, prior to obtaining a demolition or grading permit for individual projects to ensure that there are no wells within each building site that might need to be appropriately abandoned to eliminate this pathway for contamination.

The County would require Stanford to apply for County approvals for individual projects under the 2018 General Use Permit. As part of the approval process, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements discussed above, along with any 2018 General Use Permit conditions that must be met regarding stormwater control and management during construction. Implementation of SWPPP requirements, as well as Mitigation Measure 5.9-1, would prevent potentially significant construction-related impacts to water quality, and ensure that all construction activities that would under occur under the 2018 General Use Permit would minimize the potential to adversely affect receiving waters. Therefore, during construction, the potential water quality impacts would be less than significant.

> **Mitigation Measure 5.9-1:** Prior to issuance of a demolition or building permit, Stanford shall review its historic wells survey and confirm that no historic wells not properly closed are located at the project location to determine the potential for encountering any groundwater wells within the area of proposed improvements. If discovered, and the well is no longer part of operations and was not abandoned in accordance with SCVWD requirements, Stanford shall fulfill the well abandonment/destruction permit requirements. Stanford shall contact SCVWD to locate existing inactive wells and confirm adherence to well abandonment/ destruction requirements.
>
> **Significance after Mitigation:** Less than Significant.

Impact 5.9-2: Project construction could include temporary dewatering, but would not substantially deplete groundwater supplies or cause a lowering of the water table. ***(Less than Significant)***

Project construction associated with new development under the proposed 2018 General Use Permit would include excavation of soils related to underground utilities, construction of building foundations, and in some cases, to accommodate underground levels (e.g., for parking). If shallow groundwater were to be encountered during construction, excavations could require temporary dewatering of groundwater to create a dry working environment in order to complete construction.

As discussed in the Environmental Setting, depth to groundwater varies across the Project site and over time but currently ranges between 30 and 60 feet below ground surface within the Academic Growth Boundary. Stanford reports that no subgrade building construction to date within the Project site has encountered groundwater, and consequently, no construction dewatering has been required on-site. (Stanford did, however, encounter groundwater during construction of its new Lucile Packard Children's Hospital building located outside, but in the vicinity of, the Project site.) To address the possibility of rising groundwater at the Project site in the future, in the event that any new subgrade construction under the 2018 General Use Permit would encounter several vertical feet of groundwater necessitating dewatering, Stanford would, as standard practice, stipulate a geologic/geohydrologic analysis be conducted to assess the potential for any localized consolidation/settlement effects, and identify appropriate measures to protect adjacent structures and infrastructure during construction.

Potential construction dewatering would be temporary and only required for the duration of a portion of the construction period. As a result, construction dewatering would not result in long-term, large volume groundwater withdrawal that would lead substantive depletion of groundwater supplies, permanent lowering of groundwater levels, or seasonal basin recharge. Therefore, the potential impact to groundwater supplies and the water table during construction of individual projects under the 2018 General Use Permit would be less than significant.

Mitigation: None required.

Operational Impacts

Impact 5.9-3: Operation of the Project would not violate water quality requirements or waste discharge requirements, or otherwise substantially degrade water quality. *(Less than Significant)*

Development that would occur under the proposed 2018 General Use Permit would result in changes to the amount of impervious surfaces within the Project site. Any increase in the amount of impervious surfaces could generate additional polluted stormwater during storm events. The introduction of new paved areas, building rooftops, parking lots etc., could accumulate and release petroleum hydrocarbons, lubricants, sediments, and metals (generated by the wear of automobile parts), which, if not managed appropriately, could violate water quality standards.

The management of landscaped areas would also present the potential for runoff and/or infiltration of herbicides and pesticides. These types of common urban pollutants could be transported in runoff, potentially adversely affecting the quality of receiving surface waters (in Matadero Creek, San Francisquito Creek, Lagunita, or other surface waters) or groundwater. Nonpoint source pollutants would still be washed by rainwater from rooftops and landscaped areas into onsite and local drainage networks. Potential nonpoint source pollutants include products used in landscaping (e.g., pesticides, herbicides and fertilizers); oil, grease, and heavy metals from automobiles; and petroleum hydrocarbons from fuels.

Pollutant concentrations in stormwater runoff from a particular site would depend on numerous factors, including:

- Land use conditions;
- Implementation of best management practices (BMPs);
- Site drainage conditions;
- Intensity and duration of rainfall; and
- Climatic conditions preceding a rainfall event.

However, existing stormwater management plans and policies, and State Water Board requirements, which implement the federal Clean Water Act regulations, would prevent these potential significant impacts through requirements that minimize the creation of pollution generating surfaces. The Clean Water Act Section 402 NPDES MS4 Permit that covers Santa

Clara County requires stormwater management plans, which in turn require source and treatment control measures. As part of the NPDES program to reduce the severity of impacts, stormwater drainage control/Low Impact Design (LID) measures would be required as standard conditions of approval and building permit application submittals, along with compliance with Municipal Regional MS4 Stormwater Permit Provision C.3 (Provision C.3).

As required by Provision C.3, new Project-related development that would introduce or replace 10,000 square feet of new impervious surfaces would be required to incorporate LID strategies, such as stormwater reuse, onsite infiltration, and evapotranspiration as initial stormwater management strategies. Secondary methods that could be incorporated include the use of natural, landscape based stormwater treatment measures, as identified by Provision C.3. Stormwater treatment measures may also be required in the final design plans in accordance with local stormwater management plans. The treatment measures may vary from "local" improvements at individual building sites to "area wide" concepts such as stormwater treatment wetlands with large open space areas. Treatment control measures may include use of vegetated swales and buffers, grass median strips, detention basins, wet ponds, or constructed wetlands, infiltration basins, and other measures. Filtration systems may be either mechanical (e.g., oil/water separators) or natural (e.g., bioswales and settlement ponds).

As part of the County approval process for individual projects under the 2018 General Use Permit, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements discussed above, along with any 2018 General Use Permit conditions that must be met, regarding stormwater control and management during operation. Adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit would minimize the water quality impact from development that would occur under the 2018 General Use Permit to a less-than-significant level by requiring all proposed development to include stormwater design measures that protect water quality.

Mitigation: None required.

Impact 5.9-4: Project operation could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. (*Potentially Significant*)

The Project site includes a mix of pervious and impervious surfaces. Development that would occur under the proposed 2018 General Use Permit would result in potential changes to the amount of impervious surfaces, potentially reducing the infiltration of stormwater runoff that currently provides groundwater recharge. As discussed in the Environmental Setting, the SCVWD has delineated an area known of the Project site known as the Unconfined Zone, where groundwater recharge by infiltration primarily occurs (as shown in Figure 5.9-4). Under the Project, if additional impervious surfaces were introduced in this area of groundwater recharge the amount of runoff that recharges into the underlying aquifer could be reduced. Also, increased groundwater pumping that could occur under the proposed 2018 General Use Permit could deplete groundwater supplies resulting in a net deficit in aquifer volume.

Under the proposed 2018 General Use Permit, new development would be required to include on-site drainage plans designed to retain, capture and convey increased runoff in accordance with the SCVURPPP design standards and the Municipal Regional MS4 NPDES permit requirements that include Provision C.3 site control features. These requirements generally require the use of LID features such as vegetated swales, permeable paving, use of landscaping for infiltration, and other measures that would retain runoff as much as possible and allow for onsite infiltration. As a result, new development associated with the Project would be required to minimize the amount of stormwater discharge offsite. See also discussion of Stanford's detention facilities in Impact 5.9-6, below, which encourage groundwater recharge.

As discussed in the Environmental Setting, as a condition of the 2000 General Use Permit, Stanford implemented a campus-wide plan for groundwater recharge to mitigate the loss of recharge areas from development that occurs within the Unconfined Zone (see Figure 5.9-4). The general approach for groundwater recharge involves the conveyance of a quantifiable amount of water from Stanford's irrigation water supply to Lagunita reservoir, and the percolation of that water as recharge into the Unconfined Zone. Lagunita reservoir has a high infiltration rate and groundwater recharge there has been demonstrated to be very effective. According to recharge monitoring, this recharge strategy has resulted in recharge levels that have consistently exceeded recharge loss by a factor of 100 (Stanford, 2015). As identified in **Mitigation Measure 5.9-4**, below, continued implementation of this groundwater recharge plan with annual reporting to the County would ensure that future development that would occur in the Unconfined Zone under the 2018 General Use Permit would not result in adverse effects to underlying groundwater levels.

As under baseline conditions, under the proposed 2018 General Use Permit Stanford's groundwater wells would be used to supplement local surface water sources for the non-potable landscape irrigation system and, if needed, for the Lagunita reservoir to maintain water levels; and are only anticipated to be used for the domestic water system as an emergency water source. Also, as under baseline conditions, under the Project Stanford would operate within its secured water rights for surface water diversion for non-potable uses. Individual developments that would occur under the proposed 2018 General Use Permit would have varying effects on landscape irrigation needs, depending on the type of development and what is replaced. Development that would replace currently landscaped areas with buildings and/or pavement would cause irrigation needs to decrease, whereas similar development that would replace paved surface parking lots or non-landscaped areas with landscaping would require increased irrigation. While, as discussed in the Environmental Setting, non-potable irrigation usage fluctuates from year to year at Stanford, over time this usage remained relatively constant as the 2000 General Use Permit was implemented.

Under the proposed 2018 General Use Permit, it is expected that the nature of new development would be similar to past development on the campus, and therefore irrigation demand under the 2018 General Use Permit is not expected to substantively change from baseline conditions. It should also be noted that Stanford would, as under baseline conditions, include the use of low-water-demand native plants in landscaped areas of the campus, minimizing the non-potable water demand. Finally, it is estimated that the projected annual non-potable water use that would occur over the duration of the proposed 2018 General Use Permit could be safely withdrawn without causing excessive drawdown in the aquifer (Schaaf & Wheeler, 2017).

As indicated in the Environmental Setting, depth to groundwater ranges between 30 and 60 feet below ground surface within the Academic Growth Boundary. As discussed in Impact 5.9-2 above, Stanford reports that no subgrade building construction to date within the Project site has encountered groundwater. However, if needed to address the possibility of rising groundwater at the Project site in the future, Stanford indicates its preference would be to strengthen building foundations to withstand the hydrostatic pressures and waterproofing the structure appropriately. This would avoid any potential localized effects on groundwater levels from conducting long-term groundwater dewatering via pumping for new buildings, and correspondingly, avoid adding extracted groundwater to the storm drain system.

As part of the County approval process for individual projects under the proposed 2018 General Use Permit, the County would require Stanford to demonstrate compliance with any 2018 General Use Permit conditions that must be met, regarding groundwater use and recharge during operation. Therefore, the drainage control requirements, the projected use of groundwater wells, and the implementation of the Groundwater Recharge plan as identified in Mitigation Measure 5.9-4, would assure onsite infiltration such that development that would occur under the 2018 General Use Permit would not substantively reduce the aquifer volume or lower the local groundwater level. The potential impact would therefore be less than significant.

> **Mitigation Measure 5.9-4:** Stanford Utilities shall review individual projects proposed under the 2018 General Use Permit for changes in impervious surface area within the Unconfined Groundwater Zone. The accounting of the recharge effort shall be tracked to ensure that all future development will continue to result in an annual net positive recharge in the Unconfined Groundwater Zone. Record of monitored data shall be submitted to the County on an annual basis and Santa Clara Valley Water District and include both water volumes and water quality data.
>
> **Significance after Mitigation:** Less than Significant.

Impact 5.9-5: Project development would potentially alter the drainage pattern of the Project site, but would not result in substantial erosion or siltation on or off the site. (*Less than Significant*)

As mentioned above, individual developments that would occur under the proposed 2018 General Use Permit would result in localized changes in drainage patterns in the vicinity of the building site, and if not managed appropriately could create new impervious surfaces that would increase the amount of surface run-off. Potential concentrated runoff could cause erosion of exposed soils resulting in sedimentation and siltation of discharge flows on- or off-site.

As discussed in Impact 5.9-3, above, each individual development that would occur under the proposed 2018 General Use Permit would be constructed in accordance with local, regional and state drainage control requirements that include LID measures such as vegetated swales, permeable paving, use of landscaping for infiltration, detention basins, and other measures (e.g., stormwater capture/reuse) that would limit the ability of stormwater pollutants to be discharged offsite. The new development would include design standards consistent with local requirements

and a Storm Water Management Plan as required by the Municipal Regional NPDES MS4 permit which has pollutant source control features such as use of landscaped areas for infiltration of stormwater, permeable paving, and treatment planters. The SCVURPPP program has drainage standards which require detention of stormwater in order to control runoff rates which in turn reduces the potential to cause erosion or siltation. As described above in the Environmental Setting section, the existing on-site detention basins have substantial capacity to serve future development under the 2018 General Use Permit (also discussed below).

Implementation of these design features in accordance with drainage control requirements have proven effective in controlling erosion potential and minimizing transport of siltation on or off site. Therefore, localized changes in on-site drainage patterns associated with development under the 2018 General Use Permit would not result in substantial erosion or siltation, and with adherence to stormwater control measures as a part of the Municipal Regional NPDES MS4 stormwater permit the potential impact is considered less than significant.

Mitigation: None required.

Impact 5.9-6: Project development would create runoff, but would not exceed the capacity of existing or planned stormwater infrastructure, or result in flooding on- or off-site. (*Less than Significant*)

New buildings and infrastructure improvements, such as sidewalks and driveways, that would be developed under the 2018 General Use Permit could increase impervious surfaces within the Project site. In turn, any substantive increase in impervious surface area could result in an increase in peak flows in, and potentially exceed the capacity of, the downstream storm drainage infrastructure, potentially exacerbating existing or creating new flooding conditions.

In order to accommodate post-development increases in runoff from new development under the proposed 2018 General Use Permit, each individual project would be required to develop a drainage plan that complies with the County's drainage design standards and the requirements of the SCVURPPP including flow control, and NPDES Provision C.3 requirements for storm capacity minimums. The County's drainage design standards require that project stormdrainage infrastructure be designed to adequately convey all runoff from peak storm events. Any potential increases in stormwater runoff resulting from additional impervious surfaces must be detained to ensure peak flows do not result in on-site or downstream flooding.

As discussed in the Environmental Setting, as a condition of the 2000 General Use Permit, Stanford is required to implement facilities to ensure that peak storm runoff from development authorized by the 2000 General Use Permit would not increase or cause downstream flooding. As discussed in the Environmental Setting, Stanford developed on-site detention facilities on a watershed basis to create sufficient capacity to offset increased runoff associated with all new impervious surfaces constructed under the 2000 General Use Permit. The majority of the detention capacity is provided by recreational fields that Stanford has developed to serve Stanford recreational needs, but which also serve to provide stormwater detention. As discussed under

2018 Baseline Environmental Setting, by 2018, the existing detention facilities are estimated to have the capacity for accommodating an additional approximate 57.0 acres (2.48 million square feet) of impervious surfaces in the San Francisquito watershed, and an additional approximate 194.8 acres (8.48 million square feet) of impervious surfaces in the Matadero watershed. In accordance with Stanford Community Plan Policy SCP-HS 9, all development would require infrastructure improvements to accommodate runoff so as to achieve no increase in peak flow rate. This remaining detention capacity would be more than adequate to accommodate the net increase in impervious surfaces that would occur under the 2018 General Use Permit.

As part of the County approval process for individual projects under the proposed 2018 General Use Permit, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, along with any 2018 General Use Permit conditions that must be met, regarding stormwater control and management during operation. Pursuant to the County-approved Stanford Storm Drainage Master Plan, Stanford reports to the County annually regarding the remaining capacity for the existing detention basins. The detention basins are designed to accommodate the 100-year design storm flow. Mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements, as required by law, would ensure that proposed development under the proposed 2018 General Use Permit would include storm drainage control features, including potential detention facilities and features that promote onsite infiltration. As such, Project effects on increases in peak runoff and capacity of existing or planned stormwater infrastructure would be considered less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 5.9-7: The Project, in combination with past, present, and future projects could potentially contribute to surface and groundwater quality impacts. ***(Potentially Significant)***

The geographic scope of potential hydrology and water quality impacts are the study watersheds. Construction and operation of the proposed development under the 2018 General Use Permit, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively increase stormwater runoff and pollutant loading in the study watersheds, and hence, to the San Francisco Bay. Construction related to the Project in combination with other cumulative development, could also affect groundwater quality. Development associated with the proposed Project and other current and future projects in the watersheds would be required to comply with current construction, drainage and grading requirements intended to control runoff and regulate water quality at each site. Additionally, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. New development projects in the study watersheds in Santa Clara and San Mateo Counties also would be required to comply with the regionally based MS4 NPDES permitting requirements. All construction work disturbing more than one acre in the surrounding areas would require permits from the RWQCB which require all activities to implement BMPs to

minimize adverse effects to water quality. The NPDES permits, both the General Construction Permit and the MS4, are based upon addressing cumulative contributions to a watershed and as a result include requirements to implement BMPs that protect water quality to the maximum extent practicable. Further, Mitigation Measure 5.9-1 would serve to minimize any Project contribution significant cumulative effects on groundwater quality. Therefore, the effect of the Project on surface and groundwater quality, in combination with other cumulative projects, would be less than significant.

Mitigation: Implement Mitigation Measure 5.9-1.

Significance after Mitigation: Less than Significant.

Impact 5.9-8: The Project, in combination with past, present, and future projects could potentially contribute to depletion in groundwater supplies or interfere with groundwater recharge. ***(Potentially Significant)***

Construction and operation of the proposed development under the 2018 General Use Permit, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively decrease groundwater supplies and interfere with groundwater recharge. As discussed in the Environmental Setting, the Santa Clara Valley Groundwater Basin is not currently in an overdraft condition and is actively managed by the SCVWD. The SCVWD is designated by the DWR as the exclusive Groundwater Sustainability Agency (GSA) for the Santa Clara Subbasin, which comprises a portion of the larger Santa Clara Valley Basin. A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. A GSA must submit and implement a GSP or prescribed alternative under the Sustainable Groundwater Management Act of 2014. The SCVWD submitted the 2016 Groundwater Management Plan for the Santa Clara and Llagas Subbasins to DWR as an Alternative to a GSP in December 2016. Stanford will also continue implementation of the Campus-wide Plan for Groundwater Recharge, as specified in Mitigation Measure 5.9-4, above, to ensure that any loss of recharge areas due to new Project development is addressed through management of Lagunita reservoir as described above. Therefore, considering the projected use of groundwater for the Project, the proposed landscaping vegetation, current and future management of the groundwater basin and continued adherence to the groundwater recharge plan as overseen by SCVWD, there would be a less than significant cumulative impact to groundwater levels or supplies.

Mitigation: Implement Mitigation Measure 5.9-4.

Significance after Mitigation: Less than Significant.

Impact 5.9-9: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative surface hydrology impacts. (*Less than Significant*)

Implementation of the 2018 General Use Permit, together with past present and other reasonably foreseeable future projects in the vicinity, could also expose people and/or property to flooding from a 100-year event. These effects could occur through increases in stormwater runoff volumes that overwhelm drainage infrastructure or during high tide in a 100-year storm event along with sea level rise in the Bay. The proposed Project and other cumulative projects in the vicinity would be required to comply with flood control requirements intended to provide flood protection. Additionally, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. New development projects in the County also would be required to comply with County flood control requirements. As discussed above, the proposed Project itself would involve structural measures designed to convey stormwater flows through improvements to existing infrastructure such that runoff volumes do not exceed existing flows during peak storm events. Therefore, the Project, in combination with other cumulative projects, would not result in a significant cumulative impact to people and/or property from a 100-year event. The Project would have a less than cumulatively considerable impact, and cumulative effects, therefore, would be less than significant.

Mitigation: None required.

5.9.6 References

Federal Emergency Management Agency (FEMA), *Flood Insurance Rate Map (FIRM), Santa Clara County, Map Number 06085C0016H*, May 18, 2009.

Northwest Hydraulic Consultants (NHC) and Jones and Stokes Associates (J&S), *San Francisquito Creek Watershed Analysis and Sediment Reduction Plan,* May 2004.

Stanford University, *Water Quality Data Memorandum for 2018 General Use Permit*, April 26, 2017a.

Regional Water Quality Control Board; *Section 303(d) and Section 305(b) Integrated Report*, approved April 12, 2017.

Stanford University, *Campus-wide Plan for Groundwater Recharge (Final),* May 2015.

Stanford University, *Utilities Division and Land Use Environmental Planning, Storm Drainage Detention Capacity Summary – Annual Report # 16*, updated February 16, 2017b.

Schaaf & Wheeler Consulting Civil Engineers and Stanford (Schaaf & Wheeler), *Water Supply Assessment for the Stanford 2018 General Use Permit,* November 2016 revised April 2017.

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5.10 Land Use and Planning

5.10.1 Introduction

This section describes the potential for land use and planning impacts, as well as agriculture and forestry impacts, as a result of construction activities and campus operations under the proposed 2018 General Use Permit. This section includes a description of the existing and 2018 baseline environmental settings related to land use plans applicable to the Project site, and presents a discussion of applicable federal, State, and County regulations. This section presents the significance criteria used to evaluate impacts on land use and planning, and agriculture and forestry as a consequence of implementing the Project, and the results of the impact assessment, including any significant impacts and associated mitigation measures.

5.10.2 Existing Environmental Setting

Stanford is located on the San Francisco Peninsula, approximately 35 miles southeast of San Francisco, and 20 miles northwest of San José. Stanford owns approximately 8,180 contiguous acres that lie within the boundaries of six governmental jurisdictions, including unincorporated areas of Santa Clara County and San Mateo County, the cities of Palo Alto and Menlo Park, and towns of Portola Valley and Woodside (see **Figure 3-2** in Chapter 3, Project Description). The Project site consists of 4,017 acres of Stanford lands under the jurisdiction of the County of Santa Clara (see **Figure 3-3** in Chapter 3, Project Description).

Stanford Lands Under County Jurisdiction

The Project site broadly consists of the Stanford central campus and the Stanford foothills. Stanford's central campus, including academic and academic support facilities and housing, is concentrated north of Junipero Serra Boulevard and located within Stanford's Academic Growth Boundary (see below under "Stanford Community Plan" for discussion of the Academic Growth Boundary). The largely undeveloped Stanford lands within the foothills south of Junipero Serra Boulevard are located outside of Stanford's Academic Growth Boundary.

The Stanford campus within the Academic Growth Boundary includes a diverse mix of land uses, including classrooms, academic offices, laboratory space, athletic venues, museums, performance and arts venues, lands for outdoor learning, student housing, faculty/staff housing, support facilities, and open spaces.

The mostly undeveloped Stanford foothills within the Project site include a mixture of grasslands, woodlands, and riparian areas. The Stanford foothills also support livestock grazing and other agricultural uses, academic facilities, a portion of the Stanford Golf Course, and public and private trails. Within unincorporated Santa Clara County, Interstate 280 (I-280) and Page Mill Road are the two major roads that divide the Stanford foothills.

Agriculture and Forestry Resources

The Stanford foothills support limited agricultural uses such as livestock grazing, plant/tree nurseries, and agricultural research activities. Most of Stanford lands within the Academic Growth Boundary are designated as Urban and Built-Up Land by the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (FMMP), which is described in greater detail in the Regulatory Setting, below. The remainder of lands within the Academic Growth Boundary and the foothills are designated under the FMMP as Other Land. The nurseries and equestrian facilities located near Felt Reservoir along Los Trancos Creek are designated by the FMMP as Unique Farmland (DOC, 2016a). According to the Williamson Act map for Santa Clara County, no lands within the 2018 General Use Permit boundary are subject to a Williamson Act contract (DOC, 2016b); see description of Williamson Act under Regulatory Setting, below. In addition, the Project site does not include lands designated or classified as forest land or timberland, as determined by the California Public Resources Code; see Regulatory Setting, below.

Adjacent Land Uses

Areas bordering the Project site include Stanford lands and non-Stanford lands under the jurisdiction of the cities of Palo Alto and Menlo Park, towns of Portola Valley and Los Altos Hills, and San Mateo County. Adjacent land uses include residential and commercial uses as well as Stanford uses such as the Stanford Research Park, Stanford University Medical Center, Stanford Shopping Center, and the SLAC National Accelerator Laboratory.

City of Palo Alto

Stanford lands includes 1,161 acres of land adjacent to the Project site under the jurisdiction of Palo Alto. These lands include the Stanford Research Park, Stanford University Medical Center, the Palo Alto Transit Station, and Stanford Shopping Center, as well as multi-family residential areas between Sand Hill Road and San Francisquito Creek. Non-Stanford lands that border the Project site in Palo Alto include the College Terrace residential neighborhood east of Stanford Avenue, and areas north of El Camino Real, including the Southgate residential neighborhood, Palo Alto High School, Escondido School, Lucille M. Nixon School, Town and County Shopping Center, and the Palo Alto Medical Foundation.

City of Menlo Park

Stanford land under the jurisdiction of Menlo Park that borders the Project consists of a narrow strip of land that is part of the Stanford Golf Course near the intersection of Sand Hill Road and Santa Cruz Avenue, and southerly along Alpine Road, as well as the Stanford Hills subdivision.

Town of Portola Valley

A small portion of the Project site, southwest of Felt Reservoir in the foothills, is adjacent to the Town of Portola Valley, which is south of I-280 and west of Los Trancos Creek. This area consists of low-density residential uses as well as 76 acres owned by Stanford that includes equestrian facilities.

Los Altos Hills

Residential areas in Los Altos Hills along Page Mill Road and Arastradero Road border the foothills near the southwestern portion of the Project site.

San Mateo County

Areas of unincorporated San Mateo County adjacent to the Project site include a portion of the Stanford Golf Course, a small residential area between the golf course and Alpine Road, the Ladera residential neighborhood, and the SLAC National Accelerator Laboratory.

5.10.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing would not be completed and occupied until approximately 2020. All remaining academic and academic support and housing development to be built under the 2000 General Use Permit, including the EV Graduate Residences, are located within Stanford's Academic Growth Boundary. As applicable, these developments have completed or are pending approval from the County through its Architecture and Site Approval process. Accordingly, the land use changes associated with these developments are considered as part of the 2018 environmental baseline. Similarly, the 2018 environmental baseline also includes all other applicable approved offsite development and infrastructure in the study area anticipated to be built and occupied by 2018.

5.10.4 Regulatory Setting

Federal

There are no relevant federal regulations regarding land use, planning, forestry, or agriculture applicable to the proposed Project. State and County of Santa Clara regulations are described below.

State

California Farmland Mapping and Monitoring Program (FMMP)

As initially mentioned above, the DOC's FMMP provides a classification system based on technical soil ratings and current land use. The FMMP is an informational service only and does not have regulatory jurisdiction over local land use decisions (DOC, 2017). Important Farmland maps classify land into the following categories: Prime Farmland, Farmland of Statewide

Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-up Land, and Other Land. The designations for Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are defined together under the terms "Agricultural Land" and "Farmland" in Public Resources Code Section 21060.1 and CEQA *Guidelines*, Appendix G.

California Public Resources Code (PRC)

The California PRC governs forestry, forests, and forest resources, as well as range and forage lands, within the State. "Forest land" is defined by PRC Section 12220(g) as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." "Timberland" is defined by PRC Section 4526 as "land, other than land owned by the federal government..., which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees."

California Government Code

Chapter 6.7 of the Government Code (Sections 51100-51155) regulates timberlands within the state. "Timberland production zone" is defined in Section 51104(g) as an area that has been zoned pursuant to Government Code Section 51112 or 51113, and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses. In this context, "compatible uses" include any use that "does not significantly detract from the use of the property for, or inhibit, growing and harvesting timber" (Government Code Section 51104(h)). The general plans of cities and counties may use the term "timberland preserve zone," which Government Code Section 51104(g) defines as equivalent to "timberland production zone."

California Land Conservation Act of 1965 (Williamson Act)

The Williamson Act is intended to reduce economic incentives to convert open spaces and agricultural land to developed uses through voluntary contracted agreements in which the property owner is granted property tax reductions in exchange for maintaining existing agricultural or open space uses of the property (Government Code Section 51200 et seq.). The Williamson Act is a State program implemented at the county level that allows agricultural landowners to contractually agree to retain land included in an agricultural preserve in agricultural or and open space uses for a period of 10 years and, in return, to pay reduced property taxes. The term of the contract automatically renews each year unless not renewed or cancelled, so that a contract always has a 10-year period left.

County of Santa Clara

The County of Santa Clara currently regulates land uses on Stanford lands within its jurisdiction through several mechanisms, including the 2000 General Use Permit, Stanford Community Plan, the County Zoning Ordinance, and the 1985 Land Use Policy Agreement between the County of Santa Clara, City of Palo Alto, and Stanford. These mechanisms, as well as the County's Architecture and Site Approval process, are discussed below.

2000 General Use Permit

The most recent General Use Permit was approved in 2000 and is the implementation document that permits additional academic facilities and housing units, and establishes conditions of approval for development of Stanford lands in unincorporated Santa Clara County, consistent with the goals, strategies, and policies of the Stanford Community Plan. Key functions of the 2000 General Use Permit are to establish the allowed land uses, specify the quantity of new academic and academic support space and related infrastructure that may be constructed; specify the quantity of housing units and student beds that may be constructed; and identify conditions of approval that apply to new construction and campus operations to minimize effects to the surrounding community and environment.

As described in Chapter 3, Project Description, the 2000 General Use Permit divides the Project site into ten development districts in which the distribution of development within the campus is estimated (see **Figure 3-5**). Nine of the development districts are located within the Academic Growth Boundary: Campus Center, Quarry; Arboretum; Department of Athletics, Physical Education, and Recreation (DAPER) and Administrative; East Campus; San Juan; Lagunita; Lathrop; and West Campus. The tenth district includes lands outside the Academic Growth Boundary in the Foothills Development District. Under the 2000 General Use Permit new academic and academic support space can be constructed in any of the development districts within the Academic Growth Boundary except the Arboretum Development District.

The 2000 General Use Permit includes more than 100 conditions regulating construction activities and campus operations, establishes monitoring requirements and identifies project approval processes. The County Planning Office prepares annual reports documenting Stanford's development activity and compliance with the 2000 General Use Permit.

Stanford Community Plan

The Stanford Community Plan was adopted in 2000 as a component of the Santa Clara County General Plan. The Stanford Community Plan augments the County General Plan and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

The Academic Growth Boundary is the primary mechanism for promoting compact urban development and resource conservation on the Stanford campus and defines the allowable development for areas within and outside the Academic Growth Boundary. In general, all uses associated with the educational and residential function of the campus are directed inside the Academic Growth Boundary (i.e., within the central campus), while areas outside the Academic Growth Boundary (i.e., within the foothills) are reserved for open space and academic activities that require the foothill setting for their basic functioning. Under the Stanford Community Plan a four-fifths vote of the County Board of Supervisors is required to alter the Academic Growth Boundary until 2025. Such an alteration may only be triggered if Stanford reaches 17.3 million square feet of academic and support facilities and student housing. This amount of square footage represents the 12.3 million square feet of academic and student housing facilities that existed in 2000, plus an additional five million square feet of growth estimated by multiplying Stanford's historic growth rate of 200,000 square feet per year by 25 years. After 2025, the Academic Growth Boundary will

continue to remain in place unless amended by a majority vote of the Board of Supervisors. Some of the applicable policies from the Community Plan's Growth and Development chapter are listed below.

Policy SCP-GD 1 **–** Establish and maintain an Academic Growth Boundary (AGB) as shown on Figure 1.3. Direct future development on Stanford lands within the AGB, consistent with the Community Plan land use designations.

Policy SCP-GD 2 **–** Retain the location of the AGB as shown in Figure 1.3 for at least 25 years, and until the building area of academic and support facilities and student housing reaches 17,300,000 square feet.

Policy SCP-GD 3 **–** Allow modification of the location of the AGB within 25 years of its initial approval only upon a four-fifths vote of the Board of Supervisors.

Policy SCP-GD 4 **-** The design and intensity of growth within the AGB should facilitate transit usage. There should be a mixture of uses to allow for a high degree of pedestrian and bike trips. The location of uses should facilitate non-auto trips.

Policy SCP-GD 5 **–** The design and intensity of development outside the AGB should be very low intensity supporting academic field research, research needing remote locations, agricultural and recreational uses.

Policy SCP-GD 6 **–** Incremental additional development within the AGB may only be permitted through a General Use Permit approved by the County.

The Stanford Community Plan established land use designations and allowable development within the Community Plan area. **Figure 3-6**, in Chapter 3, Project Description, illustrates existing land use designations for the Stanford campus as specified in the Stanford Community Plan. Land use designations within the Academic Growth Boundary include Academic Campus; Campus Residential (both Low and Medium Density); and Campus Open Space. Land use designations outside the Academic Growth Boundary include Open Space and Field Research; and Special Conservation Areas. The plan also includes the Public School designation, which applies to two parcels owned by the Palo Alto Unified School District and occupied by existing elementary schools (Lucille M. Nixon and Escondido). However, as shown on Figure 3-6, both schools are located outside the 2018 General Use Permit boundary. Descriptions of the Stanford Community Plan land use designations, and applicable development policies, are included below.

Academic Campus

The Academic Campus land use designation applies to lands in current or intended academic use. Academic use includes both facilities used for teaching or research activities and uses which support academic activity, such as administrative offices, athletic facilities, student housing, and student and administrative support services. This designation provides Stanford with the flexibility to locate these uses in relation to one another according to Stanford's programmatic needs. Allowable uses include the following: instruction and research; administrative; student housing; high density housing for faculty and staff; athletics, physical education, and recreation; support services (e.g., child care and bookstore); infrastructure, storage, and maintenance;

Stanford-affiliated cultural facilities; and Stanford-affiliated non-profit research institutions. Academic Campus development policies are listed below.

Academic Campus Development Policies

Policy SCP-LU 3 **–** Development intensity of individual facilities may vary with the type of allowed use. Maximum cumulative development amounts are permitted through the Stanford General Use Permit, consistent with the AGB threshold amount of development. Housing for faculty and staff at densities above 15 units per acre may be developed.

Policy SCP-LU 4 **–** Development must be consistent with the 1985 Land Use Policy Agreement, amended as needed, with regard to allowable uses and provision of services.

Campus Residential – Low Density

The Campus Residential-Low Density designation applies to lands immediately adjacent to the Academic Campus area that have a low-density residential character and are used for housing faculty and staff. This designation applies to existing low-density residential neighborhoods and new residential areas where lower density of development is desired for compatibility with adjacent development. Allowable uses include single-family housing, duplexes and townhouses for faculty and staff; and residential support services (e.g., child care and neighborhood-serving convenience commercial facilities). Campus Residential-Low Density development policies are listed below.

Campus Residential – Low Density Development Policies

Policy SCP-LU 8 **–** Residential density up to 8 units per acre is permitted, with potential for clustering individual units to provide public or private open space. This residential density yields a population density up to 19 persons per acre.

Policy SCP-LU 9 – Residential support uses shall be of a scale consistent with and appropriate to the surrounding neighborhood.

Campus Residential – Medium Density

The Campus Residential-Medium Density designation applies to lands immediately adjacent to the Academic Campus area that have a higher density residential character and are used for housing faculty and staff. This designation applies primarily to new residential areas that provide opportunities for a more compact development pattern than the existing single-family residential neighborhoods. Allowable uses include single-family housing, duplexes, condominiums, flats, apartments, and townhouses for faculty and staff; and residential support services (e.g., child care and convenience commercial facilities). Campus Residential-Medium Density development policies are listed below.

Campus Residential – Medium Density Development Policies

Policy SCP-LU 12 – Residential density between 8 and 15 units per acre is permitted, with potential for clustering individual units to provide public or private open space. This residential density yields a population density between 19 and 36 persons per acre.

Policy SCP-LU 13 – Residential support uses shall be of a scale consistent with and appropriate to the surrounding neighborhood.

Campus Open Space

The Campus Open Space designation includes the areas along Palm Drive, the Oval, the Arboretum, and Lagunita. It also applies to designated parks within faculty and staff residential neighborhoods and to important and substantial resource conservation areas such as wetlands or habitat conservation areas within the central campus. Uses must retain land in open space, and must be consistent with the individual character of each area included in this designation. These areas shall be maintained as parklike areas, unimproved open space, landscape buffers, riparian corridors, and conservation areas. Temporary activities of a limited nature that are in keeping with the open space character are also permitted. Examples include limited duration special events or general recreational activities, such as those regularly occurring in the Oval area. Campus Open Space development policies are listed below.

Campus Open Space Development Policies

Policy SCP-LU 16 – No new permanent, above ground buildings or structures for occupancy are permitted. Landscaping structures or features, such as walls, fences, arbors, fountains, and statues or other forms of public art, are allowed.

Policy SCP-LU 17 – Temporary structures associated with appropriate temporary activities may be allowed, such as concession stands, tents, or similar structures. However, no temporary use which results in the degradation of biological resources is permitted.

Public School

This designation applies to land intended for use as a public school. The use of these lands is limited to public school facilities, including appropriate buildings, parking, playgrounds, and athletics fields. Public School development policies are listed below.

Public School Development Policies

Policy SCP-LU 20 – Stanford and the appropriate school district shall make every effort to develop school sites in an efficient manner consistent with the environmental setting of the site.

Policy SCP-LU 21 – Stanford and each school district shall seek and promote opportunities for cooperative use of facilities, as appropriate.

Policy SCP-LU 22 – If Stanford land used for a public school is no longer required for school use at any time in the future, it may be converted to another use by the University if re-designated for the intended use through the General Plan amendment process.

Open Space and Field Research

The Open Space and Field Research designation applies to undeveloped lands outside the Academic Growth Boundary. Allowable uses within this designation include the following: field study activities; utility infrastructure in keeping with natural appearance of the foothills; grazing and other agriculture uses; recreational activities consistent with protection of environmental resources; specialized facilities and installations that by their nature require a remote or natural setting (e.g., astronomical or other antennae installations); and environmental restoration. Open Space and Field Research development policies are listed below.

Open Space and Field Research Development Policies

Policy SCP-LU 27 – No permanent buildings or structures are allowed, other than utility infrastructure and a limited number of small, specialized facilities or installations that support permitted or existing activities, or require a remote, natural setting and cannot be feasibly located within the AGB.

Policy SCP-LU 28 – Existing non-conforming uses within this designation, such as the golf course, may continue indefinitely. Remodeling or reconstruction of existing facilities after a natural disaster may be allowed, but no further expansion is permitted. Modification of the configuration of the golf course generally within its existing boundaries is permitted.

Policy SCP-LU 29 – Allowable development shall be clustered as feasible, primarily in areas with low environmental sensitivity, to preserve expanses of open space, environmentally sensitive areas, and scenic vistas.

Policy SCP-OS 2 – Allow only field research and other uses that require a remote or foothill setting for their functioning in areas outside the Academic Growth Boundary. Do not permit any new development that is not associated with such uses (see Land Use Chapter).

Special Conservation Areas

The Special Conservation Areas designation applies to lands south of Junipero Serra Boulevard that is deemed unsuitable for development due to natural resource constraints. Accordingly, no physical development other than that which supports conservation efforts may occur in these areas. The use of these areas is limited to conservation activities and habitat management, field environmental studies, and appropriate agricultural uses. Recreational use may be allowed if it is consistent with the particular environmental constraints of an area. Access for recreational use may be restricted. Special Conservation development policies are listed below.

Special Conservation Development Policies

Policy SCP-LU 32 – No new permanent development in the form of buildings or structures is allowed, other than construction, modification, and maintenance of improvements to support conservation efforts. Existing non-conforming uses are allowed to remain, in accordance with the County's requirements for non-conforming structures.

Special Conservation Development Policy SCP-LU 33 required Stanford to prepare a Special Conservation Plan for the Special Conservation Areas to provide guidelines addressing habitat management within the area for 25 years, among other issues. This policy has been implemented with Stanford's completion and the County Planning Office's approval of the *Stanford University Special Conservation Area Plan* (Stanford, 2015).

County of Santa Clara Zoning Ordinance

The County of Santa Clara Zoning Ordinance implements the Santa Clara County General Plan, and regulates land use and development within the unincorporated areas of Santa Clara County. The current County zoning districts on Stanford lands are illustrated in **Figure 3-7** in Chapter 3, Project Description. Zoning districts include General Use (A1); Low-Density Campus Residential (R1S); Medium-Density Campus Residential (R3S); and Open Space and Field Research (OS/F). Descriptions of the Stanford zoning districts are included below.

General Use (A1)

The portion of the Stanford campus that is developed with academic and support facilities and student housing is zoned A1. According to the Zoning Ordinance, the purpose of the A1 district is to "provide a flexible base zoning district that allows general residential and agricultural uses, and provides opportunities through the use permit process for other uses and developments that are appropriate for a particular location, consistent with the objectives, goals and policies of the general plan" (Section 2.50.101). The Al zoning district applied to Stanford requires that a use permit, i.e., the General Use Permit, be granted for development and operation of academic activities.

Allowable uses within the A1 district include the following: agriculture, commercial, residential, schools, colleges and vocational schools, recycling, and retail with a use permit. Stanford Community Plan Policy SCP-LU 3 and 2000 General Use Permit Condition of Approval F.2.c allow high-density housing for faculty and staff at a density of more than 15 units per acre if such housing is compatible with surrounding building densities and designs.

Some of the A1 lands also fall within the County's slope-density overlay district (Section 3.10.040). These districts establish minimum lot sizes based on the average slope for lots and dwelling units permitted through subdivision. The entirety of the Arboretum and Quarry Development Districts as well as areas along El Camino Real in the DAPER and East Campus Development Districts are located in the A1-20s slope density overlay district. Portions of the Foothills Development District are also within the A1-20s district.

The majority of the Lagunita Development District, as well as portions of the Foothills Development District, fall within the County's scenic roads overlay district (Chapter 3.30). The purpose of the scenic roads combining district is to protect the visual character of scenic roads through special development and sign regulations.

Low-Density Campus Residential (R1S)

The purpose of the R1S zoning district is to provide for urban low-density housing (up to 8 units per acre) on the Stanford lands, and to provide for limited neighborhood-supporting non-residential uses. Other allowable uses include the following: institutional, hospital, religious facilities, parks, and schools.

Medium-Density Campus Residential (R3S)

The purpose of the R3S zoning district is to provide for urban medium-density housing on the Stanford lands, and to provide for limited neighborhood-supporting non-residential uses. The R1S district provides for housing between 8 and 15 units per acre. Other allowable uses include the following: institutional, hospital, religious facilities, parks, and schools. The medium-density district located adjacent to Page Mill Road has a scenic roads overlay, see above under the A1 district description.

Open Space and Field Research (OS/F)

The OS/F zoning district was established to maintain the open space character of Stanford lands outside the Academic Growth Boundary. Allowable uses include utilities, low intensity agriculture,

limited agricultural research, field research and studies, limited outdoor recreational activities, recreational trails, environmental restoration, limited ancillary facilities, and Stanford-specialized facilities, such as astronomical or related facilities. As noted in **Section 5.1**, **Visual and Scenic Resources**, any proposed development within the OS/F district requires a comprehensive viewshed analysis and specifies unique County approval processes for new structures within this district (Zoning Ordinance Section 2.50.040). Most of the OS/F district is also subject to a scenic roads overlay.

Architecture and Site Approval (ASA)

ASA is a procedure established by the County of Santa Clara Zoning Ordinance Chapter 5.40 to "maintain the character and integrity of zoning districts by promoting quality development in harmony with the surrounding area, through consideration of all aspects of site configuration and design." ASA is a discretionary permit that the County issues for most new building and certain reconstruction and remodeling projects. In December 2016, ASA functions were consolidated under the County Zoning Administrator. The ASA review process primarily considers site planning, massing, and overall design character issues, not detailed elevations or construction drawings. Stanford General Use Permit conditions must be met on each individual project that is approved under the General Use Permit.

1985 Land Use Policy Agreement

In recognition of Stanford's multi-jurisdictional setting, the County of Santa Clara, the City of Palo Alto, and Stanford entered into a three-party agreement entitled the "1985 Land Use Policy Agreement." The agreement defines what land uses may remain in the unincorporated County and what uses must be annexed to Palo Alto; affords Palo Alto review opportunities for Stanford projects on the unincorporated County lands; and recognizes that Stanford's lands are held in perpetual trust for educational purposes. The agreement calls for maintenance of an informational document known as the Protocol, which outlines adopted land use designations, regulations, restrictions, and review and referral procedures for land use and development on the Stanford campus.

5.10.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on land use and planning if it would:

a) Physically divide an established community;

b) Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or

c) Conflict with any applicable habitat conservation plan or natural community conservation plan.

The Project would have a significant impact on agriculture and forestry resources if it would:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract;

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));

d) Result in the loss of forest land or conversion of forest land to non-forest use; or

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

Approach to Analysis

The examination of land use impacts is based on information obtained from the 2018 General Use Permit application and review of documents pertaining to land use published by the County of Santa Clara, including applicable elements of the Stanford Community Plan and County Zoning Ordinance. The analysis discusses whether the Project would be consistent with applicable land use plans and policies that were adopted for the purpose of avoiding or mitigating an environmental effect. Land use policies are policies that pertain to the type, location, and physical form of new development. For this analysis, policies "adopted for the purpose of avoiding or mitigating an environmental effect" are considered those that, if implemented and adhered to, would avoid or mitigate physical impacts on the environment of development and its related activity. For each potential impact, the analysis compares the impact to the standards of significance listed above and determines the impact's significance.

The issue of the Project's effect on the land use and planning significance criterion (c) (conflict with any applicable habitat conservation plan or natural community conservation plan) is addressed in Section 5.3, Biological Resources, and therefore, not discussed in this section.

Based on the characteristics of the Project and the Project site, the proposed 2018 General Use Permit was determined to have no potential impact on land use and planning criterion (a) or agriculture and forestry resources significance criteria, above:

> **Physically divide an established community –** Academic and academic support and housing development under the 2018 General Use Permit would be constructed on contiguous Stanford land located entirely within the Stanford General Use Permit boundary. Specifically, this development would occur on vacant land, infill sites and redevelopment sites located within the Academic Growth Boundary. The Stanford development districts in which the new Project development would occur are established academic and residential neighborhoods within Stanford's central campus. The Project would not include any permanent physical barriers or obstacles to circulation that would

impede movement across public rights-of-way that cross the Project site, or restrict existing patterns of movement between the Project site and the adjacent neighborhoods. Therefore, the Project would have no impact regarding physically dividing an established community.

Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use – Most of Stanford lands within the Academic Growth Boundary are designated as Urban and Built-Up Land. The remainder of lands within the Academic Growth Boundary, and the great majority of the foothills area outside the Academic Growth Boundary, are designated as Other Land. An exception is the nurseries and equestrian facilities located near the Felt Reservoir along Los Trancos Creek, which are designated as Unique Farmland. No Prime Farmland or Farmland of Statewide Importance is located within the 2018 General Use Permit boundary, and consequently, there would be no potential for conversion of Prime Farmland or Farmland of Statewide Importance as a result of the proposed Project. Furthermore, no changes to the Unique Farmland areas located in the foothills are proposed under the 2018 General Use Permit. Therefore, the Project would have no impact regarding the conversion of Farmland to non-agricultural use

Conflict with existing zoning for agricultural use, or a Williamson Act contract – Within the 2018 General Use Permit boundary there are no lands subject to a Williamson Act contract; therefore, no impact would occur regarding conflicts with such contracts. No land within the Project site is zoned for agricultural use, although land zoned as A1 (General Use) and OS/F (Open Space and Field Research) allow for agricultural uses. Stanford lands that are used for agricultural purposes are mostly located outside the Academic Growth Boundary. Stanford lands within the Academic Growth Boundary are primarily used for urban academic and residential purposes with only limited areas containing agricultural uses. All new academic and academic support or residential development under the 2018 General Use Permit would occur within the Academic Growth Boundary and therefore would not conflict with existing or potential future agricultural uses within the Project site. In addition, future campus infrastructure improvements, some of which would occur outside the Academic Growth Boundary, would also not be expected to result in any long-term conflict with agricultural uses. As a result, there would be no Project impact related to potential conflicts with agricultural uses.

Conflict with existing zoning, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production – Within the 2018 General Use Permit boundary there is no zoning for forest land or timberland, or timberland zoned Timberland Production. Therefore, the Project would have no impact regarding conflict with zoning of forestland, timberland or timberland zoned Timberland Production.

Loss of forest land or conversion of forest land to non-forest use – There is no forest land within the 2018 General Use Permit boundary. Therefore, the Project would have no impact regarding loss or conversion of forest land to non-forest use.

Involve other changes in the existing environment that could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use – As noted above, the Project would not convert Farmland to non-agricultural use. The Unique Farmland that exists on Stanford lands is located outside the Academic Growth Boundary, and is surrounded by land designated as Open Space and Field Research, which under the Project would not be developed with uses that could result in conversion of the Unique Farmland area to non-agricultural use. Furthermore, no forest land exists on the Project site; and therefore, no impact would result regarding conversion to non-forest use.

Impact Evaluation

Impact 5.10-1: The Project could conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant*)

Stanford seeks County approval of the proposed 2018 General Use Permit and related amendments to the Stanford Community Plan and County Zoning Map, collectively known as the Project. Consistency of the Project with the plans, policies and regulations of the Stanford Community Plan and the County Zoning Ordinance is discussed below. The Stanford Community Plan includes multiple policies that address potential environmental effects. For example, the Resource Conservation element includes policies regarding Habitat and Biodiversity; Water Quality and Watershed Management; Heritage Resources; and Scenic Resources. The Health and Safety element includes policies regarding Air Quality; Geological Hazards; Flood Hazards; Hazardous Materials; Emergency Preparedness and Response; Noise; and Law Enforcement. Applicable policies pertaining to these topics are addressed in the relevant environmental resource section of this EIR. The following discussion focuses on the relevant policies contained in the Growth and Development and Land Use elements. Please also see Chapter 4, Plan Consistency, for a discussion of the Project's consistency with plans and policies of County and regional, State, and federal agencies that establish policy direction and regulatory control for the Project.

Stanford Community Plan

As discussed in Chapter 3, Project Description, the proposed 2018 General Use Permit would authorize an additional increment of campus growth and land use development, anticipated to take place over a period that would extend from 2018 through approximately 2035. This includes 2,275,000 net new square feet of net new academic and academic support facilities; 3,150 net new housing units/beds; and other supporting development and facilities. All proposed academic and academic support and residential development under the 2018 General Use Permit would occur within the Academic Growth Boundary, as shown in Figure 3-8. Project-related campus infrastructure improvements may occur within and outside the Academic Growth Boundary. The Academic Growth Boundary is the primary mechanism for promoting compact urban development and resource conservation on the Stanford campus. Growth proposed by the Project would thus be consistent with the Growth and Development policies of the Stanford Community Plan by reducing potential environmental effects that could result from development of Stanford lands outside the Academic Growth Boundary.

No site-specific development projects and specific locations have been identified for development under the Project. Pursuant to the proposed 2018 General Use Permit, at the time individual projects are proposed the County would require Stanford to apply for project-specific approvals; these projects may be subject to additional environmental review prior to consideration of approval by the County. The Project would not apply to uses on Stanford lands that are permitted by right under the County Zoning Ordinance. Project development that is proposed within each Stanford development district is described below.

Campus Center Development District

Nearly 80 percent of the anticipated academic and academic support space proposed under the 2018 General Use Permit would occur in the Campus Center Development District. Proposed development in the Campus Center Development District would include 1,800,000 net new square feet of academic and academic support space and 200 housing units/beds. In the Stanford Community Plan nearly the entire Campus Center district is designated as Academic Campus, which allows for the development of academic and academic support space and student housing. Stanford Community Plan Policy SCP-LU 3 allows high-density housing for faculty and staff at a density of more than 15 units per acre if such housing is compatible with surrounding building densities and designs. The Oval and areas along Palm Drive within the Campus Center Development District are designated as Campus Open Space in the Stanford Community Plan. No new permanent, above-ground buildings or structures for occupancy are permitted within this area. Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project.

As indicated above, although no site-specific development plans have been submitted, proposed academic and academic support development proposed as part of the Project would be consistent with the Academic Campus land use designation. Proposed housing development also would be consistent with the Academic Campus land use designation provided any potential faculty and staff housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

East Campus Development District

Fifty percent of new housing units (1,600 units/beds) proposed under the 2018 General Use Permit, along with 20,000 square feet of academic and academic support space, would be located in the East Campus Development District. This entire district is designated as Academic Campus by the Stanford Community Plan, with the exception of a strip of land along Stanford Avenue that is designated as Campus Residential-Low Density. Proposed academic and academic support uses and housing development would be consistent with the Academic Campus land use designation, provided any potential faculty and staff housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

Quarry Development District

Under the 2018 General Use Permit, the Quarry Development District would include up to 550 high-density housing units and 200,000 square feet of academic and academic support space. The entire Quarry Development District is designated as Academic Campus by the Stanford Community Plan. Proposed academic and academic support uses and housing development would be consistent with the Academic Campus land use designation provided any potential faculty and staff housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

DAPER and Administrative Development District

A total of 200,000 square feet of academic and academic support space are proposed in the DAPER and Administrative Development District under the 2018 General Use Permit. No housing units are anticipated in this district under the Project. The DAPER and Administrative

Development District is designated as Academic Campus in the Stanford Community Plan except for an area between Stanford Stadium and El Camino Real that is designated as Campus Open Space. As noted above under Campus Center Development District, Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project. Proposed academic and academic support development would be consistent with the Academic Campus land use designation in this district.

Lagunita Development District

The Lagunita Development District is proposed to include up to 800 housing units and 20,000 square feet of academic and academic support space under the 2018 General Use Permit. The Lagunita Development District is designated as Academic Campus in the Stanford Community Plan, except for an area around the Lagunita itself and a strip of land that extends west along Junipero Serra Boulevard to Campus Drive, which is designated as Campus Open Space. Proposed academic and academic support uses and housing development would be consistent with the Academic Campus land use designation provided any potential faculty and staff housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3. Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project.

West Campus Development District

Under the 2018 General Use Permit, proposed development in the West Campus Development District would include up to 35,000 square feet of academic and academic support space. The West Campus district is designated as Academic Campus in Stanford Community Plan except for the Palo Alto Stock Farm Stable area ("Red Barn") and a narrow strip of Campus Open Space along Campus Drive near its intersection with Junipero Serra Boulevard. Stanford would not construct new buildings within the Campus Open Space designated lands as part of the Project. Proposed academic and academic support development would be consistent with the Academic Campus land use designation in this development district.

Lathrop Development District

Proposed development in the Lathrop Development District under the 2018 General Use Permit includes up to 20,000 square feet of academic and academic support space. The entire Lathrop Development District is designated as Academic Campus in the Stanford Community Plan. Proposed academic and academic support development would be consistent with the Academic Campus land use designation.

Arboretum, San Juan, and Foothills Development Districts

As noted above under Impact 5.10-1, under the 2018 General Use Permit, Stanford proposes no new building square footage or housing in the Arboretum, San Juan, or Foothills Development Districts. However, various infrastructure improvements could be constructed in these development districts as well as throughout the lands subject to the proposed 2018 General Use Permit.

Development District Boundary Changes

As described in the Project Description, as part of the Project, Stanford also proposes two minor modifications to the Campus Center and San Juan Development District boundaries (see **Figure 3-9** in Chapter 3), including:

- a boundary modification to include the existing Knight Management Center in the Campus Center Development District, rather than in the DAPER and Administrative Development District in which it currently is located; and
- modification of the San Juan Development District boundary so that it is coterminous with the County's Low-Density Campus Residential (R1S) zoning district boundary for this area (as modified by the proposed zoning change that is part of the Project).

Compared to existing conditions, these development district boundary modifications would better align existing zoning boundaries with uses and conditions on the ground. These changes would be consistent with existing land uses, as well as proposed additional development in these areas under the Project.

Stanford Community Plan Amendments

As indicated in the Project Description, the proposed Project would not include modifications to any strategies, policies, or implementation measures in the Stanford Community Plan. As reflected in **Figure 3-11** in Chapter 3, Stanford proposes two amendments to the Community Plan land use map, including:

- designation of the Driving Range Site in the Lagunita Development District from Campus Residential – Medium Density to Academic Campus, reflecting that Stanford no longer plans to construct housing at this location; and
- designation of nine faculty houses in the San Juan Development District from Academic Campus to Campus Residential – Low Density to better reflect both the existing and – future use of these houses.

The purpose of these proposed amendments to the Stanford Community Plan is to better reflect existing conditions on the ground and future use of these sites. Therefore, these amendments would be consistent with existing land uses and proposed additional development under the Project.

Zoning Map Amendments

As indicated in the Project Description, under the Project Stanford does not seek to change any County Zoning Code text. As reflected in **Figure 3-12** in Chapter 3, Stanford proposes two amendments to the County Zoning Map that would:

- rezone the Driving Range Site from R3S (Medium-Density Campus Residential) to A1 (General Use); and
- rezone nine faculty houses from A1 to R1S (Low-Density Campus Housing).

These proposed zoning amendments would correlate with proposed amendments to the Stanford Community Plan, described above, to better reflect existing conditions on the ground and future use of these sites. Consequently, these amendments would be consistent with existing land uses and proposed additional development in these areas under the Project.

Summary

Upon adoption by the Santa Clara County Board of Supervisors, the proposed 2018 General Use Permit would replace the 2000 General Use Permit. Conditions of approval in the 2000 General Use Permit regarding the type and location of allowable development on Stanford lands would be updated to reflect development proposed by the 2018 General Use Permit. These conditions include the allowable new space for academic and academic support uses, the number of new housing units, and other supporting development and facilities. The distribution of new space within the development districts also would be revised to align with the distribution shown in Table 3-5, *2018 General Use Permit Proposed Development Distribution by Development District* in Chapter 3. Finally, the existing Development Districts map would be revised with the boundary modifications shown in Figure 3-9 in Chapter 3.

The proposed land uses described in the 2018 General Use Permit application would be consistent with the existing land use designations for Stanford lands described in the Stanford Community Plan. Adoption of the changes regarding proposed new development as well as approval of amendments to the Stanford Community Plan land use map and County Zoning Ordinance map would ensure that implementation of the proposed Project would have a less-than-significant impact regarding consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation: None required.

Cumulative Impacts

The proposed 2018 General Use Permit was determined to have no potential impact on land use and planning criterion (a), or agriculture and forestry resources significance criteria (a) through (e). Because a cumulative impact is only relevant when considered in the context of an adverse effect of the Project, there is no basis for consideration of cumulative effects related to those impacts. Thus, the cumulative discussion below focuses on cumulative effects related to Impact 5.10-1, above.

Impact 5.10-2: The Project, in combination with past, present, and future projects could potentially contribute to cumulative land use impacts. (*Less than Significant*)

The geographic scope of potential cumulative land use impacts encompasses the Stanford lands within the 2018 General Use Permit boundary, Stanford lands adjacent to the boundary and not under County of Santa Clara jurisdiction, and adjacent, non-Stanford lands in other jurisdictions.

Areas bordering the Project site include other Stanford lands and non-Stanford lands under the jurisdiction of Palo Alto, Menlo Park, Portola Valley, Los Alto Hills, and San Mateo County. Areas under the jurisdiction of Menlo Park, Portola Valley, Los Alto Hills, and San Mateo County (as well as certain portions of Palo Alto) that border the Project site are adjacent to that portion of the Project located outside the Academic Growth Boundary (i.e., the foothills) where no academic and academic support space, or housing development is proposed under the 2018 General Use Permit. The Project would not result in conflicts with land use plans and policies of these jurisdictions. No cumulative land use impacts would result from the Project combining with impacts of past, present, or reasonably foreseeable future projects in these jurisdictions.

Lands that border that portion of the Project within the Academic Growth Boundary include Stanford lands within Palo Alto, such as the Research Park, Stanford University Medical Center, and Stanford Shopping Center, as well as non-Stanford lands within Palo Alto along El Camino Real and the College Terrace residential neighborhood. These areas are generally developed urban areas. Reasonably foreseeable growth within Palo Alto in areas adjacent to the Project site would represent intensification of existing land uses. Less than significant cumulative land use impacts would result from the Project combining with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto that border the Academic Growth Boundary.

Mitigation: None required.

5.10.6 References

County of Santa Clara; *Stanford Community Plan*, adopted December 2000.

County of Santa Clara, Planning Office; *Stanford University General Use Permit*, adopted December 2000, revised November 26, 2013, and May 5, 2015.

County of Santa Clara; *Zoning Code*, as amended.

County of Santa Clara, City of Palo Alto and Stanford University; *1985 Land Use Policy Agreement*, approved 1985.

Department of Conservation (DOC); *Santa Clara County Important Farmland 2014 Map*, published October 2016.

DOC; *Santa Clara County Williamson Act FY 2015/2016 Map*, published 2016.

DOC; *San Mateo County Important Farmland 2014 Map*, published February 2016.

DOC; *Farmland Mapping and Monitoring Program*, www.conservation.ca/gov/dlrp/fmmp, 2017.

Stanford University; *2018 General Use Permit Application*, submitted to the County of Santa Clara November 21, 2016, as amended.

Stanford University; *Stanford University Special Conservation Area Plan*, August 5, 2015.

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5.11 Noise and Vibration

5.11.1 Introduction

This section addresses the potential for implementation of the proposed 2018 General Use Permit to result in noise and vibration impacts. The section presents an overview of noise conditions under the existing and 2018 environmental settings, and a discussion of applicable federal, State, and County regulations. The section analyzes potential impacts on the ambient noise environment caused by construction and operation of development under the Project, and identifies regulatory mechanisms and/or potentially feasible mitigation measures that could ensure potentially significant impacts from noise and vibration would be reduced. The analysis focuses on impacts on humans and structures; potential effects on wildlife are addressed in Section 5.3, Biological Resources.

5.11.2 Existing Environmental Setting

Technical Background

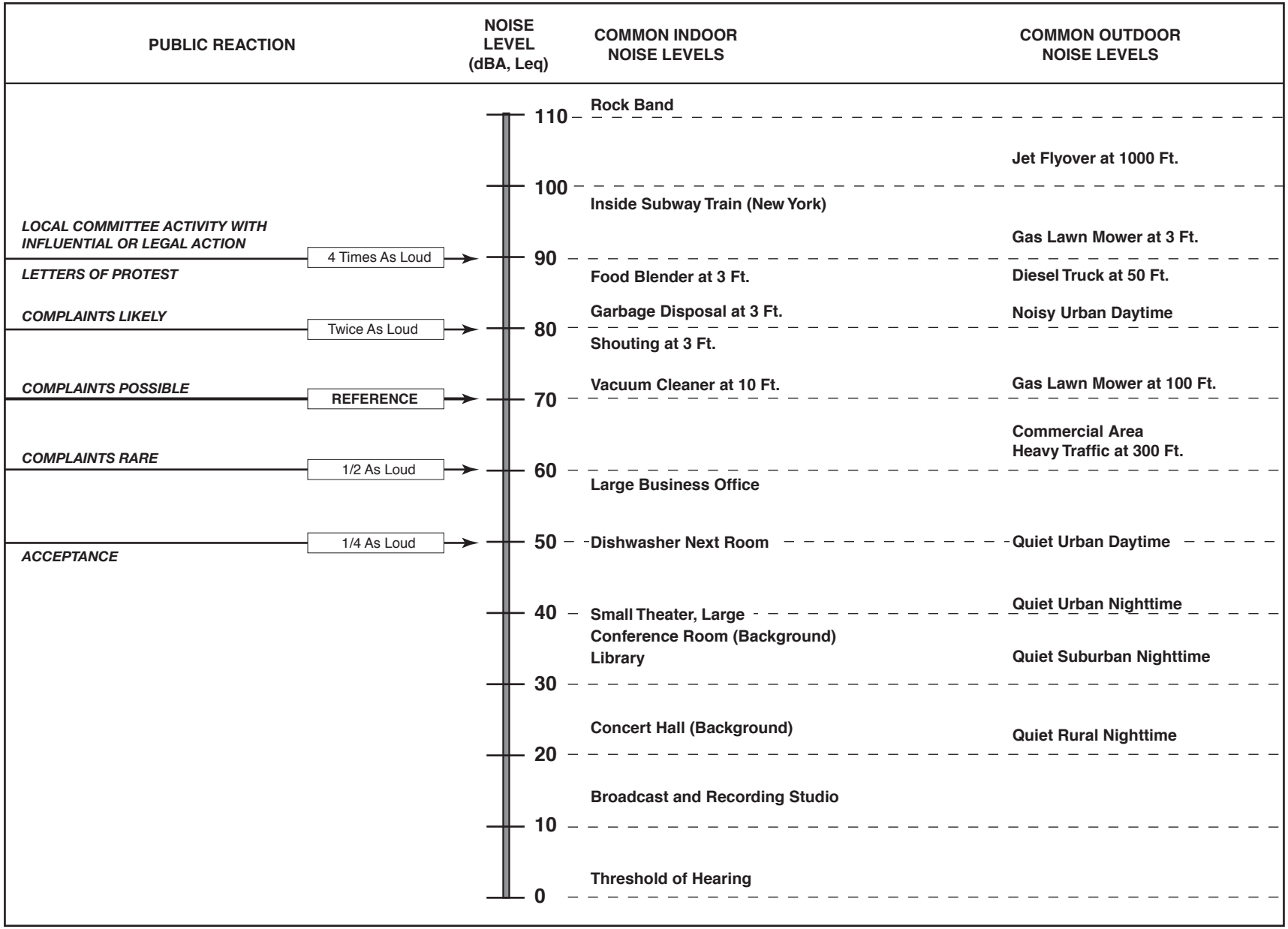
Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the "loudness" of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of decibels (dBA).[1] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Noise Exposure and Community Noise

Noise exposure for any individual is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in **Figure 5.11-1** represent noise measured at a given instant in time; however, noise levels rarely persist consistently over a long period of time. Rather, community noise varies continuously over time because of the contributing sound sources of the community noise

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and modification by ESA

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Figure 5.11-1
Effects of Noise on People

environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and wind. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to accurately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below.

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time.

L_{50}: The noise level that is equaled or exceeded 50 percent of the specified time. This is the median noise level during the specified time.

L_{90}: The noise level that is equaled or exceeded 90 percent of the specified time. The L_{90} is often considered the background noise level averaged over the specified time.

DNL: The Day/Night Average Sound Level is the 24-hour day and night A-weighed noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance from nighttime noise. (Also referred to as "Ldn.")

CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

SEL: Sound Exposure Level is the cumulative noise exposure from a single noise event, normalized to a one second event. Consequently, both the magnitude of the event as well as the duration of the event contribute to the calculation of the SEL. The SEL is the constant noise level that would deliver the same acoustic energy to the ear of a listener during a one-second exposure as the actual time-varying noise would deliver over its entire time of occurrence.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories (see Figure 5.11-1). Workers in or near industrial plants may experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships are known to exist:

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside these controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear can barely perceive changes in the noise level of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10 dBA change is recognized as twice as loud as the original source (Caltrans, 2013).

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (i.e., atmospheric conditions and noise barriers, vegetative or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA each time the distance doubles from the source, which also depends on environmental conditions (Caltrans, 2013). Noise from large construction sites would exhibit characteristics of both "point" and "line" sources, and attenuation will therefore generally range between 4.5 and 7.5 dBA each time the distance doubles.

Existing Noise Sources and Levels

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in the urban environment. Along major transportation corridors, noise levels can reach 80 DNL, while along arterial streets, noise levels typically range from 65 to 70 DNL. However,

noise levels on roadways, like all areas, can be affected by intervening development, topography, or landscaping. Industrial and commercial equipment and operations also contribute to the ambient noise environment in their vicinities.

Primary noise sources in the immediate vicinity of the Project site include traffic on the network of local streets, including Junipero Serra Boulevard/Foothill Expressway, El Camino Real, Sand Hill Road, Page Mill Road, Embarcadero Road and University Avenue. In addition to local roads, Stanford Avenue, and internal campus roadways (e.g., Campus Drive and Palm Drive) also contribute to noise in the Project site vicinity. Interstate 280 (I-280), Alpine Road, Arastradero Road and Junipero Serra Boulevard extend through, and/or adjacent to, the largely undeveloped Foothills area, and consequently, contribute noise in that portion of the Project site as well. In addition, as explained below, the Stanford University Medical Center (SUMC) operates a helipad near the Project site which generates helicopter noise (approximately six helicopter trips daily).

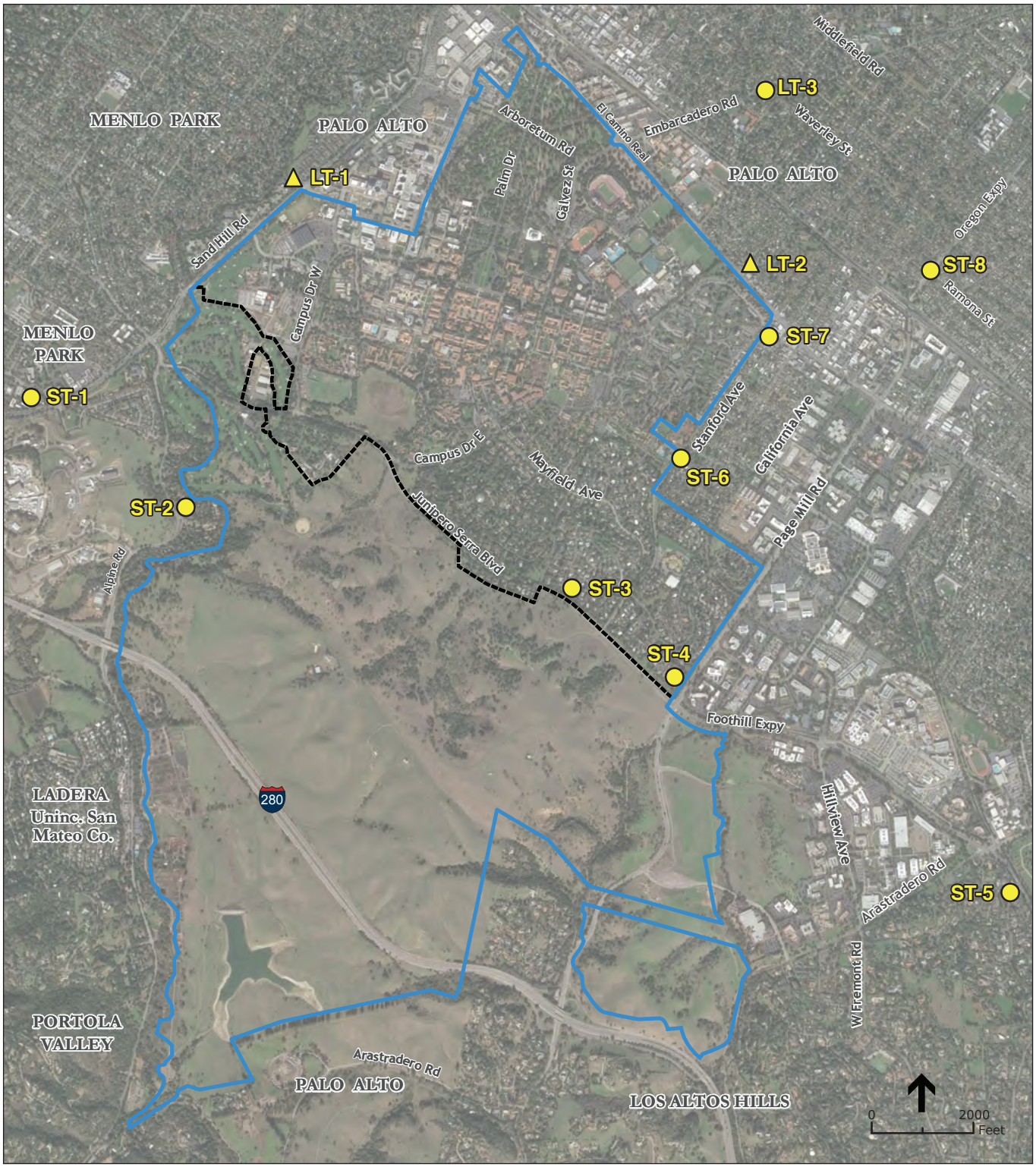
Stationary or industrial noise sources located within the Project site include the Central Energy Facility (CEF). Most operational noise sources of the CEF are enclosed within the building that attenuates noise from these sources (e.g., heat recovery systems) within the building. However exterior blowers on the south side of the facility generate noise levels of up to 64 dBA at the property line of the facility, which is over 800 feet away from the nearest noise-sensitive receptor, and further away from instructional classrooms or commercial service land use. Additionally, events at Stanford Stadium or other athletic venues on campus can generate noise during events from crowds, bands, public address system, generators, and horn blasts during scoring events.

To characterize the noise environment in and around the Project site, both long-and short-term noise monitoring was conducted. Long-term noise monitoring was conducted at three off-site locations, while short-term monitoring of daytime conditions was conducted at eight on- and off-site locations. **Figure 5.11-2** shows the noise monitoring locations. The noise measurement locations were selected based on proximity of residential areas to arterial roadways commonly used to access the Project site. **Table 5.11-1** presents a summary of the noise monitoring results.

The SUMC operates a “Lifeflight” critical care transport program that uses a helicopter to transport patients. The helipad is located on the rooftop of the Stanford University Hospital (SUH), approximately 400 feet west of Quarry Road. Noise contours developed for helicopter operations at the SUH indicate that the 60 dBA, DNL noise contour does not extend into the Project site (City of Palo Alto, 2010).

Vibration Background

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe physical vibration impacts on buildings. Typical groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include people (especially residents, the elderly, and sick people), structures (especially older masonry structures), and vibration-sensitive equipment.



ST-# Short-Term Monitoring Location

LT-# Long-Term Monitoring Location

Stanford 2018 General Use Permit Boundary

Academic Growth Boundary

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SOURCE: Google Earth; ESA

Figure 5.11-2
Noise Monitoring Locations

TABLE 5.11-1
MONITORED NOISE ENVIRONMENTS

Long Term Measurement Location	Day-Night Noise level (DNL)	Noise Levels in dBA	
		Daytime hourly average Leq	Nighttime hourly average Leq
LT-1. 1600 Sand Hill Road, Oak Creek Apartments	66	64	59
LT-2. 1671 El Camino Real, Southgate Neighborhood	72	71	63
LT-3. 1431 Waverley Street at Embarcadero Road	64	62	55

Short Term Measurement Location	Time	Noise Levels in dBA	
		L_{eq}	L_{max}
ST-1: 675 Sharon Park Drive; Sharon Park Apartments	2:53 to 3:13 p.m.	54.9	62.6
ST-2: 3 Sneckner Court; Single Family Residences adjacent to Alpine Road	2:11 to 2:26 p.m.	58.1	67.9
ST-3: 950 Lathrop Place; Single Family Residences adjacent to Junipero Serra Boulevard	10:17 to 10:32 a.m.	56.4	67.3
ST-4: 1076 Vernier Place; Single Family Residences adjacent to Junipero Serra Boulevard and Page Mill Road	9:54 to 10:09 a.m.	49.8	60.1
ST-5: 4192 Manuela Avenue; Single Family Residences adjacent to Foothill Expressway	9:22 to 9:37 a.m.	55.2	77.1
ST-6: 1575 Stanford Avenue; Single Family Residences and Child Care Facility	10:53 to 11:08 a.m.	59.5	77.4
ST-7: 591 Stanford Avenue; Single Family Residences	11:16 to 11:40 a.m.	61.3	77.6
ST-8: 2389 Ramona Street; Single Family Residences adjacent to Oregon Expressway	3:50 to 4:05 p.m.	61.7	75.9

NOTE: See Figure 5.11-2 for noise measurement locations. Daytime hours are considered to be 7:00 a.m. to 10:00 p.m. for noise metrics.

SOURCE: Environmental Science Associates, 2017.

Another useful vibration descriptor is known as vibration decibels or VdBs. VdBs are generally used when evaluating human response to vibration, as opposed to structural damage (for which PPV is the more commonly used descriptor). Vibration decibels are established relative to a reference quantity, typically 1 x 10^{-6} inches per second.[2]

There are no major sources of vibration in the Project site vicinity. Most motor vehicles and trucks have independent suspension systems that substantially reduce if not eliminate vibration generation, barring discontinuities in the roadway.

[2] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, 2006.

Sensitive Receptors and Land Uses

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

Residential receptors near the Project site include, but are not limited to, the Southgate neighborhood, located north of the Project site across El Camino Real; and the College Terrace neighborhood located east of the Project site across Stanford Avenue. As mentioned above, the SUMC is located just west of the Project site. Several primary and secondary schools are located within one-quarter mile of the boundary of the Project site, including Oak Knoll Elementary School (1895 Oak Knoll Lane), Sand Hill Special Education School (650 Clark Way), AltSchool Emerson (930 Emerson Street), Lucille M. Nixon Elementary School (1711 Stanford Ave), Escondido Elementary School (890 Escondido Road), Castilleja School (1310 Bryant Street), Living Wisdom School (456 College Avenue), and Palo Alto High School (50 Embarcadero Road). See also **Figure 5.2-1** in Section 5.2, Air Quality, for an illustrative map of sensitive land uses in the Project vicinity.

Other sensitive receptors are located along roadways used to access the Project site:

- Sand Hill Road is a major four-lane arterial roadway that extends along a portion of the northwestern boundary of the Project site and is a direct access route to and from I-280. Sensitive receptors along this roadway are represented by monitoring location LT-1, located at the Oak Creek Apartment complex, and by ST-1 located at the Sharon Park Apartment complex in Menlo Park. Noise at these monitoring locations is dominated by vehicle travel on Sand Hill Road.
- El Camino Real is a major six-lane arterial state highway on the northeastern boundary of the Project area. Sensitive receptors along this roadway are represented by monitoring location LT-2 located in the Southgate neighborhood. Noise at this location is dominated by vehicle travel on El Camino Real. Operations of the Caltrain commuter rail also contribute intermittently to noise levels in the neighborhood.
- Junipero Serra Boulevard is a two-lane arterial roadway the crosses the Project site from the northwest to the southeast. Sensitive receptors along this roadway are represented by monitoring locations ST-3 and ST-4. Noise at these locations is dominated by vehicle travel on Junipero Serra Boulevard.
- Foothill Expressway is a major four-lane arterial roadway that extends southeast from the Project site east of Page Mill Road. Sensitive receptors along this roadway are represented by monitoring location ST-5 which is located in the Esther Clark Park neighborhood in Palo Alto. Noise at this location is dominated by vehicle travel on Foothill Expressway.
- Alpine Road is a two lane arterial that extends along a portion of the Project site western boundary, and is an alternative direct access route to and from I-280. Sensitive receptors along this roadway are represented by monitoring location ST-2, which is located in the Stanford Weekend Acres neighborhood in unincorporated San Mateo County.

- Page Mill Road/Oregon Expressway is a major four-lane arterial roadway that extends along a portion of the southeastern boundary of the Project site and is a direct access route to and from U.S. Highway 101 (U.S. 101) and I-280. Sensitive receptors along this roadway are represented by monitoring location ST-8 which is located in the Old Palo Alto neighborhood.
- Embarcadero Road is a two lane arterial roadway that extends northeast from the Project site and is a direct access route to and from U.S. 101. Sensitive receptors along this roadway are represented by monitoring location LT-3 which is located in the Old Palo Alto neighborhood.
- Stanford Avenue is a two lane connector roadway that extends along a portion of the southeastern boundary of the Project site. Sensitive receptors along this roadway are represented by monitoring locations ST-6 and ST-7.

Within the project site, residential uses inclusive of student housing and instructional classroom areas would also be considered noise sensitive to potential construction-related impacts of the proposed Project. Because the sensitivity of receptors varies with land use, the County establishes its noise exposure standards in terms of land use (see Section 5.11-4)

5.11.3 2018 Environmental Baseline

As discussed in Chapter 5, Approach to Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time approval of the proposed 2018 General Use Permit is considered. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020. Since the EV Graduate Residences will not be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline. Construction noise from EV project would be completed by 2020.

There would be incremental increases in traffic on study area roadways associated with increases in near-term cumulative development between the existing and 2018 baseline settings, which would result in correlating minor increases in roadside noise levels. These noise increases are presented in Section 5.11.5. Otherwise, there are no other notable changes related to noise and vibration anticipated to occur between the existing environmental setting described above and the 2018 baseline condition.

5.11.4 Regulatory Setting

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Within the Project site, Stanford is subject to the noise and vibration policies and standards of the Santa Clara County General Plan, including the Stanford Community Plan, and the County of Santa Clara Ordinance Code. However, given the location of nearby sensitive land uses in the adjacent jurisdictions of Palo Alto and Menlo Park, the noise ordinances of those cities are also discussed. Although the City of Menlo Park has a noise ordinance, its standards are not as stringent as those of the City of Palo Alto, and thus are not presented below. In addition, Title 24 standards of the California Code of Regulation that the County enforces are also addressed, below.

State

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in Title 24 of the California Code of Regulations (CCR).

The State of California updated its Building Code requirements with respect to sound transmission, effective January 2014. Section 1207 of the California Building Code (CCR, Title 24) establishes material requirements in terms of sound transmission class (STC)[3] rating of 50 for all common interior walls and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public area. The previous code requirements (before 2014) set an interior performance standard of 45 dBA from exterior noise sources. This requirement was reinstated in July of 2015. Title 24 standards are enforced through Santa Clara County's building permit application and inspection process.

County of Santa Clara

The County of Santa Clara regulates noise through implementation of its Ordinance Code and through implementation of its General Plan Safety and Noise Chapter, and Health Element. The Safety and Noise Chapter of the County of Santa Clara's General Plan establishes exterior noise compatibility standards for various land uses as well as recommended maximum interior noise levels for intermittent use. These standards are used to assess the appropriateness of siting and design of new land uses within the County.

[3] The STC is used as a measure of a materials ability to reduce sound. The STC is equal to the number of decibels a sound is reduced as it passes through a material.

Santa Clara County General Plan

Safety and Noise Chapter

The Santa Clara County General Plan Safety and Noise Chapter contains the following strategies, policies and implementation actions with regard to noise (noise exposure standards within the Element are presented in **Figure 5.11-3** and **Table 5.11-2**):

Strategy #1: Prevent or Minimize Noise Conflicts.

Policy C-HS 24 – Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility.

Policy C-HS 25 – Noise impacts from public and private projects should be mitigated.

Implementation Recommendations:

C-HS(i) 23 – Project design review should assess noise impacts on surrounding land uses.

C-HS(i) 24 – Where necessary, construct sound walls or other noise mitigations.

C-HS(i) 25 – Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.

C-HS(i) 26 – Require project-specific noise studies to assess actual and protected dB noise contours for proposed land uses likely to generate significant noise.

C-HS(i) 27 – Take noise compatibility impacts into account in developing local land use plans.

Strategy #2: Provide Adequate Sound Buffers.

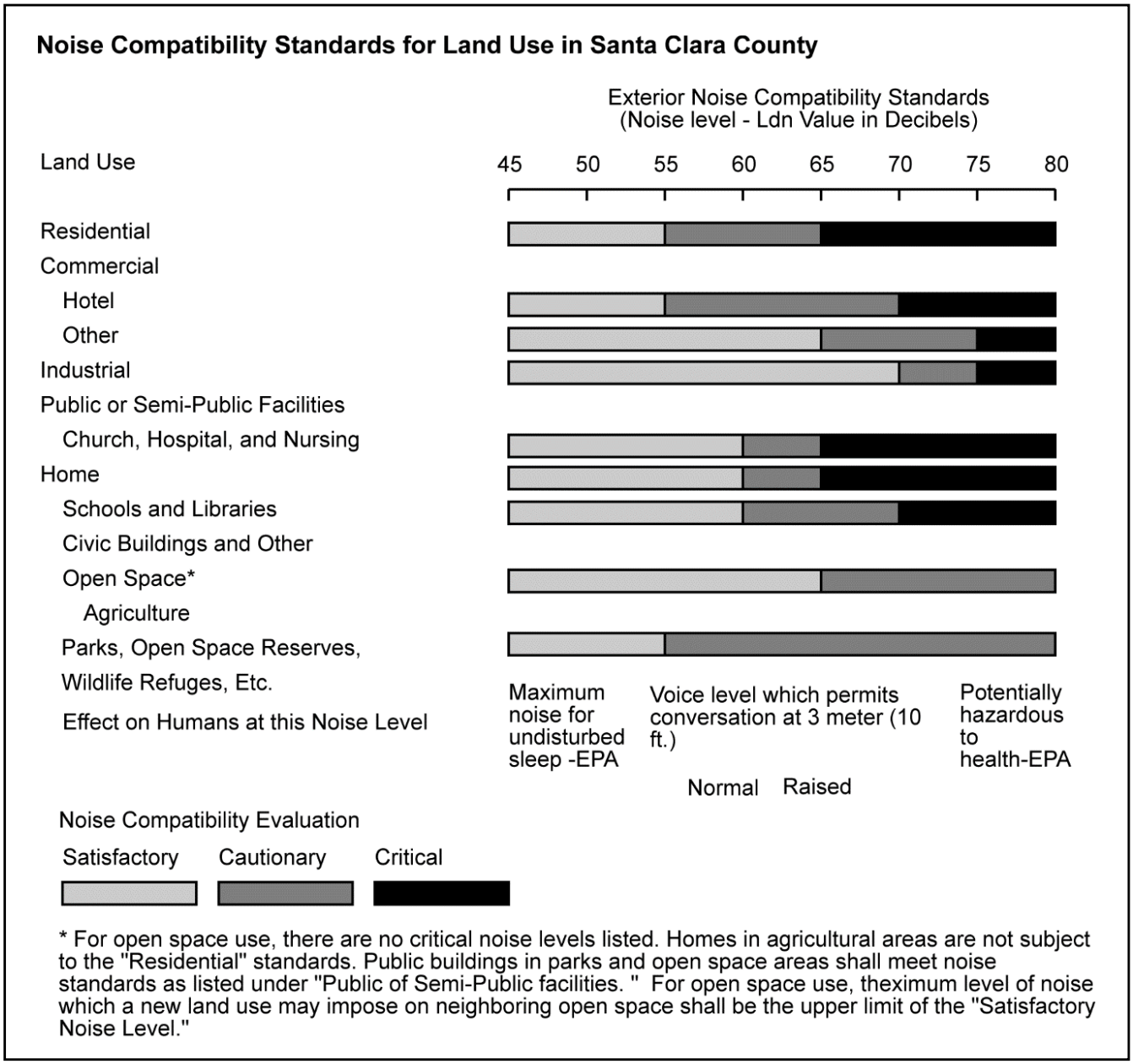
Policy C-HS 26 – New development in areas of noise impact (areas subject to sound levels of 55 DNL or greater) should be approved, denied, or conditioned so as to achieve a satisfactory noise level for those who will use or occupy the facility (as defined in "Noise Compatibility Standards for Land Use" *[see Figure 5.11-3]* and "Maximum Interior Noise Levels For Intermittent Noise" *[see Table 5.11-2]*).

Implementation Recommendations:

C-HS(i) 28 – Incorporate acoustic site planning into the design of new development, particularly large scale, mixed use, or master planned development, through measures which may include: a. separation of noise sensitive buildings from noise generating sources; b. use of natural topography and intervening structure to shield noise sensitive land uses; and c. adequate sound proofing within the receiving structure.

Strategy #3: Minimize Exposure to Airport Noise.

Policy C-HS 27 – Land uses approved by the County and the cities shall be consistent with the adopted policies of the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plans for specific airports.



SOURCE: Santa Clara County General Plan

Figure 5.11-3
Noise Compatibility Standards for Land Use in Santa Clara County

TABLE 5.11-2
RECOMMENDED MAXIMUM INTERIOR NOISE LEVELS FOR INTERMITTENT NOISE

Land Use Category	Land Use Type	Maximum Interior Noise Level (dBA)
Residential	Single Family Residential	45
	Multi-Family Residential	45
Commercial	Hotel-Motel	45
	Executive Offices, Conference Rooms	55
	Staff Offices	60
	Restaurant, Market, Retail Stores	60
	Sales, Secretarial	65
	Sports Arena, Bowling Alley, etc.	75
Industrial	Offices (same as above)	55-60
	Laboratory	60
	Machine Shop, Assembly and others	75
	Mineral Extraction	75
Public or Semi-Public Facility	Concert Hall and Legitimate Theater	30
	Auditorium, Movie Theater, and Church	45
	Hospital, Nursing Home And Firehouse (Sleeping Quarters)	45
	School Classroom	50
	Library	50
	Other Public Buildings	55

SOURCE: Santa Clara County General Plan, 1994

Implementation Recommendations:

> ***C-HS(i) 29 –*** Adhere to the adopted policies and standards in the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plans for specific airports, when making decisions regarding land use adjacent to airports.

Health Element

August 25, 2015, the County adopted a new Health Element of the Santa Clara County General Plan. The Health Element Section G, Air Quality and Climate Change, contains the following strategy and policies with regard to noise:

> ***Policy HE-G.9*** – *Healthy infill development.* Promote measures and mitigations for infill development to protect residents from air and noise pollution, such as more stringent building performance standards, proper siting criteria, development and environmental review processes, and enhanced air filtration.

Stanford Community Plan

The Stanford Community Plan is an element of the County's General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

The Stanford Community Plan includes a Health and Safety chapter that contains the following strategies, policies and implementation actions with regard to noise.

Health and Safety

Noise

Strategy #8: Prevent or Minimize Excessive Noise.

Policy SCP-HS 21 – Identify potential noise-producing uses and determine needs for mitigation using applicable County, local, and other government standards when evaluating proposals for new Stanford facilities.

Policy SCP-HS 22 – Locate new land uses and development projects to conform with County noise compatibility standards for land uses.

Policy SCP-HS 23 – Minimize noise from construction equipment and other operational sources, through engineering solutions, hours of operation, delivery schedules, and the location of specific noise sources as far away from sensitive receptors as possible.

Implementation Recommendations:

SCP-HS (i)15 – Provide noise buffers as needed and control excessive noise sources from future facilities.

SCP-HS (i)16 – Ensure compliance with the County noise ordinance and other applicable standards.

SCP-HS (i)17 – Require that Stanford design and construct new buildings with soundproofing materials as necessary and appropriate.

SCP-HS (i)18 – Require that Stanford maintain a hotline that members of the public can contact to register noise complaints.

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan

The Santa Clara County Airport Land Use Commission (ALUC) was established to provide for appropriate development of areas surrounding public airports in Santa Clara County. It is intended to minimize the public's exposure to excessive noise and safety hazards.

Airports and Airfields

The Palo Alto Airport is a general aviation airport located approximately 2.5 miles northeast of the Project site, and the Moffett Federal Airfield is located approximately 5.4 miles east of the Project site. The ALUC adopted its Comprehensive Land Use Plan (CLUP) for the Palo Alto Airport in 2008, and for the Moffett Federal Airfield in 2012. The CLUPs indicate the Project site is not located within the Airport Influence Area of either of these facilities (SCCALUC, 2008; SCCALUC, 2012).

Heliports

In October of 2015, the ALUC adopted its Heliport Land Use Compatibility Plan (HLUCP) for heliports within the County. While the HLUCP contains noise compatibility policies, it exempts from those policies heliports associated with hospitals, including the SUH heliport located in the SUMC near the Project site.

Santa Clara County Ordinance Code

The County noise ordinance, Title B, Division B11, Chapter VIII of the Santa Clara County Ordinance Code, was established to control unnecessary, excessive and annoying noise and vibration, and to maintain quiet in those areas that exhibit low noise levels and to implement programs aimed at reducing noise in those areas where noise levels are above acceptable values. The ordinance generally prohibits any sound that endangers or injures the safety or health of human beings or animals, annoys or disturbs a person of normal sensitivities, or endangers or injures personal or real properties. The ordinance gives the County Director of Environmental Health discretion to grant variances from the County's noise standards if the Director determines that the activity will not create a nuisance and will not be detrimental to the public health and safety. The Director may impose conditions that are reasonable and necessary to protect public health, safety and welfare from adverse noise effects.

Exterior Noise Standards

The Santa Clara County noise ordinance establishes exterior noise levels not to be exceeded on another property for more than 30 minutes in a given hour. These standards are presented in **Table 5.11-3**. If the noise measurement occurs on a property adjoining a different land use category, the noise level limit applicable to the lower land use category, plus five dB applies. In the event the alleged offensive noise contains a steady, audible tone such as a whine, screech or hum, or contains music or speech conveying informational content, the standard limits are to be reduced by five dB.

TABLE 5.11-3
SANTA CLARA COUNTY NOISE ORDINANCE EXTERIOR NOISE LIMITS

Receiving Land Use Category	Time Period	Maximum Exterior Noise Level (dBA, L_{50})
One- and Two-Family Residential	10:00 p.m.—7:00 a.m. 7:00 a.m.—10:00 p.m.	45 55
Multiple-Family Dwelling	10:00 p.m.—7:00 a.m.	50
Residential Public Space	7:00 a.m.—10:00 p.m.	55
Commercial	10:00 p.m.—7:00 a.m.	60
	7:00 a.m.—10:00 p.m.	65
Light Industrial	Any Time	70
Heavy Industrial	Any Time	75

SOURCE: Santa Clara County Code Chapter VIII, Section B11-152

Interior Noise Standards

For multi-family residential units the County noise ordinance establishes interior noise level standards. Between the hours of 10:00 p.m. and 7:00 a.m. a maximum interior noise levels standard of 35 dBA applies, while between the hours of 7:00 a.m. and 10:00 p.m. a maximum interior noise levels standard of 45 dBA applies.

Construction Noise Standards

The County noise ordinance contains separate standards for addressing noise from construction and demolition. First, the noise ordinance establishes allowable hours of construction. Specifically, operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, that creates a noise disturbance across a residential or commercial real property line is prohibited, except for emergency work of public service utilities or by variance.

Secondly, the County noise ordinance requires construction activities to be conducted, where technically and economically feasible, in a manner that noise levels at affected properties not exceed certain levels. The ordinance establishes noise level standards for affected properties for both mobile and stationary equipment. These standards are presented in **Table 5.11-4**. The County noise ordinance also contains an exemption for the emission of sound in the performance of emergency work.

TABLE 5.11-4
SANTA CLARA COUNTY NOISE ORDINANCE STANDARDS FOR CONSTRUCTION EQUIPMENT

	Single- and Two-Family Dwelling Residential Area (dBA)	Multifamily Dwelling Residential Area (dBA)	Commercial Area (dBA)
Mobile Equipment			
Daily, except Sundays and legal holidays 7:00 a.m.-7:00 p.m.	75	80	85
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50	55	60
Stationary Equipment			
Daily, except Sundays and legal holidays 7:00 a.m.-7:00 p.m.	60	65	70
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50	55	60

SOURCE: Santa Clara County Code Chapter VIII, Section B11-154(b)(6)

Vibration

The noise ordinance prohibits operating or permitting the operation of any device that creates a vibrating or quivering effect that endangers or injures the safety or health of human beings or animals; annoys or disturbs a person of normal sensitivities or endangers or injures personal or real properties. Quantitative vibration standards are not established in the County Ordinance Code.

City of Palo Alto

City of Palo Alto Comprehensive Plan

The City of Palo Alto Comprehensive Plan includes a Natural Environment Element that contains the following policies in relation to noise:

Policy N-39 – Encourage the location of land uses in areas with compatible noise environments. Use the guidelines in the table "Land Use Compatibility for Community Noise Environment" to determine compatibility.

- The guideline for maximum outdoor noise levels in residential areas is an Ldn of 60 dB. This level is a guideline for the design and location of future development and a goal for the reduction of noise in existing development. However, 60 Ldn is a guideline which cannot necessarily be reached in all residential areas within the constraints of economic or aesthetic feasibility. This guideline will be primarily applied where outdoor use is a major consideration (e.g., backyards in single family housing developments, and recreational areas in multiple family housing projects). Where the City determines that providing an Ldn of 60 dB or lower outdoors is not feasible, the noise level in outdoor areas intended for recreational use should be reduced to as close to the standard as feasible through project design.
- The indoor noise level as required by the State of California Noise Insulation Standards must not exceed an Ldn of 45 dB in multiple family dwellings. These indoor criteria shall also apply to new single family homes in Palo Alto.
- Interior noise levels in new single family and multiple family residential units exposed to an exterior Ldn of 60 dB or greater should be limited to a maximum instantaneous noise level of 50 dB in the bedrooms. Maximum instantaneous noise levels in other rooms should not exceed 55 dB.

Noise exposure can be determined based on the noise contour map included in this plan, or more detailed noise measurements, if appropriate.

Policy N-40 – Evaluate the potential for noise pollution and ways to reduce noise impacts when reviewing development and activities in Palo Alto and surrounding communities.

Noise impacts associated with new development include both short-term construction impacts and long-term operational impacts, including traffic. City policies address both sources. Construction activities are regulated to minimize disturbances to surrounding uses. Long-term impacts are reduced through a number of measures, including design and construction methods that reflect or absorb sound, landscaping and barriers, and site planning to reduce noise exposure. Areas where residential and non-residential uses are mixed or close together are a particular concern. Design of new projects should reduce noise from parking, loading, and refuse storage areas and from heating, ventilation, and air conditioning apparatus.

Policy N-41 – When a proposed project is subject to CEQA, the noise impact of the project on existing residential land uses should be evaluated in terms of the increase in existing noise levels and potential for adverse community impact, regardless of existing background noise levels. If an area is below the applicable maximum noise guideline, an increase in noise up to the maximum should not necessarily be allowed. A project should be considered to cause a significant degradation of the noise environment if it meets any of the following criteria:

- The project would cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB;
- The project would cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB;
- The project would cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.

Policy N-42 – The City may require proposals to reduce noise impacts of development on adjacent properties through appropriate means including, but not limited to, the following:

- Construct noise walls when compatible with aesthetic concerns.
- Screen and control noise sources such as parking, outdoor activities and mechanical equipment.
- Increase setbacks for noise sources from adjacent dwellings.
- Whenever possible, retain fences, walls or landscaping that serve as noise buffers although design, safety and other impacts must be addressed.
- Use soundproofing materials and double-glazed windows.
- Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.

Policy N-43 – Protect the community and especially sensitive noise receptors, including schools, hospitals, and senior care facilities, from excessive noise.

City of Palo Alto Municipal Code

Section 9.10 of the Palo Alto Municipal Code establishes noise limits specific to land use for non-construction-related noise. The Ordinance prohibits a noise level more than six dB above the local ambient at any point outside of a residential property plane, eight dB above the local ambient at any point outside of a commercial property plane, and fifteen dB above the local ambient at any point outside of a public property plane.

Noise from construction, alteration and repair activities which are authorized by valid city building permit are prohibited on Sundays and holidays and are otherwise allowed between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday, 9:00 a.m. and 6:00 p.m. on Saturday, provided that:

- No individual piece of equipment produces a noise level exceeding 110 dBA at a distance of twenty-five feet.
- The noise level at any point outside of the property plane of the project does not exceed 110 dBA; and
- The holder of a valid construction permit for a construction posts a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen and all other persons at the construction site, of the noise requirements of the ordinance.

The City of Palo Alto allows exceptions to its noise ordinance requirements if the applicant can show through diligent investigation of available noise abatement techniques that immediate compliance would be impractical or unreasonable. In such cases, the City may issue a permit with appropriate conditions to minimize public detriment.

5.11.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on noise and vibration if it would:

a) Expose people to or generate noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) Expose people to or generate excessive groundborne vibration or groundborne noise levels;

c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels; or

f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Approach to Analysis

For the purposes of assessing exposure of people to noise levels in excess of standards, the analysis is separated into construction impacts and operational impacts as the County has established separate standards for these noise sources.

Construction

Similar to the construction air quality analysis, construction-related noise effects are estimated for a peak construction scenario using the same off-road equipment assumptions generated by the CalEEMod model. Because the location of a given construction project under the proposed 2018 General Use Permit could vary as well as its proximity to sensitive receptors, noise levels were calculated for a variety of distances using the Roadway Construction Noise Model. Predicted noise levels are then compared to the construction noise standards of the County Ordinance Code.

Additionally, predicted noise levels during construction are compared to existing monitored noise levels to consider effects on ambient conditions addressed in significance criterion d). Because construction is an inherently noisy activity and is generally conducted during daytime hours, a less stringent threshold of 15 dB above the local ambient noise level at any point outside of a

public property plane is applied which is also a standard used in Section 9.10.050 of the City of Palo Alto's municipal code with regard to public property noise limits. While the City of Palo Alto's municipal code does not govern activity on Stanford's lands in unincorporated Santa Clara County, it provides a useful reference where the County's code is silent. The 15 dBA above existing noise levels threshold is used as a measure of a substantial temporary increase warranting implementation of mitigation measures.

Operation

Under the proposed 2018 General Use Permit operational noise would potentially occur from increased traffic volumes on local roadways, as well as from potential stationary sources of noise such as mechanical equipment (e.g., HVAC systems) and activity at loading docks.

Increases in traffic noise along roadways are assessed using the traffic noise model of the Federal Highway Administration and traffic volumes estimated in the Transportation Impact Analysis (Appendix TIA).[3A] Because there are not specific quantitative standards for addressing traffic noise increases in the County Ordinance Code or General Plan, this analysis uses the methodology contained in Policy N-41 of the City of Palo Alto Comprehensive Plan which provides the following significance criteria with respect to assessing traffic noise impacts under CEQA:

- The project would cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB;
- The project would cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB;
- The project would cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.

Operational increases in noise from stationary sources are qualitatively assessed given that source and receiver distances are not known at this time. Noise impacts of specific development projects approved pursuant to the 2018 General Use Permit would be evaluated during the County approval process(es) for those particular projects.

Vibration

The proposed Project would result in significant impacts if it were to generate vibration levels substantial enough to damage nearby structures or buildings, or result in vibration levels that are commonly accepted as an annoyance to sensitive land uses.

With the exception of the Santa Clara County Code for vibration described above, no local regulations of the affected jurisdictions in the Project vicinity address vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local

[3A] It should be noted that while certain 2035 Cumulative Baseline and 2035 Cumulative Baseline with Project traffic volumes were modified in the revised TIA in Appendix TIA-REV and reflected in Section 5.15 Transportation and Traffic as revised, these revisions did not affect any roadside noise level conclusions in Section 5.11, Noise and Vibration, and consequently no revisions to the traffic volumes in this section were required.

standards for vibration from construction equipment, the following analysis uses the vibration thresholds published by Caltrans presented in **Table 5.11-5**, below. For adverse human reaction, this analysis applies the "strongly perceptible" vibration threshold of 0.1 in/sec PPV (Caltrans, 2013b). For risk of architectural damage to historic buildings and structures, this analysis applies a vibration threshold of 0.12 in/sec PPV (Wilson, Ihrig, & Associates et al., 2012). A vibration threshold of 0.3 in/sec PPV is used for architectural damage to all other buildings.

TABLE 5.11-5
VIBRATION THRESHOLDS

	Maximum Peak Particle Velocity (PPV), inches per second (in/sec)
Adverse human reaction[a]	0.1
Historic buildings and structures[b]	0.12
All other structures	0.3

NOTE: The vibration criteria is based on continuous or frequent intermittent sources, including impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCES:
[a] Caltrans, 2013b.
[b] Wilson, Ihrig & Associates et al., 2012.

Land uses with operations that could be considered to have sensitivity to vibrations include those with vibration-sensitive equipment and university research operations. The degree of sensitivity to vibration depends on the specific equipment that would be affected by the vibration as well as on the design of the specific building in which the equipment is located. Construction vibration effects on sensitive equipment would be a concern for users of research buildings and could be an inconvenience. However, this equipment is not considered a human receptor.

Topics with No Impact or Otherwise Not Addressed in this EIR

Based on the California Supreme Court ruling described above, CEQA does not require lead agencies to consider how existing environmental conditions might affect a project's users or residents, except where the proposed project would exacerbate the existing environmental condition. Accordingly, the proposed 2018 General Use Permit was determined to have no potential impact on significance criteria (e) and (f):

> **For a project located within an airport land use plan area, or within the vicinity of a private airstrip, would the project expose people residing or working in the area to excessive noise levels –** As discussed in the regulatory setting above, the Santa Clara County Airport Land Use Commission's Comprehensive Land Use Plan for Moffett Federal Airfield and Palo Alto Airport indicates that Project site is not located within the Airport Influence Area for either airport. In addition, as the proposed Project would not directly result in an increase in aircraft operations, or SUMC heliport operations, it would not exacerbate an existing condition. Therefore, noise from aircraft and heliport operations would not be expected to have an adverse impact on proposed sensitive receptors at the Project site, and this criterion is not discussed further.

Additionally, the concept of noise exposure to proposed sensitive uses is not addressed in this EIR. In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015, the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might affect a project's users or residents, except where the proposed project would exacerbate the existing environmental condition. Accordingly, the identified significance criteria related to exposure of people, including sensitive receptors, to excessive noise levels or vibration are valid only to the extent that the Project significantly contributes to those noise conditions. Housing developed under the proposed 2018 General Use Permit would be multi-family housing, and therefore subject to the interior noise reduction requirements of CCR, Title 24, thereby ensuring interior noise level exposure of 45 dBA or less.

Impact Evaluation

Construction Impacts

Impact 5.11-1: The Project could expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction. (*Significant*)

The proposed 2018 General Use Permit would allow for construction of up to 3,150 net new residential units/beds, 2.275 million square feet of net new academic and academic support space, 40,000 square feet of child care or space supporting programs to reduce vehicle trips, parking structures and other infrastructure improvements over an approximately 17-year period. Construction activities would involve demolition, site preparation, grading and excavation, trenching, building exteriors, interior architecture, and paving, which would temporarily increase ambient noise levels in the vicinity of construction sites. Construction-related noise levels would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment at each construction site. The effect of construction noise would depend upon the phasing of construction, level of construction activity on a given day, distance between construction activities and the nearest noise sensitive land uses, presence or absence of barriers between the noise and the receptor, and the existing noise levels at the receptors.

Construction, although typically temporary, short-term and/or intermittent, can be a substantial source of noise. Construction is of greatest concern where it takes place near noise-sensitive land uses, or occurs at night and/or in early morning hours, but can also affect commercial uses and other receptors. Local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of General Plan policies, and/or imposition of conditions of approval for building or grading permits. The following analysis addresses potential construction impact to off-site receptors with respect to standards established in applicable noise ordinances and General Plan policies. Potential construction-related impacts to on- and off-site site receptors are addressed in Impact 5.11-2 with respect to temporary increases in noise levels above ambient conditions.

To provide an estimate of potential construction-related noise, construction-related noise impacts were estimated for a peak construction scenario using the same off-road equipment assumptions

generated by the CalEEMod model that were used for the air quality impact analysis (see Section 5.2). Because the location of a given construction project under the proposed 2018 General Use Permit could vary along with its proximity to sensitive receptors, noise levels were calculated for a variety of distances using the Roadway Construction Noise Model. **Table 5.11-6** presents the estimated construction noise for various phases of construction activity at distances of 50, 100, 150 and 300 feet from the construction site.

TABLE 5.11-6
NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT VARIOUS DISTANCES

Distance from Construction Site	Noise Levels in dBA (Hourly Leq)				
	Demolition	Site Preparation	Grading	Building Construction	Paving
50 feet	85.1	80.4	79.7	83.5	83.5
100 feet	79.1	74.4	73.7	77.5	77.5
150 feet	75.5	70.9	70.2	74.0	74.0
300 feet	69.5	64.9	64.2	68.0	67.9

SOURCE: Adapted from Bolt Baranek and Newman, 1971.

The Santa Clara County Ordinance Code establishes different construction noise limits for different land use areas. The most restrictive construction noise limit is 75 dBA for mobile equipment at single family residential areas, such as those off-site residences located across Stanford Avenue from the Project site (see Table 5.11-4). Although the County ordinance does not identify a construction noise limit for schools, it is reasonable to also apply this noise limit to nearby schools, day care facilities and other noise sensitive receptors. As can be seen from Table 5.11-6, construction closer than 150 feet from off-site receptors would have the potential to result in noise levels in excess of the County's noise standard, which would be a potential significant impact. While Palo Alto's noise ordinance does not govern construction on the Project site, it is noted that the predicted noise levels in Table 5.11-6 are all below the City of Palo Alto's construction noise standard of 110 dBA.

Under the 2000 General Use Permit, Stanford did not conduct impact pile driving on any construction projects. Rather, Stanford opted to install piles though a drill and cast-in-place technique on construction projects to avoid the noise and vibration impacts that would otherwise be associated with impact pile driving. Similarly, as stated in the Project Description, during the life of the proposed 2018 General Use Permit, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods to minimize potential noise and vibration disruption.

The County Ordinance Code establishes restrictions on the hours of noisy construction activity. The County Ordinance Code prohibits such activity on weekdays and Saturday between the hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, except for emergency work of public service utilities or by variance. If Project construction activities were to occur within these prohibited hours, the Project would be considered to result in a significant impact, irrespective of whether a variance is granted. **Mitigation Measure 5.11-1** would ensure that construction that

occurs under the proposed 2018 General Use Permit would be consistent with the County's noise ordinance. It is noted that the Palo Alto Municipal Code is slightly more restrictive, prohibiting such work between the hours of 6:00 p.m. and 8:00 a.m. Monday through Friday and between 6:00 p.m. and 9:00 a.m. on Saturday, or at any time on Sundays and holidays.

Mitigation Measure 5.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* If construction would be within 150 feet of off-site sensitive receptors, Stanford shall employ noise attenuation measures to reduce the generation of construction noise to achieve a performance standard of 75 dBA at the affected property line of the nearest off-site single family residential receptor and 80 dBA at the affected property line of the nearest off-sitemulti-family residential receptor. These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards set forth in the County Ordinance Code.

Additional measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- For construction within the Project site that would be 150 feet of sensitive receptors located within the City of Palo Alto, hours of construction activity shall be restricted to those established in the City of Palo Alto Noise Ordinance (i.e., between the hours of eight a.m. to six p.m. Monday through Friday, and between nine a.m. and six p.m. on Saturday).

  For construction within the Project site that would be 150 feet of sensitive receptors located within all other residential areas, hours of construction activity shall be restricted to those established in the Santa Clara County Noise Ordinance (i.e., between seven a.m. and seven p.m., Monday through Saturday).

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 75 dBA;

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and

- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Emission of sound in the performance of emergency work is exempt from these requirements. In addition, variances to these restrictions may be allowed, with County

approval, for certain utility work or other construction for which nighttime work would avoid secondary impacts (e.g., traffic impacts during commute periods); and where compliance with the noise thresholds is technically or economically infeasible. A variance may be granted only where the activity will not create a nuisance and will not be detrimental to the public health and safety.

Significance after Mitigation: Less than Significant.

Impact 5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity. (*Significant*)

The potential exists for construction-related noise generated by the proposed Project to be consistent with the standards established in the local general plan and noise ordinance assessed above in Impact 5.11-1, and still result in a substantial temporary or periodic increase in ambient noise levels. Temporary increases in construction noise would potentially affect both on-site and off-site receptors.

Potential Construction-Related Noise Increases Impacts at Off-Site Receptors

Off-site sensitive receptors near Stanford development districts designated for development under the proposed 2018 General Use Permit (see Figure 3-8 in the Project Description) include those along Stanford Avenue (e.g., Escondido Elementary School and residences in the College Terrace neighborhood), across El Camino Real (e.g., residences in the Southgate neighborhood) and residences along the northwest side of Sand Hill Road. As indicated in Table 5.11-1, existing daytime noise levels at these sensitive receptor locations (e.g., ST-6, ST-7, and LT-1) range from 60 to 64 dBA. The nearest off-site sensitive receptors are located as close as 80 feet from the Project site boundary. As shown in Table 5.11-6, construction noise levels could be as high as 80 dBA at 100 feet. If Project construction were to occur at or near the Project site boundary, construction noise levels would be 15 to 20 dBA above existing ambient noise levels at off-site sensitive receptors and potentially higher at on-site receptors, which would be a significant impact. **Mitigation Measure 5.11-1** identified above, which implements a performance standard, will reduce this impact, where it is technically and economically feasible to do so. It is expected that individual projects that would occur under the proposed 2018 General Use Permit would be subject to additional review through the County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, and because it is unknown whether conditions justifying a variance might occur, it is possible that temporary or periodic increases in ambient noise in the Project site vicinity would remain significant, even with implementation of noise reduction mitigation. Consequently, this impact is considered significant and unavoidable.

Potential Construction-Related Noise Increases Impacts at On-Site Receptors

Within the Project site, residential uses inclusive of on-site residential, day care or instructional classroom land uses would be considered noise sensitive to potential construction-related impacts of the proposed Project. These on-site receptors could be 50 feet or closer to construction activities that would occur under the proposed 2018 General Use Permit. Consequently, temporary construction-related noise increases to on-site receptors could be 15 dBA or greater, and thus would also be significant. As is done currently, under the 2018 General Use Permit, Stanford would manage and modify its instructional classroom activities as needed to ensure temporary construction noise-related effects to instructional classroom land uses would be less than significant. **Mitigation Measure 5.11.2** identifies a minimum construction noise performance standard for noise effects to on-site residential or day care land uses that will reduce construction noise impacts, where it is technically and economically feasible to do so. It is expected that individual projects that would occur under the proposed 2018 General Use Permit would be subject to additional review through the County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given that the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, it is possible that temporary or periodic increases in ambient noise in the Project site vicinity would remain significant, even with implementation of noise reduction mitigation. Consequently, this impact is considered significant and unavoidable.

> **Mitigation:** Implement Mitigation Measure 5.11-1 noise impacts at off-site receptors.
>
> **Mitigation Measure 5.11-2:** *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* For construction activities over two weeks in duration, and within 150 feet of on-site sensitive receptors, Stanford shall identify noise attenuation measures to reduce the generation of construction noise to achieve a minimum performance standard of 80 dBA, Leq over an 8-hour period at the nearest on-site residential or day care land use.[4] These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards.
>
> If necessary to achieve the minimum performance standard stated above, measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:
>
> - Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 80 dBA;
> - Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid

[4] Consistent with noise criteria used by FTA for construction activities in vicinity of residential land uses (FTA, 2006).

noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and

- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Significance after Mitigation: Significant and Unavoidable.

Impact 5.11-3: Project construction could result in temporary exposure of persons to or generation of, excessive groundborne vibration or groundborne noise levels in the Project site vicinity. (*Significant*)

A variety of construction activities can propagate ground-borne vibration, demolition (e.g., use of hoe-rams for demolishing large concrete structures), grading activities (e.g., use of vibratory rollers for soil compaction) and pile installation for foundations. As explained in the Project Description, during the life of the proposed 2018 General Use Permit, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place piles) to minimize potential noise and vibration disruption.

The vibration threshold for architectural damage to historic buildings and structures is 0.12 PPV (in/sec), the vibration threshold for damage to all other structures is 0.3 in/sec, and the vibration threshold for an adverse human reaction is 0.1 in/sec (see Table 5.11-5). As discussed in Section 5.4, Cultural Resources, Stanford's historic inventory identified 74 historic structures within the Project site. This impact analysis conservatively assumes that construction under the proposed 2018 General Use Permit could occur within the immediate vicinity of one or more historic structures.

Groundborne vibration from Project grading, excavation, and building construction could produce substantial temporary vibration levels at nearby sensitive receptors, as well as at nearby structures. The extent to which these receptors and structures would be affected by groundborne vibration depends largely on soil conditions, building design and materials, construction techniques employed, distance from the construction site to the receptor and structure, and the age and condition of the structure.

Typical reference vibration levels for various pieces of construction equipment are listed below in **Table 5.11-7**.

TABLE 5.11-7
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment/Activity	PPV at 25 ft (inches/second)[a]
Jackhammer	0.035
Loaded Trucks	0.076
Caisson Drilling (represents Auger Drilling Pile Installation)	0.089
Large Bulldozer	0.089
Hoe Ram	0.089
Vibratory Roller	0.210

SOURCE: FTA, 2006 (Table 12-2, p. 12-12).

As shown in Table 5.11-7, the use of vibratory rollers would have the potential to create the greatest vibration levels during construction. Based on the vibration velocities in Table 5.11-7, vibratory rollers would have the potential to cause damage to historic buildings and structures to if it were to occur within an estimated 40 feet of those structures. This would also be the distance from residential land uses at which the adverse human reaction of 0.1 in/sec would start to be exceeded. Construction activities would have the potential to cause damage to modern structures at a distance of 20 feet.

Due to the proximity of historic structures within the Project site to construction activities that would occur under the proposed 2018 General Use Permit, Project construction vibration levels could exceed building damage and adverse human reaction threshold, resulting in a potentially significant impact. Implementation of **Mitigation Measure 5.11-3** would address this impact, and ensure it would be reduced to a less-than-significant level.

> **Mitigation Measure 5.11-3:** *Construction Vibration Reduction Plan.* If construction involving vibratory rollers, hoe rams, or large bulldozers is proposed within 40 feet of an historic structure, Stanford shall develop a Vibration Reduction Plan in coordination with an acoustical consultant, geotechnical engineer, and/or construction contractor, for review and approval by the County Planning and Development Department. Measures and controls shall be identified based on project-specific final design plans, and may include, but are not limited to, either or both of the following:
>
> 1. Use non-vibratory excavator-mounted compaction wheels and small smooth drum rollers for final compaction of asphalt base and asphalt concrete. If needed to meet compaction requirements, smaller vibratory rollers will be used to minimize vibration levels during repaving activities where needed to meet vibration standards.
>
> 2. Implementation of buffers and the use of specific types of equipment to minimize vibration impacts during construction at nearby receptors in order to meet a performance standard of 0.12 inches per second PPV at historic buildings and 0.3 inches per second PPV at non-historic buildings.
>
> 3. Implementation of a vibration, crack, and line and grade monitoring program for identified historic buildings located within 40 feet of construction activities, in coordination with a geotechnical engineer and qualified architectural historian.

Significance after Mitigation: Less than Significant.

Operational Impacts

Impact 5.11-4: The Project could increase long-term noise levels in the Project vicinity to levels in excess of applicable noise standards. (*Significant*)

New development under the proposed 2018 General Use Permit would generate noise from heating, ventilating, and air conditioning mechanical equipment that would serve each building. Emergency backup generators, if required for new buildings, would be tested regularly and operated occasionally. Typically, the Bay Area Air Quality Management District (BAAQMD) permits emergency backup generators to operate for up to 50 hours per year, or on average about one hour per week.

While the specific location of new buildings (and associated building mechanical equipment) that would be developed, and the distance to the nearest sensitive receptors, is not known at this time, development under the proposed 2018 General Use Permit would occur on County lands and therefore would be required to comply with the noise restrictions of the Santa Clara County noise ordinance.

Future uses within the Project area could require loading docks. Truck deliveries at loading docks would generate noise as a result of truck arrivals and departures from the unloading area, trucks backing into the docks (including backup beepers), air brakes, and other truck unloading-related noise. These activities would be a source of elevated noise levels at nearby sensitive receptors. Noise levels of 80 dBA L_{max} and 60 dBA L_{eq} at a distance of 50 feet can be generated during loading dock activities (ESA, 2008).

Existing off-site sensitive receptors in the jurisdictions of Palo Alto and Menlo Park are located as close as 80 feet to the Project site. Consequently, it is conservatively assumed that mechanical equipment operation and loading dock activity from new development under the proposed 2018 General Use Permit could increase noise levels at the nearest off-site sensitive receptor by more than the 6 dBA allowed by the City of Palo Alto Noise Ordinance and create a noticeable increase in ambient noise levels above baseline noise levels. As such increased noise from building mechanical equipment under the proposed General Use Permit is identified as a potential significant impact.

As discussed above, off-site noise impacts are evaluated at the Project boundary. Off-site sensitive receptors are primarily in the jurisdictions of the cities of Palo Alto and Menlo Park. The mitigation measures identified apply the most stringent (City of Palo Alto) noise standards.

Existing on-site sensitive receptors could be located in the immediate vicinity of stationary noise sources, and therefore may also be significantly impacted by these noise sources.

Mitigation Measure 5.11-4: *Shield or Enclose HVAC Equipment and Emergency Generators.* Noise levels from mechanical equipment within 150 feet of sensitive

receptors shall be minimized by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment achieves the following noise standards at the property line of an offsite sensitive land uses in Palo Alto or Menlo Park, or at the nearest on-site residential, day care or instructional classroom land use:

- The project shall not cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB;
- The project shall not cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB;
- The project shall not cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.

Noise levels from the periodic testing of emergency generators within 150 feet of sensitive receptors in the cities of Palo Alto or Menlo Park also shall be minimized by proper siting and through installation of acoustical shielding. Scheduled testing of an emergency generator must not occur before 7:00 a.m. or after 7:00 p.m.

Significance after Mitigation: Less than Significant.

Impact 5.11-5: Project traffic would not substantially increase traffic noise levels in the vicinity of the Project site. (*Less than Significant*)

Additional traffic generated by the proposed 2018 General Use Permit would increase noise levels on the roadway network. As discussed under Approach to Analysis, a Project traffic-related ambient noise increase of either 3 or 5 dBA or more would be considered a significant impact, depending the existing roadway noise levels, where sensitive receptors are located along the affected roadway segments. Traffic noise levels for this analysis were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model and the turning movements for the 2018 Baseline and 2018 Baseline plus Project conditions from the transportation analysis (see Section 4.13, Transportation and Traffic in this EIR).[5] Traffic noise level projections were made for those road segments that would experience the greatest increase in traffic volumes and that are in proximity to sensitive receptors. It should be noted that the 2018 Baseline plus Project scenario is conservative in that it assumes the entire buildout of the proposed 2018 General Use Permit in 2018 (and associated traffic and traffic-related noise), even though full buildout of the Project is not expected until 2035.

The roadway segments analyzed and results of the modeling are shown in **Table 5.11-8**. As shown in Table 5.11-8, under the 2018 Baseline plus Project scenario traffic noise would increase

[5] The model is based on Calveno reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume and speed.

no more than 0.5 dBA (less than the minimum 3 dBA threshold) on all evaluated roadway segments. Therefore, development under the proposed 2018 General Use Permit would result in a less than significant operational traffic noise impact.

Mitigation: None required.

TABLE 5.11-8
TRAFFIC ROADSIDE NOISE LEVELS IN THE PROJECT SITE VICINITY

Roadway Segment	Baseline (2018) (A)	Baseline Plus Project (2018) (B)	Difference between Baseline Plus Project and Baseline (B-A)	Cumulative No Project (2035) (C)	Cumulative Plus Project (2035) (D)	Difference between Cumulative Plus Project and 2018 Baseline (D-A)	Difference between Cumulative Plus Project and Cumulative No Project (D-C)
Sand Hill Road							
between Stock Farm Road and Pasteur Drive	70.3	70.5	0.2	70.5	70.7	0.4	0.2
between Santa Cruz Avenue and Stock Farm Road	70.9	71.2	0.3	70.9	71.1	0.2	0.2
between Saga Lane and Sharon Park Drive	70.9	71.1	0.2	70.7	70.9	0.0	0.2
El Camino Real							
between Churchill Avenue and Serra Street	71.2	71.4	0.2	72.4	72.6	1.4	0.2
Junipero Serra Boulevard							
between Campus Drive and Stanford Avenue	68.1	68.4	0.3	68.7	68.9	0.8	0.2
between Stanford Avenue and Page Mill Road	68.7	69.2	0.5	69.4	69.8	1.1	0.4
Foothill Expressway							
between Arastadero Road and Edith Avenue	72.3	72.5	0.2	74.2	74.3	2.0	0.1
Alpine Road							
between I-280 and Junipero Serra Boulevard	69.8	70.2	0.4	70.2	70.5	0.7	0.3
Oregon Expressway							
between El Camino Real and Middlefield Road	71.3	71.4	0.1	71.9	72.0	0.7	0.1
Embarcadero Road							
between Town & Country and Middlefield Road	65.9	66.2	0.3	67.1	67.3	1.4	0.2
Stanford Avenue							
between Bowdoin Avenue and El Camino Real	61.3	61.7	0.4	61.6	62.0	0.7	0.4

NOTES:

Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

Cumulative Impacts

The geographic area considered for cumulative noise analysis includes areas within and surrounding the Project site and roadways examined in the transportation analysis in Section 5.15, Transportation and Traffic. Cumulative development contributing to the existing and future noise environment includes those projects in the development forecasts conducted for this EIR based on the countywide transportation model. There is not expected to be any cumulative vibration effects

because it is unlikely that a project from outside the project area would be in close enough proximity to contribute to vibration effects of the Project. Consequently, vibration would not be a cumulative issue, and is not addressed further.

Impact 5.11-6: Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to cumulative noise impacts. (*Significant*)

Development under the proposed 2018 General Use Permit may be constructed during the same time and duration as cumulative projects in the area, and could result in a contribution to construction noise levels. The geographic study area for cumulative construction impacts is defined as a 500-foot radius around the Project site. This screening threshold distance was developed based on stationary source noise attenuation equations (Caltrans, 2013) and the combined noise level generated by typical construction phases for a given project (assuming multiple pieces of equipment) at a distance of 50 feet. A maximum noise level of 89 dBA for non-pile driving equipment would diminish to 69 dBA at 500 feet, which would be a typical noise level in proximity to high volume roadways.

The most notable off-site cumulative project that would generate construction noise within this screening distance would be the final stages of construction for the SUMC Renewal Project. Construction noise impacts associated with the SUMC Renewal Project were identified as significant and unavoidable at both the project-level and cumulative scenario in the *Stanford University Medical Center Facilities Renewal and Replacement Draft EIR*. The great majority of construction associated with the SUMC Renewal Project would be completed prior to commencement of construction under the 2018 General Use Permit. However, the SUMC Renewal Project's replacement buildings for the School of Medicine and some of that project's hospital/clinic square footage would be constructed during implementation of the 2018 General Use Permit, and consequently could overlap with construction under the proposed 2018 General Use Permit.

Given that construction noise from development under the proposed 2018 General Use Permit would be significant, as described under Impacts 5.11-1 and 5.11-2, and that construction noise from the SUMC Renewal Project would be significant, there could be a potential for significant cumulative construction noise impact. Consequently, mitigation measures are identified to limit the cumulative contribution of noise from construction under the proposed 2018 General Use Permit. The proposed Project's contribution to cumulative construction noise impacts would be reduced with mitigation, but not to a level that is less than significant for the reasons provided in the discussion of Impact 5.11-2.

Mitigation: Implement Mitigation Measure 5.11-1, *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors,* and Mitigation Measure 5.11-2, *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Significance after Mitigation: Significant and Unavoidable.

Impact 5.11-7: Project traffic in combination with traffic from cumulative development would not contribute considerably to cumulative noise impacts. (*Less than Significant*)

Long-term noise from cumulative development would primarily occur from motor vehicle traffic. When considered alone, development under the proposed 2018 General Use Permit would generate noise mainly by adding more traffic to area roads and streets. Other anticipated projects would also contribute increased traffic volumes that would generate noise in the area. Any project that would individually have a significant project level noise impact would also be considered to have a significant cumulative noise impact.

As indicated above under Approach to Analysis, a permanent noise increase of 3 dBA or 5 dBA or more in ambient noise levels in the vicinity above levels existing without the Project would be considered to generate a significant impact. Traffic noise levels at intersections most affected by traffic from buildout of the proposed 2018 General Use Permit were modeled using the FHWA Traffic Noise Prediction Model and the turning movements for the existing conditions, Cumulative No Project (2035) and Cumulative plus Project (2035) conditions. The segments analyzed and the results of the noise modeling are shown in Table 5.11-8.

As shown in Table 5.11-8, the increase in traffic noise between the Baseline (2018) and Cumulative Plus Project (2035) scenario would be no more than 2.0 dBA (less than the minimum 3 dBA threshold) at all analyzed roadway segments. Therefore the cumulative traffic noise impact would be less than significant.

Mitigation: None required.

5.11.6 References

Bolt, Baranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, December 1971.

Caltrans, 2013. Technical Noise Supplement to the Caltrans Noise Analysis Protocol. September 2013.

Caltrans, 2013b. *Transportation and Construction Vibration Guidance Manual*. September 2013.

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Federal Transit Administration (FTA), 2006. Transit Noise and Vibration Impact Assessment. May 2006.

City of Palo Alto 2010. *Stanford University Medical Center Facilities Renewal and Replacement Draft EIR*, May 2010.

Santa Clara County, 2008. *Comprehensive Land Use Plan – Palo Alto Airport*, Amended November 16, 2016.

Santa Clara County, 2008. *Comprehensive Land Use Plan –Moffett Federal Airfield,* Amended November 18, 2016.

Stanford University Medical Center (SUMC) Project Renewal Overview and Timetable Available online at http://www.sumcrenewal.org/projects/project-overview/ accessed June 8, 2017.

Wilson, Ihrig & Associates, Inc., ICF International, and Simpson, Gumpertz & Hege, Inc., 2012. *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects*. September 2012.

5.12 Population and Housing

5.12.1 Introduction

This section addresses the Project's potential impacts on population and housing conditions in the area and the potential for adverse impacts as a result of campus operations and development under the proposed 2018 General Use Permit. The section includes a description of the existing and 2018 baseline environmental settings related to population and housing, and presents a discussion of applicable federal, State, and County regulations. The section includes an evaluation of the potential for implementation of the proposed 2018 General Use Permit to induce substantial population growth or displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere. The section then identifies regulatory mechanisms and/or feasible mitigation measures, as necessary, to reduce potential impacts associated with population and housing. The section relies in part on the Anticipated Changes to Population Report, submitted by Stanford as part of the 2018 General Use Permit Application (see Appendix POP), and Technical Data to Address Population and Associated Housing Demand (Appendix PHD), also submitted by Stanford. Both reports were independently peer reviewed by ESA.

5.12.2 Existing Environmental Setting

The Project site is located within unincorporated Santa Clara County; therefore, population and housing effects related to the proposed Project would be experienced directly on Stanford lands under the jurisdiction of Santa Clara County. Adjacent and nearby communities would also be affected by changes in population and housing attributable, directly and indirectly, to growth under the proposed 2018 General Use Permit.

Population

Stanford

Students, Faculty and Staff

Table 3-2 in Chapter 3, Project Description presents a summary of the existing Stanford population, including students, faculty and staff. The population include all undergraduate and graduate students, postdoctoral scholars, non-matriculated students, and regular benefits-eligible faculty and staff. Postdoctoral scholars are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member. Nonmatriculated students are students taking courses or engaged in graduate-level research or training but are not seeking a degree. Faculty refers to professoriate faculty members and regular benefits-eligible employees in academic/instructor positions. Staff refers to regular benefits-eligible employees generally in nonacademic positions such as human resources, information technology, facilities, financial aid. As shown in Table 3-2, as of Fall 2015, Stanford had a total of 30,943 students, faculty and staff.

The on-campus residential population includes the portion of the students, faculty and staff in Table 3-2 that live on-campus, in addition to family members of those graduate students and faculty/staff that live on-campus. As of Fall 2015, the on-campus residential population was estimated at 14,902, including 12,367 students, faculty and staff, and 2,535 family members of graduate students and faculty/staff.

Other Workers

Table 3-3 in Chapter 3 presents a summary of existing other worker populations that also contribute to the total on-campus population at Stanford. This group includes casual, contingent, and temporary hourly employees working less than 50 percent of a full-time equivalent (FTE) employee, affiliated teaching staff, adjunct professors, visiting scholars, third-party contract workers, janitorial contract workers, and construction contract workers. As shown in Table 3-3, as of Fall 2015, there were 8,826 of the other worker populations at Stanford. Because some of these populations are only on campus part of the year, they have a proportionally smaller impact on the daily campus population. Based on their commute frequency, the daily population of these other workers is estimated at approximately 5,136.

Regional

Santa Clara County is part of the nine-county Bay Area, which had an estimated population of 7.6 million people in 2015 (ABAG/MTC, 2017a). **Table 5.12-1** shows the population of jurisdictions in the vicinity of Stanford in 2010 and 2017, and the total population of Santa Clara and San Mateo counties. This table also shows the 2010 population of the Stanford Census-Designated Place (CDP), which mostly corresponds with the portion of the Project site north of Junipero Serra Boulevard (i.e., within the Academic Growth Boundary).

TABLE 5.12-1
POPULATION OF LOCAL AND REGIONAL JURISDICTIONS

	2010	2017
Stanford CDP	13,809	N/A
City of Palo Alto	64,403	68,691
City of Menlo Park	32,026	35,670
Town of Portola Valley	4,353	4,707
Town of Woodside	5,287	5,666
Town of Los Altos Hills	7,922	8,634
Santa Clara County (Total)	1,781,642	1,938,180
San Mateo County (Total)	718,451	770,203

CDP = Census-Designated Place

SOURCE: U.S. Census Bureau, 2010; California Department of Finance, 2017

Housing

Stanford

Stanford guarantees four years of housing for undergraduate students, and six years of housing priority are given to eligible graduate students. In Fall 2015, the total number of Stanford-operated student beds on the Project site is estimated to be approximately 11,300. Housing options include dormitories; theme houses for language and culture, ethnic, academic and special programs; co-operated and self-operated houses where responsibilities of daily living are shared; and fraternity and sorority houses. Stanford also provided 937 single-family or condominium homes to faculty and staff on the Project site in Fall 2015, which were available via long-term leaseholds or as rentals.

Condition F.8 of the 2000 General Use Permit requires that Stanford's development of academic and academic support space be linked to the development of its housing units. Interim milestones are required to be met for each increment of 500,000 square feet of academic and academic support space to ensure housing construction keeps pace with academic and academic support development and growth.

In addition to providing housing within the boundary of the proposed 2018 General Use Permit, since 2000, Stanford has also developed housing on Stanford lands in the City of Palo Alto, including 628 faculty and staff units at the Stanford West Apartments and 388 independent living senior housing units at the Vi at Palo Alto. Also, 70 below-market housing units were recently completed on El Camino Real in Palo Alto (Mayfield Place), and 112 condominiums and 68 single-family residences are under construction on California Avenue in Palo Alto (University Terrace). Stanford also is pursuing approvals for a transit-oriented, mixed-use and multifamily housing project in Menlo Park that would include over 200 rental housing units available for faculty and staff. In addition, in Los Altos, Stanford recently purchased the newly constructed 167-unit Colonnade Apartments. Stanford affiliates receive priority at Colonnade.[1]

Condition F.6 of the 2000 General Use Permit requires that for each 11,763 square feet of academic development constructed, Stanford shall either: 1) provide one affordable housing unit on the Stanford campus, or 2) make an appropriate cash payment in-lieu of providing the housing unit. Santa Clara County subsequently established the Stanford Affordable Housing Fund for the purpose of funding affordable housing projects within a 6-mile radius of the campus boundary. In accordance with this condition, Stanford contributed over $25 million to fund additional affordable housing in surrounding communities. Stanford has stated that it anticipates that by completion of the 2000 General Use Permit it will have contributed a total of approximately $37-38 million to this fund.

[1] At the Stanford West Apartments and Colonnade Apartments, Stanford prioritizes occupancy by Stanford affiliates. The Vi and Mayfield Place do not prioritize occupancy by Stanford affiliates. University Terrace is for occupancy by Stanford faculty. At the planned housing in Menlo Park, Stanford expects to prioritize all but 10 of those units for Stanford affiliates.

Regional

Over twenty years ago the Santa Clara County General Plan recognized that employment and economic growth in the County was greatly outpacing the housing supply, and the housing that was being constructed at greater distances from major employment centers in the County. These two trends became known as the "jobs-housing imbalance" (County of Santa Clara, 1994).

The principal effects of this imbalance are known to include: increased travel and commute distances; increased traffic congestion; increased automobile dependency; increased housing affordability problems, especially in "job-rich" cities; increased automobile emissions, including greenhouse gas emissions, affecting air quality and contributing to global climate change; increased noise; and overburdened urban services and facilities.

The magnitude of the region's housing problem is discussed prominently in Plan Bay Area 2040, the Bay Area's integrated land use and transportation plan, which was adopted by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) on July 26, 2017. In its analysis of "The Regional Housing Crisis," Plan Bay Area recognizes the lack of housing for the growing number of people who want to live and work in the Bay Area. The limited supply of both market-rate and affordable housing has led to rapidly rising rents and home prices (ABAG/MTC, 2017b).

The term jobs / housing balance refers to the ratio of jobs to housing units in a particular jurisdiction. One way to measure the jobs / housing balance is as a ratio of employees to housing units. In 2011, Santa Clara County was estimated to have jobs to housing ratio of 1.3 employees per housing unit (County of Santa Clara, 2014).

Another measure of the jobs / housing balance is the ratio of workers to employed residents within a community. For 2007-2011, Santa Clara County was estimated to have a ratio of 1.1 workers per employed resident. During the same period, Stanford was estimated to have a ratio of 2.7 workers per employed resident (County of Santa Clara, 2014). As a point of comparison, in 2010, the City of Palo Alto had an estimated jobs to employed resident ratio of 3.04 (City of Palo Alto, 2014).

The availability and affordability of housing in the Bay Area are well-documented issues. In 2015, Santa Clara County had an estimated homeowner vacancy rate of 0.7 percent and rental vacancy rate of 2.7 percent. Palo Alto's homeowner vacancy and rental vacancy rates were 0.7 percent and 3.6 percent, respectively, and San Mateo County's rates were 0.7 percent and 2.5 percent (U.S. Census, 2015).

The affordability of housing in the Bay Area has also been exacerbated by a widening income gap between high- and low-income households. From 1990 to 2015, the total number of households in the Bay Area increased by 20 percent, and most of this growth was concentrated in households with an annual income of $150,000 or more, with the majority of the remaining growth in households earning $35,000 or less annually (ABAG/MTC, 2017b).

According to the Metropolitan Transportation Commission (MTC), the share of Bay Area households excessively burdened by housing costs has increased since 1980, as home prices and rents have spiked at a faster rate than income growth. In 2015, nearly one in three Bay Area households spent at least 35 percent of its income on housing. In Santa Clara County, the proportion of households that spent at least 35 percent of its income on housing was 29 percent and in San Mateo County it was 32 percent. The vast majority of low-income Bay Area households experience an excessive housing cost burden, regardless of where they live. Increasingly, even moderate-income households face excessive cost burdens. For example, nearly 40 percent of Bay Area households earning $50,000 to $75,000 per year spent more than 35 percent of their income on housing in 2015 (MTC, 2017).

From 1990 to 2015, households earning more than $150,000 a year have greatly increased their share of the total number of households in the region, and comprised a vast majority of the regional growth in households over the same period. As a share of total households, those earning between $35,000 and $149,999 have declined significantly, and in absolute numbers have either stagnated or decreased.

Inflation-adjusted home prices have also increased in many communities in the Bay Area. In Santa Clara County, home prices have increased from $624,000 in 2010 to $799,000 in 2015. During this same time period, home prices in Palo Alto have increased dramatically from $1,315,000 to $2,279,000 (MTC, 2017).

Regional Projections

The Association of Bay Area Governments (ABAG) is the regional planning agency for the nine Bay Area counties and forecasts the region's demographic and economic trends. The regional forecast is an important component of Plan Bay Area, the region's first integrated land use and transportation plan, which was adopted by ABAG and the Metropolitan Transportation Commission (MTC) in 2013. The effort grew out of the California Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375), which required all metropolitan regions in California complete a Sustainable Communities Strategy (SCS) as part of a Regional Transportation Plan. MTC and ABAG are jointly responsible in the Bay Area for developing and adopting a SCS that integrates transportation, land use, and housing to meet greenhouse gas (GHG) reduction targets set by the California Air Resources Board. In July 2017, MTC and ABAG adopted an update to the plan, Plan Bay Area 2040, which is a limited and focused update of the 2013 plan.

Table 5.12-2 presents a summary of population, households and employment in in the Bay Area in 2015 and 2040.

Table 5.12-3 presents population for the local and regional jurisdictions in the vicinity of Stanford for 2010 and 2040.

TABLE 5.12-2
POPULATION, HOUSEHOLDS, AND EMPLOYMENT – BAY AREA, 2015 AND 2040 (MILLIONS)

Demographic	2015	2040	2015-2040 Increase	Percent Increase
Population	7.6	9.5	1.9	25%
Households	2.7	3.4	0.7	26%
Employment	4.0	4.7	0.7	18%

SOURCE: ABAG/MTC, 2017a

TABLE 5.12-3
POPULATION OF LOCAL AND REGIONAL JURISDICTIONS – 2010 AND 2035

Jurisdiction	2010	2035	Percent Increase
City of Palo Alto	64,403	80,800	25%
City of Menlo Park	32,026	36,800	15%
Town of Portola Valley	4,353	4,800	10%
Town of Woodside	5,287	5,600	6%
Town of Los Altos Hills	7,922	8,500	7%
Santa Clara County (Unincorporated)	89,960	100,200	11%
Santa Clara County (Total)	1,781,642	2,303,500	29%
San Mateo County (Total)	718,451	869,300	21%

SOURCE: ABAG, 2013b

5.12.3 2018 Baseline Environmental Setting

As discussed in Section 5.0, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of consideration of the proposed 2018 General Use Permit. All of these developments are located within Stanford's Academic Growth Boundary. Accordingly, the population and housing changes associated with these developments are considered as part of the 2018 environmental baseline. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction, but which would not be completed and occupied until 2020. Therefore, the housing units and associated population that would reside in this development are not considered as part of the 2018 environmental baseline. The 2018 environmental baseline also includes all other applicable approved cumulative development and infrastructure in the study area anticipated to be built and occupied by 2018.

Table 5.12-4 presents a summary of estimated Stanford students, faculty and staff populations in Fall 2018. Stanford estimates it will grow by 1,108 students, faculty and staff between Fall 2015 and Fall 2018, reflecting an approximate total compound annual growth rate (CAGR) of approximately 1.2 percent. As shown in Table 5.12-4, in Fall 2018, Stanford would have an estimated 32,051 students, faculty and staff.

TABLE 5.12-4
STANFORD STUDENT, FACULTY, AND STAFF POPULATION– 2018

Affiliation	Stanford Population
Undergraduates	7,085
Graduate Students	9,528
Postdoctoral Students[a]	2,403
Faculty[b]	3,073
On-Campus Staff[c]	8,985
Nonmatriculated Students[d]	977
Total	**32,051**

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

Table 5.12-5 presents the estimated on-campus residential population in Fall 2018. As shown in Table 5.12-5, in Fall 2018, the on-campus residential population is estimated at 15,338, including 12,787 students, faculty and staff, and 2,551 family members of graduate students and faculty/staff.

Table 5.12-6 presents a summary of other worker populations that contribute to the on-campus population at Stanford. As shown in Table 5.12-6, as of Fall 2018, there would be an estimated 9,166 of the additional worker populations at Stanford. Based on their commute frequency, the daily population of these other workers in Fall 2018 is estimated at approximately 5,321.

The number of Stanford student-occupied beds within the Project site is estimated to increase from approximately 11,300 in Fall 2015 to 11,700 in Fall 2018. There is no anticipated change in the number of single-family or condominium homes to faculty and staff on the Project site (937 housing units) between Fall 2015 and Fall 2018.

TABLE 5.12-5
RESIDENTIAL POPULATION RESIDING ON PROJECT SITE– 2018

Affiliation	Residential Population within Project Site Boundary
Undergraduates	6,617
Graduate Students	5,205
Non Student Spouses	660
Children	420[a]
Postdoctoral Students [a]	28
Faculty and Staff [b,c]	937
Other Family Members	1,471[c]
Total	**15,338**

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

TABLE 5.12-6
OTHER WORKER POPULATIONS AT STANFORD – 2018

Affiliation	Population	Anticipated Daily Campus Population
Casual Employees[a]	2,167	434
Contingent Employees[b]	1,021	531
Temporary Employees[c]	1,448	1,130
Non-Employee Academic Affiliates, 20 Percent FTE[d]	1,312	224
Non-Employee Academic Affiliates, FTE[d]	1,435	1,220
Third Party Contract Workers[e]	324	324
Janitorial Contract Workers[f]	259	259
Construction Contract Workers[g]	1,200	1,200
Total	**9,166**	**5,321**

[a] Casual employees are salaried workers with roles that are comparable to staff, working less than 50 percent full-time equivalent (FTE) and/or working less than six months.
[b] Contingent employees are hourly workers less than 50 percent FTE and working no more than 980 hours per year, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[c] Temporary workers are hourly workers at 50 percent FTE or more working no longer than six months, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[d] Other non-employee academic affiliates include affiliated teaching staff, adjunct professors, and visiting scholars. These are not typically full-time positions, with some members of this population visiting the campus less than 20 percent of the time.
[e] Third party contract workers include food service workers at on-campus cafeterias and child care center workers.
[f] Janitorial shift contract workers are third party contractors working off-peak hour morning and evening shifts.
[g] Construction contract workers are related to ongoing construction projects on the campus.

SOURCE: Stanford University Land Use and Environmental Planning Office, 2017

5.12.4 Regulatory Setting

County of Santa Clara

Santa Clara County General Plan

The Santa Clara County General Plan Housing Element Update 2015-2022 was adopted by the County in June, 2014. The following strategies, policies, and implementation measures from the Housing Element Update 2015-2022 are relevant to population and housing:

Strategy #1: Plan for a balanced housing supply

Implementation Measure HG(i) 2: Maintain and update when necessary the Stanford University General Use Permit conditions which link creation of academic space with creation of housing units.

Stanford Community Plan

The Stanford Community Plan is a component of the County of Santa Clara General Plan. The Stanford Community Plan serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The following strategies and policies in the Stanford Community Plan are relevant to population and housing:

Strategy #1: Increase the Supply and Affordability of Housing

***Policy SCP-H 1*:** Promote a variety of housing types and supply adequate to meet the needs of faculty, staff, students, postgraduate fellows, and hospital residents.

***Policy SCP-H 2*:** Designate sufficient campus land at appropriate densities for student, faculty, and staff housing, as identified in Table 3.2 and Figure 3.1, Proposed Housing Development Potential and Sites.[2]

***Policy SCP-H 3*:** Maintain student and postgraduate housing as an integral part of the academic areas of the campus.

***Policy SCP-H 4*:** Develop housing at densities that make more efficient use of land and enhance the affordability of housing.

***Policy SCP-H 5*:** Recognize the connection between expansion of academic facilities and the resultant increase in housing demand, as well as the immediate need for additional on-campus housing to meet address current demand.

***Policy SCP-H 6*:** Through the General Use Permit, permit development of additional on-campus housing, including housing for designated very low-, low- and moderate-income persons and faculty, staff, students, postgraduate fellows, and hospital residents.

***Policy SCP-H 7*:** Require that new housing development occur commensurate with population growth and academic development approvals on campus. Through the

[2] Under the proposed 2018 General Use Permit, Stanford proposes to delete outdated references to Table 3.2 and Figure 3.2 as part of amendments to the Stanford Community Plan.

General Use Permit, establish conditions to require construction of needed housing prior to or concurrently with approval for increases in academic space.

***Policy SCP-H 8*:** Streamline the review and approval of housing projects to the extent possible consistent with County standards, land use policy, and State law.

***Policy SCP-H 9*:** Support Stanford's efforts to develop housing on land in other jurisdictions, particularly housing specifically targeted to Stanford faculty, staff, students, and other affiliated persons. Consider Stanford-developed housing in other jurisdictions eligible to meet quantified housing development requirements on a case-by-case basis.

***Policy SCP-H 9*:** Provide financial assistance for housing to faculty and staff, and consider expanding programs to include rental assistance.

***Policy SCP-H 10*:** Promote the affordability of housing by: a. Requiring Stanford to provide a sufficient level of affordable housing on campus to meet the affordable housing needs generated by new academic development on its unincorporated lands or make an appropriate payment in lieu of providing the housing; and, b. Encouraging Stanford to extend housing assistance and on-campus residence eligibility to populations which have previously not been served.

Strategy #2: Balance Housing Needs with Neighborhood Conservation

***Policy SCP-H 11*:** Promote location of housing near compatible and neighborhood-serving support uses and facilities, such as child care, shopping, and recreation, and promote inclusion of such neighborhood-serving facilities in housing areas, as appropriate.

***Policy SCP-H 12*:** Plan housing areas and facilities to take maximum advantage of existing and planned transportation services and facilities.

***Policy SCP-H 13*:** Recognize and enhance the character of existing residential areas for faculty/staff and students.

***Policy SCP-H 14*:** Balance concerns about the compatibility of new housing development in existing neighborhoods with the need for increased housing supply and improved affordability.

***Policy SCP-H 15*:** Provide and maintain parks and related facilities in Campus Residential areas (see Open Space Chapter).

***Policy SCP-H 16*:** Balance concerns about the compatibility of new housing development on the campus periphery with existing off-campus neighborhoods with the need for increased housing supply and improved affordability.

***Policy SCP-H 17*:** Balance concerns about the maintenance of buffers between the University and Menlo Park and Palo Alto with the need for increased housing supply and improved affordability (see Open Space Chapter).

2000 General Use Permit

The General Use Permit was most recently adopted in 2000 and is the implementation document that permits additional academic facilities and housing units, and establishes conditions of

approval, consistent with the goals, strategies, and policies of the Stanford Community Plan. See discussion of applicable conditions of the 2000 General Use Permit related to housing under the Existing Environmental Setting, above.

Association of Bay Area Governments

Regional Housing Need Plan

The Regional Housing Need Allocation (RHNA) is the state-mandated process to identify the total number of housing units (by affordability level) that each jurisdiction must accommodate in its Housing Element. As part of this process, the California Department of Housing and Community Development identifies the total housing need for the San Francisco Bay Area for an eight-year period (the current cycle is 2014 to 2022). ABAG must then develop a methodology to distribute this need to local governments. In accordance with SB 375, the RHNA is required to be consistent with the development pattern identified in the long-range integrated transportation and land-use/housing strategy of the Bay Area, known as Plan Bay Area. The Regional Housing Need Plan for 2014 to 2022 was adopted by ABAG on July 18, 2013. The total need identified for Santa Clara County was 58,836 housing units, of which only 277 units were allocated for unincorporated areas of the County. San Mateo County's total need is 16,418 housing units (ABAG, 2013a). The allocation of 277 units is a substantial decrease compared to the 1,090 units allocated for the 2007-2014 period and reflects Plan Bay Area's emphasis on concentrating housing opportunities within incorporated Priority Development Areas (County of Santa Clara, 2014).

The Housing Element of the Santa Clara County General Plan recognizes that Stanford constructed 816 affordable units during the 2000 General Use Permit, including 298 graduate student housing units recognized as affordable to very-low-income individuals and 518 graduate student housing units affordable to low-income individuals. The County credited all of these units toward its RHNA (Stanford, 2016).

5.12.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the proposed Project would have a significant impact on population and housing if it would:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Approach to Analysis

Estimation of Population

In order to estimate the increase in Stanford student, faculty and staff population, Stanford calculated the Compound Annual Growth Rate (CAGR) for each population group using Stanford population data for those population groups from 2000 to 2015. The CAGR was then applied to each population segment to calculate the anticipated populations in 2035. The population growth deviated from the CAGR for three population segments. First, Stanford assumed approximately 100 undergraduate students would be added each year during the 17-year lifetime of the proposed Project, which is higher than the historic growth rate for this population group. Second, half of the historic growth rate for postdoctoral students was applied to this population segment due to trends showing growth for this population group to be levelling off. Lastly, no growth was assumed in the "Other Teaching" component of the faculty population, as this group is estimated to remain steady through 2035.

Table 5.12-7 presents the Stanford students, faculty and staff population change that would occur between 2018 and 2035; the 2035 population includes the increase in population associated with remaining authorized housing (i.e., EV Graduate Residences) that would be developed by 2020 under the 2000 General Use Permit, and population associated with new housing that would be authorized under the proposed 2018 General Use Permit. As shown in Table 5.12-7, Stanford anticipates that it will grow by approximately 7,509 student, faculty, and staff between 2018 and 2035, which reflects an approximate 1.2 percent CAGR. The total Stanford students, faculty and staff population in 2035 is estimated at 39,560.

TABLE 5.12-7
STANFORD STUDENT, FACULTY, AND STAFF POPULATION – 2035

Affiliation	Population 2018	Population 2035	Increase 2018 - 2035	Growth Rate (CAGR)
Undergraduates	7,085	8,785	1,700	1.3%
Graduate Students	9,528	10,728	1,200	0.7%
Postdoctoral Students[a]	2,403	3,364	961	2.0%
Faculty[b]	3,073	3,862	789	1.4%
On-Campus Staff [c]	8,985	11,423	2,438	1.4%
Nonmatriculated Students[d]	977	1,397	420	2.1%
Total	**32,051**	**39,560**	**7,509**	**1.2%**

NOTES:

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

In addition, other worker populations would also contribute to the on-campus population under the 2018 General Use Permit, including casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers. As is currently the case, under the proposed 2018 General Use Permit, many members of these populations would not work on the campus on a daily or year-round basis, or be directly employed by Stanford. Over the duration of the proposed 2018 General Use Permit, the growth rate assumed for the contingent, casual, temporary, and non-employee affiliate population segments would be the same as that for regular benefits-eligible non-academic employees (i.e., staff, at 1.4 percent CAGR). Third-party and janitorial contract workers were estimated to grow at the same rate as occupied academic and academic support square footage (22.1 percent from Fall 2018 to Fall 2035). Construction contract workers would be expected to stay constant, as this has been the trend during the 2000 General Use Permit and construction is expected to continue at historic rates under the proposed 2018 General Use Permit.

Table 5.12-8 presents the other worker populations that would occur between 2018 and 2035. Stanford estimates there would be an increase of 2,101 of the other worker populations at Stanford between 2018 and 2035, which reflects an approximate CAGR of 1.2 percent, for a total of 11,267 other workers. Based on their estimated commute frequency, the total daily population of these other workers would increase by 1,074 workers between 2018 and 2035, for a total Stanford other worker daily population of 6,395.

TABLE 5.12-8
OTHER WORKER POPULATIONS AT STANFORD – 2035

Affiliation	Population 2018	Daily Campus Population 2018	Population 2035	Daily Campus Population 2035	Increase in Campus Population 2018 - 2035	Increase in Daily Campus Population 2018 - 2035
Casual Employees[a]	2,167	434	2,746	550	579	116
Contingent Employees[b]	1,021	531	1,294	673	273	142
Temporary Employees[c]	1,448	1,130	1,835	1,432	387	302
Non-Employee Academic Affiliates, 20 Percent FTE[d]	1,312	224	1,662	283	350	59
Non-Employee Academic Affiliates, FTE[d]	1,435	1,220	1,818	1,546	383	326
Third Party Contract Workers[e]	324	324	396	396	72	72
Janitorial Contract Workers[f]	259	259	316	316	57	57
Construction Contract Workers[g]	1,200	1,200	1,200	1,200	0	0
Total	**9,166**	**5,321**	**11,267**	**6,395**	**2,101**	**1,074**

NOTES:
[a] Casual employees are hourly workers less than 50 percent FTE and working no more than 980 hours per year, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[b] Contingent employees are salaried workers with roles that are comparable to staff, working less than 50 percent full-time equivalent (FTE) and/or working less than six months.
[c] Temporary workers are hourly workers at 50 percent FTE or more working no longer than six months, including summer camp staff, summer grounds/ facilities work, and special projects in academic units.
[d] Other non-employee academic affiliates include affiliated teaching staff, adjunct professors, and visiting scholars. These are not typically full-time positions, with some members of this population visiting the campus only 20 percent of the time
[e] Third party contract workers include food service workers at on-campus cafeterias and child care center workers.
[f] Janitorial contract workers are third party contractors working off-peak hour morning and evening shifts.
[g] Construction contract workers are related to ongoing construction projects on the campus.

SOURCE: Stanford University Land Use and Environmental Planning Office, 2017

Topics with No Impact or Otherwise Not Addressed in this EIR

Population and housing changes, in and of themselves, are not normally considered to be significant impacts (i.e., substantial, adverse impacts on the physical environment) under CEQA, but CEQA does allow inclusion of these effects as indicators of other impacts. More specifically, CEQA Guidelines section 15131 provides that social and economic effects may be considered to the extent that (1) they provide a linked connection between the proposed project and a physical environmental effect, or (2) they are useful in determining the significance of a physical environmental effect. Therefore, this analysis quantifies and describes the magnitude of such potential changes. The potential physical environmental impacts associated with changes in population and housing are analyzed in other sections of this EIR (e.g., transportation, public services, air quality).

Direct increases in employment can create secondary effects, such as an increased demand for housing. This housing demand could be considered a significant effect if the housing demand could not be met with existing or future housing supply within the housing market for future Stanford students, faculty, staff, and other workers, and if the construction of housing could be linked to physical environmental impacts, such as increased air emissions, loss of habitat, or construction noise impacts.

Based on its characteristics, the proposed 2018 General Use Permit was determined to have no potential impact on population and housing significance criteria (b) and (c):

> **Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere –** As under the 2000 General Use Permit, proposed housing development under the proposed 2018 General Use Permit would represent "net new" housing. Existing housing on the campus may be demolished over the course of implementation of the 2018 General Use Permit; however, any demolished housing units would be added to the inventory of new housing units authorized for construction. Therefore, the Project would not displace substantial numbers of existing housing as the overall supply of housing units would increase under the 2018 General Use Permit. No impact would result.
>
> **Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere –** No impact would result for the same reasons described above regarding displacement of existing housing.

Impact Evaluation

Impact 5.12-1: The proposed Project would not directly induce substantial population growth by proposing new homes or businesses, and indirectly through the extension of infrastructure. (*Less than Significant*)

Population Growth

Stanford proposes to grow over the lifetime of the proposed 2018 General Use Permit by expanding academic and academic support space at a growth rate that is consistent with Stanford's historic annual growth rate for such facilities. **Table 5.12-9** provides an overview of the projected

population growth of each Stanford population segment (including students, faculty, staff and other worker populations) that would occur between 2018 and 2035. As shown in Table 5.12-9, the total population is expected to increase from 41,217 in 2018 to 50,827 by 2035. This represents an increase in population of 9,610 individuals. Based on the commute frequency of the population composing the other worker category, the daily increase in population would be 8,583 individuals.

TABLE 5.12-9
ANTICIPATED POPULATION GROWTH IN ALL POPULATION SEGMENTS

Affiliation	2018 Population	2035 Population	Change in Population
Undergraduate Students	7,085	8,785	1,700
Graduate Students, including PhDs	9,528	10,728	1,200
Postdoctoral Students[a]	2,403	3,364	961
Faculty[b]	3,073	3,862	789
On-Campus Staff [c]	8,985	11,423	2,438
Nonmatriculated Students[d]	977	1,397	420
Other Workers (total / daily based on commute frequency)[e]	9,166 / 5,321	11,267 / 6,395	2,101 / 1,074
Total / Daily	**41,217 / 37,372**	**50,827 / 45,955**	**9,610 / 8,583**

NOTES:
[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.
[e] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with Stanford Office of Institutional Research and Decision Support

On-site Housing Demand

As stated in Chapter 3, Project Description, one of the objectives of the proposed 2018 General Use Permit is to accommodate the anticipated increased enrollment and balance academic and academic support space growth with the growth in student housing. Stanford seeks authorization of new and expanded student housing units/beds at a growth rate that is consistent with Stanford's historic annual growth rate for student housing (excluding the unique EV Graduate Residences project, currently under construction pursuant to the 2000 General Use Permit).

The proposed 2018 General Use Permit would allow 3,150 net new housing units/beds, of which up to 550 units would be available for faculty, staff, postdoctoral scholars, and medical residents. Of the approximately 2,600 net new units/beds for undergraduate and graduate students that would be developed under the proposed 2018 General Use Permit, Stanford projects that 1,700 net new undergraduate units/beds and 900 net new graduate units/beds would be added.[3]

[3] This is exclusive of the 2,020 beds associated with the EV Graduate Residences that were authorized under the 2000 General Use Permit that would be developed on the Project site by 2020.

Proposed housing development limits under the 2018 General Use Permit would represent "net new" housing; existing residential units on the campus may be demolished over the course of implementation of the 2018 General Use Permit, and the demolished units would be added to the inventory of new housing units authorized for construction.

All proposed residential development under the proposed 2018 General Use Permit would occur within the Academic Growth Boundary, as shown in Figure 3-8. Proposed new housing is anticipated be focused in the East Campus and Lagunita Development Districts, along with new high-density housing in the Quarry Development District.

Based on current and historic occupancy rates, Stanford estimates that 10 percent of graduate student housing would continue to be occupied by couples (Stanford graduate students plus 2 percent Stanford student spouses and 8 percent non-Stanford student spouses) resulting in 1.1 residents per graduate student bed. Stanford also estimates that on average 2.57 residents would occupy each faculty and staff housing unit.

Table 5.12-10 summarizes the anticipated population that would reside on the Project site (i.e., within the proposed 2018 General Use Permit boundary) in 2018 and 2035; this includes increases in population associated with remaining authorized housing that would be developed on-site by 2020 under the 2000 General Use Permit, and population associated with new housing that would be authorized under the proposed 2018 General Use Permit. The total estimated increase in residential population on the Project site between 2018 and 2035 would be 6,326 people, including students, faculty, staff and associated family members living on-site. Approximately 95 percent of undergraduates would live on the Project site in 2035 and 76 percent of graduate students, if all proposed housing units are constructed.

TABLE 5.12-10
STANFORD POPULATION RESIDING ON PROJECT SITE – 2035

Affiliation	Residential Population Within Project Site Boundary 2018	Residential Population Within Project Site Boundary 2035	Change in Residential Population
Undergraduate Students	6,617	8,317	1,700
Graduate Students	5,205	8,183	2,978
Non Student Spouses	660	894	234
Children	420	420	0
Faculty/Staff/Postdoctoral Students	965	1,515	550
Other Family Members	1,471	2,335	864
Total	**15,338**	**21,664**	**6,326**

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford University Residential and Dining Enterprises

As with the 2000 General Use Permit, under the proposed 2018 General Use Permit the development of academic and academic support space would be linked to the development of housing units. For each 0.5 million square feet of net new academic and academic support space constructed by the Project, 605 new housing units/beds would be required to ensure new housing keeps pace with academic and academic support facility development.[4] Therefore, up to 2,753 new units/beds would be required if the maximum allowable net new square feet of academic and academic support space under the Project is constructed. This represents the minimum housing required per the housing linkage ratio if all academic and academic support space is constructed. As noted above, Stanford proposes a greater number of housing units/beds (3,150) than required by the housing ratio.

Off Site Population and Housing Demand

The proposed Project would not directly increase population or the number of housing units beyond the Project site boundary. However, the growth of Stanford-affiliated population would not be entirely accommodated by housing within the Project site, and therefore would result in an indirect housing demand (and associated population growth) beyond the Project site.

The estimated growth in off-site households resulting from the proposed 2018 General Use Permit would include 83 graduate student households, 449 postdoctoral student households, 1,385 staff households, and 610 households for other workers. Assuming that all new faculty are accommodated in the new faculty/staff units, a net decrease of 102 off-site faculty households is projected under the proposed 2018 General Use Permit. In total, the proposed 2018 General Use Permit is expected to result in demand for 2,425 off-site housing units (Stanford, 2017).

Factors have been applied to convert population to households.[5] Multiple-earner households have two or more workers. The analysis recognizes that if an added employee lives in a household with one or more other workers, that added employee is not responsible for creating demand for an entire additional housing unit, only a portion of that unit. There is no assumption in these household calculations that Stanford workers would live with one another. Rather the assumption is that the Stanford worker, graduate student or postdoctoral student is responsible for the fraction of the household that corresponds to the number of workers per household for the particular affiliate group.

The growth in Stanford student, faculty, staff, and other worker households that would live off-site would be distributed among jurisdictions in the Bay Area. The estimated distribution of these households is based on data from Stanford's 2016 Commute Survey. Approximately 52 percent of the growth in households under the proposed 2018 General Use Permit is estimated to reside in Santa Clara County, including approximately 15 percent in Palo Alto, 12 percent in San Jose, 10 percent in Mountain View, 6 percent in Sunnyvale, and 3 percent in Santa Clara; approximately

4 This is the same housing linkage ratio as identified in Condition F.8 in the 2000 General Use Permit.

5 The household adjustment factors are as follows: for graduate students, 2.54 persons per household based on the 2016 Commute Survey of Stanford's Department of Parking and Transportation Services; for post-doctorate students, 2.16 persons per household based on this same 2016 Commute Survey; for faculty, staff and other worker populations, 1.76 persons per household based on the 2011-2015 American Community Survey data for Santa Clara County. Because many members of the other worker population work only part time at Stanford, the household projections for this category are based on the daily population.

1 percent or less would reside in each of the other jurisdictions within Santa Clara County. Approximately 27 percent of the growth in households under the proposed 2018 General Use Permit is estimated to reside in San Mateo County, with approximately 6 percent in both Menlo Park and Redwood City, 4 percent in unincorporated San Mateo County, 3 percent in San Mateo; and 2 percent in both East Palo Alto and San Carlos; approximately 1 percent or less would reside in each of the other jurisdictions within San Mateo County. About 10 percent would reside in Alameda County and 8 percent in San Francisco. The remaining 3 percent would be spread out amongst the various counties of the nine-county San Francisco Bay Area (Stanford, 2017).

As shown on **Table 5.12-11**, the housing increases within each of these jurisdictions would represent a small fraction of the household growth projected for each jurisdiction by ABAG for the 2015-2040 timeframe.

TABLE 5.12-11
OFF-CAMPUS HOUSEHOLD INCREASE DURING 2018 GENERAL USE PERMIT PERIOD RELATIVE TO PROJECTED GROWTH IN BAY AREA JURISDICTIONS, 2015-2040

Jurisdiction	Projected Household Increase Resulting from 2018 General Use Permit	Projected Household Growth	Project Proportion of Growth
Total Santa Clara County	**1,271**	**179,240**	**0.7%**
Campbell	21	2,740	0.8%
Cupertino	26	3,230	0.8%
Gilroy	5	2,400	0.2%
Los Altos	31	920	3.4%
Los Altos Hills	8	150	5.3%
Los Gatos	10	770	1.3%
Milpitas	24	10,450	0.2%
Monte Sereno	0	80	0.0%
Morgan Hill	8	3,200	0.3%
Mountain View	244	8,230	3.0%
Palo Alto	367	6,590	5.6%
San Jose	279	109,260	0.3%
Santa Clara	74	11,910	0.6%
Saratoga	6	570	1.1%
Sunnyvale	152	16,240	0.9%
Unincorporated County	17	2,500	0.7%
Total San Mateo County	**655**	**47,950**	**1.4%**
Atherton	11	210	5.2%
Belmont	26	1,020	2.5%
Brisbane	0	230	0.0%
Burlingame	20	3,190	0.6%
Colma	1	210	0.5%
Daly City	15	3,910	0.4%
East Palo Alto	41	1,170	3.5%

TABLE 5.12-11 (CONTINUED)
OFF-CAMPUS HOUSEHOLD INCREASE DURING 2018 GENERAL USE PERMIT PERIOD RELATIVE TO PROJECTED GROWTH IN BAY AREA JURISDICTIONS, 2015-2040

Jurisdiction	Projected Household Increase Resulting from 2018 General Use Permit	Projected Household Growth	Project Proportion of Growth
Foster City	11	780	1.4%
Half Moon Bay	3	260	1.2%
Hillsborough	1	260	0.4%
Menlo Park	153	1,820	8.4%
Millbrae	11	2,550	0.4%
Pacifica	12	570	2.1%
Portola Valley	1	130	0.8%
Redwood City	133	7,450	1.8%
San Bruno	11	3,740	0.3%
San Carlos	37	1,560	2.4%
San Mateo	66	8,690	0.8%
South San Francisco	10	5,820	0.2%
Woodside	9	90	10.0%
Unincorporated San Mateo County	84	4,290	2.0%
Total Alameda County	**240**	**133,960**	**0.2%**
Alameda	6	5,390	0.1%
Albany	2	1,120	0.2%
Berkeley	9	8,320	0.1%
Dublin	2	7,270	0.0%
Emeryville	1	4,960	0.0%
Fremont	80	15,120	0.5%
Hayward	23	11,280	0.2%
Livermore	5	8,200	0.1%
Newark	29	3,070	0.9%
Oakland	32	49,070	0.1%
Piedmont	1	70	1.4%
Pleasanton	6	5,900	0.1%
San Leandro	8	6,420	0.1%
Union City	26	2,690	1.0%
Unincorporated County	11	5,080	0.2%
Contra Costa County	**16**	**76,280**	**0.0%**
Marin County	**4**	**7,400**	**0.1%**
San Francisco County	**199**	**84,910**	**0.2%**
All Other Jurisdictions[a]	**41**	**N/A**	**N/A**

[a] All Other Jurisdictions include Monterey County, San Joaquin County, Santa Cruz County, and all other locations where growth in off-campus households is projected. These jurisdictions are not described separately in the table because they are outside the ABAG planning region analyzed in *Projections 2013* and because the number of projected households in these jurisdictions is small.

SOURCE: Stanford, 2017

In order to help address off-site housing demand generated by the Project, as part of the proposed Project, Stanford proposes to continue its contributions to the County-administered Stanford Affordable Housing Fund, as was required under 2000 General Use Permit Condition F.6. Under the current 2000 General Use Permit, for each 11,763 square feet of academic development built pursuant to the proposed 2018 General Use Permit, Stanford shall either provide one affordable housing unit on the Stanford campus, or make a cash payment in-lieu of providing the housing unit. The in-lieu payments established in Condition F.6 were required to fund affordable housing projects within a 6-mile radius of the boundary of the Stanford campus. Stanford proposes a modification to the location of affordable housing projects that would be funded by in-lieu payments. Instead, payments made under the proposed 2018 General Use Permit would support development of affordable housing within one-half mile of a major transit stop or a high-quality transit corridor, as defined by SB 375, which would further statewide goals for reducing vehicle miles traveled and greenhouse gas emissions.

Stanford proposes to continue its contributions similar to the current rate of $20/academic gross square foot, subject to an annual increase to account for inflation. In November 2015, the County Board of Supervisors, as part of the Silicon Valley/Alameda County Nexus Study Project, approved an agreement with the Silicon Valley Community Foundation to complete an affordable housing nexus study for new development within unincorporated Santa Clara County. The Nexus Study was completed in December 2016. It did not analyze affordable housing impacts from residential and non-residential development at Stanford. On June 20, 2017, the Board directed County staff to extend the county-wide Nexus Study to include residential and non-residential development on the Stanford campus. The results of the expanded study are anticipated in late-2017 (County of Santa Clara, 2017).

In addition, Stanford anticipates that the 900 net new graduate student units/beds proposed under the proposed 2018 General Use Permit would equate to approximately 450 affordable housing units that would be credited by the County towards its Regional Housing Needs Allocation.

Removal of Infrastructure Limitations

The proposed 2018 General Use Permit would accommodate construction of campus infrastructure improvements to support proposed growth, including, but not limited to, utilities and circulation improvements such as pathways, underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, and other similar types of improvements. Although most infrastructure subject to the proposed 2018 General Use Permit would be constructed on vacant land, infill sites, and redevelopment sites within the Academic Growth Boundary, some improvements could occur outside the Academic Growth Boundary.

Development under the proposed 2018 General Use Permit would include infrastructure improvements designed to accommodate Stanford's growth through 2035. The scale and nature of these improvements are likely to be limited to the growth directly attributable to the proposed 2018 General Use Permit. Moreover, the proposed 2018 General Use Permit would not modify the Academic Growth Boundary, and development under the Project would be directed to areas that are already urbanized. Proposed infrastructure development would not be designed to induce substantial population growth outside the Academic Growth Boundary.

Summary

Stanford's growth over the lifetime of the proposed 2018 General Use Permit is consistent with the Stanford's historic annual growth rate for academic and academic support facilities. The projected increase of 7,509 students, faculty, and staff is similarly based on historic data. Under the proposed 2018 General Use Permit, Stanford would be required to construct 2,753 housing units commensurate with 500,000 square feet of academic development, but would be allowed to provide up to 3,150 net new housing units/beds, including housing on the Project site for all new undergraduate students and approximately 75 percent of graduate students.

Under the proposed 2018 General Use Permit, as under the 2000 General Use Permit, the growth of Stanford-affiliated populations would result in population growth and associated demand for housing in many Bay Area jurisdictions. Approximately 2,425 off-campus housing units are expected to be required to house the population growth resulting from full buildout of the proposed 2018 General Use Permit. The housing increases anticipated to occur within each jurisdiction in which Stanford students and employees live would represent a small fraction of the household growth projected for each jurisdiction by ABAG for the 2015-2040 timeframe. In order to assist in local efforts to accommodate housing demand in nearby communities, under the Project, Stanford would continue its contributions to the County-administered Stanford Affordable Housing Fund.

Stanford's on-site housing program, including its linkage with academic space growth, and its commitment to continued support for off-campus affordable housing, would reduce the potential negative effects of population growth attributable to the proposed 2018 General Use Permit to a less than significant level. Indirect effects of infrastructure expansion would not induce substantial population growth, resulting in a less than significant impact.

Mitigation: None required.

Cumulative Impacts

The proposed 2018 General Use Permit was determined to have no potential impact on population and housing criterion (b) or (c). Because a cumulative impact is only relevant when considered in the context of an adverse effect of the Project, there is no basis for consideration of cumulative effects related to those impacts. Thus, the cumulative discussion below focuses on cumulative effects related to Impact 5.12-1, above.

Impact 5.12-2: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative population and housing impacts. (*Less than Significant*)

The geographic scope of potential population and housing impacts encompasses the Stanford lands within the proposed 2018 General Use Permit boundary as well as Bay Area communities that could be affected by population growth resulting from the Project. As discussed in the Environmental Setting, the lack of both market-rate and affordable housing for the Bay Area's

rising population will continue to be problematic for the entire Bay Area for the foreseeable future. Stanford's contribution to this cumulative population and housing impact is discussed below.

The total estimated direct increase in residential population within the Project site between 2018 and 2035 would be 6,326 people in 2035, or an average of about 370 people per year between 2018 and 2035. This direct population growth would represent less than two percent of the projected population growth of approximately 365,320 people in Santa Clara County between 2017 and 2035 (CDF, 2017; ABAG, 2013b). As this population would be housed entirely within the Project site, the increase in population would not combine with non-Stanford population growth in Santa Clara County and contribute to the existing significant demand for housing in the Bay Area. The impact would therefore be less than significant.

As shown in Table 5.12-11, the proposed 2018 General Use Permit is expected to result in the demand for 2,425 off-site housing units by 2035, which would be distributed among jurisdictions in the Bay Area. Within Santa Clara County, the largest distribution of these households is anticipated to occur in Palo Alto (approximately 367 new households), San Jose (279 new households), Mountain View (244 new households), and Sunnyvale (152 new households). In San Mateo County, the largest distribution of these households would occur in Menlo Park (153 new households) and Redwood City (133 new households). The remaining 1,097 households would be distributed among other jurisdictions in these and other counties in the Bay Area (Stanford, 2017). While the construction of new housing units for the estimated 2,425 new households would contribute to typical environmental impacts associated with housing development described in the Environmental Setting, the cumulative contribution of such impacts resulting from the proposed Project would not be considerable in light of the estimated 467,920 new households expected in the Bay Area between 2015 and 2035 (ABAG, 2013b). Stanford's commitment to funding off-campus affordable housing development described under Impact 5.12-1 would further assist in accommodating regional demand. Stanford's contribution to the Bay Area's cumulative housing impact would not be considerable. The impact would be less than significant.

Mitigation: None required.

5.12.6 References

Association of Bay Area Governments (ABAG); Regional Housing Need Plan, San Francisco Bay Area: 2014-2022, adopted July 18, 2013a.

ABAG; *Plan Bay Area, Projections 2013*, December 2013b.

ABAG and Metropolitan Transportation Commission (MTC), *Draft Plan Bay Area, Final Forecast of Jobs, Population and Housing*, July 2013.

ABAG/MTC; *Plan Bay Area 2040, Draft Supplemental Report, Regional Forecast of Jobs, Population and Housing*, March 2017a.

ABAG/MTC; *Plan Bay Area 2040, Final Plan*, Adopted July 26, 2017b.

California Department of Finance (CDF); *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change – January 1, 2016 and 2017*, May 2017.

City of Palo Alto; *Comprehensive Plan Update: Population, Housing, and Employment, Draft Existing Conditions Report*, August 29, 2014.

City of Palo Alto; *Comprehensive Plan Update, Supplement to the Draft EIR*, February 10, 2017.

County of Santa Clara; *General Plan*, adopted December 20, 1994.

County of Santa Clara; *Housing Element Update 2015-2022*, adopted June 10, 2014.

County of Santa Clara; *Stanford Community Plan*, adopted December 2000.

County of Santa Clara; Department of Planning and Development, Report No. 87322, Consider recommendations relating to the Silicon Valley/Alameda County Nexus Study Project, approved June 20, 2017.

County of Santa Clara, Planning Office; *Stanford University General Use Permit*, adopted December 2000, revised November 26, 2013, and May 5, 2015.

Metropolitan Transportation Commission (MTC); Vital Signs, www.vitalsigns.mtc.ca.gov/.

Stanford University; *2018 General Use Permit Application*, submitted to the County of Santa Clara November 21, 2016, as amended.

Stanford University; *2018 General Use Permit Application*, Technical Data to Address Population and Associated Housing Demand, July 25, 2017.

United States Census Bureau; 2011-2015 American Community Survey 5-Year Estimates.

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5.13 Public Services

5.13.1 Introduction

This section evaluates potential environmental effects resulting from implementation of the proposed 2018 General Use Permit on public services, including fire protection and emergency medical services, police protection, public schools and libraries. The section includes a description of the existing and 2018 baseline environmental settings, criteria used to determine impact significance, a discussion of potential impacts to public services; and regulatory mechanisms and/or feasible mitigation measures, as necessary, to reduce potential impacts.

The section relies in part on a Background Conditions Report (see Appendix BCR) prepared by Stanford, and independently peer reviewed by ESA, in support of the 2018 General Use Permit application; as well as public service-related reports available from the City of Palo Alto with regard to fire protection and emergency services and police protection; the Palo Alto Unified School District, and Stanford.

Please see also Section 5.14, Recreation, which addresses potential Project effects on public parks, recreation facilities and open spaces.

5.13.2 Existing Environmental Setting

Students, faculty, and staff at Stanford are served by both on- and off-campus public services, including, fire protection and emergency medical services, police protection, schools and libraries. As such, this subsection considers both existing on- and off-campus public services that may be utilized or affected by the proposed Project due to either their intended use or proximity to the campus.

Fire Protection and Emergency Services

Palo Alto Fire Department (PAFD)

The PAFD provides fire protection and suppression, and emergency medical service (EMS), for all areas within the jurisdictional boundaries of Palo Alto in addition to some of the unincorporated land surrounding the city limits, including the Project site. EMS is the primary service the PAFD provides to Palo Alto and Stanford. The PAFD is the only fire department in the County that provides ambulance and transport services. All responding fire engine and ambulances to emergency calls include paramedics (City of Palo Alto, 2017a).

In addition to its primary service area, the City of Palo Alto maintains mutual aid and automatic aid agreements with the City of Menlo Park, the California Department of Forestry and Fire Protection (CAL FIRE), the Santa Clara County Central County Fire Department (CCFD), the

City of Mountain View, and the Woodside Fire Protection District in San Mateo County (Local Agency Formation Commission (LAFCO) of Santa Clara County, 2010).[1]

In 1976, the City of Palo Alto and Stanford signed an agreement for the PAFD to provide EMS, fire protection and rescue services for the Project site. This agreement will terminate in 2026. The agreement specifies that the PAFD occupy and operate Stanford Fire Station (Station 6), located at 711 Serra Street in the northeastern portion of the Academic Growth Boundary within the Project site. The agreement, and subsequent amendments, also establish that Stanford's fair share be reimbursed to the City of Palo Alto for fire protection services.[2] The City of Palo Alto assesses fire protection needs through its annual budget, and as part of this process, the City identifies Stanford's share and Stanford pays its annual allotment.

The PAFD currently maintains six full-time fire stations (Stations 1 through 5; and the aforementioned Station 6 on the Stanford campus), and one seasonal fire station (Station 8, located on Page Mill Road south of the Project site) which is operated during the summer months.

The PAFD maintained 96 full-time equivalent (FTE) personnel in the first quarter of fiscal year (FY) 2017. This includes three battalions of crews for its six full-time fire stations (City of Palo Alto 2017a). At its fire stations, the PAFD maintains the following apparatus:

- one Pierce Tiller aerial ladder truck;
- six Pierce Arrow XT fire engines (one at each full-time station);
- one ladder truck (at Station 6) designed for ventilation on fires, technical rescues and vehicle rescue response;
- two advanced life support ambulances (at Stations 1 and 2) that respond to all medical incidences, and are also included in fire, rescue, and vehicle accidents and hazardous materials incidents, and one cross-staffed ambulance (at Station 4) that responds to medical incidents when the ambulances from Stations 1 and 2 are not available (City of Palo Alto, 2015).

In FY 2016, PAFD received 8,882 calls for service, including 5,356 medical and rescue calls, 150 calls related to fires, and 3,376 other calls for service. There were a total of 3,842 ambulance transports in FY 2016. Accordingly, building firefighting is a small share of the department's overall efforts, with EMS, educational outreach, and technical rescue the PAFD's main focus areas.

The City of Palo Alto has set its service goals based on the percent of calls that are responded to under a specified response time as opposed to a staffing ratio. Goal 1 for the PAFD in the City of Palo Alto Fiscal Year 2018 Proposed Budget states "Arrive at the scene of emergencies safely and in a timely manner within the Department's targeted response time." Currently, these time

[1] Mutual aid and automatic aid agreements call for the department with crews closest to the incident to respond to the call, and to provide assistance before, during, and after an emergency event in order to facilitate the rapid mobilization of personnel, equipment, and supplies.

[2] Until 2013, the agreement also provided coverage through a fire station at the SLAC National Accelerator Laboratory in unincorporated San Mateo County, however, that station has since been closed and fire protection service for that land is now provided under a contract with the Menlo Park Fire Protection District.

goals include responding to 90 percent of fire emergencies and emergency medical requests for service within eight minutes, and responding to 90 percent of paramedic (advanced life support) calls for service within 12 minutes. In FY 2016, PAFD arrived at 89 percent of fire emergencies within eight minutes, 92 percent of EMS calls within eight minutes, and placed a paramedic at EMS calls within 12 minutes, 99 percent of the time. The PAFD indicates that while it fell just short of meeting its goal in responding to fire emergencies in FY 2016, this was the closest they have come to meeting the goal in many years. Using the results from its Community Focused Integrated Risk Management Assessment, the PAFD launched an Operational Readiness Initiative aiming at reducing response times (City of Palo Alto, 2017b).

Stanford University Fire Marshal's Office (SUFMO)

The campus is subject to numerous codes and standards which regulate the design, construction, and use of buildings with the intent of preventing fires and protecting life and property. The SUFMO oversees fire and life safety code compliance for the Project site and provides fire protection engineering, education, maintenance and inspection services. The Stanford Fire Marshal's Office is located at the Environmental Safety Facility (ESF) at 480 Oak Road. The SUFMO has three primary goals: (1) ensure a high level of fire protection on campus, (2) comply with all fire codes, and (3) work strategically with external agencies to achieve equitable interpretation and application of codes to minimize undue constraints on operational efficiency (Stanford University, 2016a).

Please see also a description of existing emergency response planning, and response to hazardous material incidents and wildland fires in Section 5.8, Hazards and Hazardous Materials.

Police Protection Services

Stanford Department of Public Safety (DPS)

Police protection for the Project site is provided by the DPS under the authority of the County of Santa Clara Sheriff's Department. The Stanford DPS provides a variety of services, including law enforcement, crime prevention, emergency response, and traffic and parking control. A Memorandum of Understanding (MOU) regarding police services between the County of Santa Clara and Stanford provides for sworn Stanford Deputy Sheriffs to have full law enforcement powers to make arrests and enforce State laws and county ordinances. The MOU does not contain an expiration date (Stanford and County of Santa Clara, 2007; Stanford University, 2016).

All initial and follow-up investigations of crimes occurring on the Project site are conducted by Stanford DPS Deputies, except for cases involving a death, attempted homicide and kidnapping and/or taking of hostages, which are managed by the Santa Clara County Sheriff's Office. The County Sheriff or its designee may also elect to take full responsibility for investigating any criminal incident that occurs on campus. Any arrests or prosecution efforts stemming from incidents that occur on the Project site are submitted by Stanford DPS to the Office of the Santa Clara County District Attorney, which possesses the legal authority to prosecute violations of the law (Stanford University, 2016).

The Stanford DPS primary administrative functions are currently housed in the Fire and Police facility at 711 Serra Street on the Stanford campus. (See also description of planned new facility to house Stanford DPS services under 2018 Environmental Baseline, below). Currently, the Stanford DPS has 33 staff, including sworn officers, and non-sworn staff, such as for community service and traffic and parking control. When Stanford DPS has temporary needs for additional police support (e.g., large events) it contracts with private security companies that provide additional off-duty officers. The Stanford DPS uses a variety of factors, including call volumes and population, to determine the adequacy of its staffing levels (Stanford University, 2017).

Santa Clara County Sheriff's Office

The Santa Clara County Sheriff's Office provides police protection services to all unincorporated areas of Santa Clara County, including the Project site (in conjunction with Stanford DPS) as discussed above, as well as the City of Saratoga, Town of Los Altos Hills, and the community of Moffett Field. The Santa Clara County Sheriff's Office has approximately 1,300 sworn law enforcement officers and over 200 non-sworn staff. The Sheriff's Office is divided into four major bureaus, consisting of Field Operations, Support Services, Jail Operations and Administrative Services (County of Santa Clara Sheriff's Office, 2017).

City of Palo Alto Police Department (PAPD)

The PAPD provides police protection service to the City of Palo, including Stanford-owned lands adjacent to the Project site within the Palo Alto city limits (e.g., Stanford Shopping Center and Medical Center). The PAPD operates at the City's Public Safety Building (PSB) at 275 Forest Avenue. In FY 2016, there were 158 full-time equivalent (FTE) positions, including sworn and non-sworn personnel (City of Palo Alto, 2017b). In Palo Alto, the PAPD funds 29 crossing guards for the City on school commute routes.

The PAPD also operates a Communications Center that handles dispatching for the PAPD, PAFD, the City of Palo Alto Utilities and Public Works departments, and for the Stanford DPS. Stanford pays the City of Palo Alto a fair share contribution annually for the communication and dispatch services it receives from the PAPD. In FY 2016, the City of Palo Alto maintained approximately 21 FTE dispatching positions. In FY 2016, the Communication Center received 53,870 calls for service (City of Palo Alto, 2017b).

As a metric of performance, the City maintains a goal to respond to 90 percent of "urgent" calls within 10 minutes and to respond to 90 percent of "emergency" calls within six minutes. In FY 2016, the department responded to urgent calls within 10 minutes 74 percent of the time, and to emergency calls 63 percent of the time (City of Palo Alto, 2017b).

The PAPD is currently planning a new PSB at 250 Sherman Avenue to accommodate the current and future needs of the City. The new PSB will house the PAPD, as well as its emergency dispatch center, and the City's Emergency Operations Center, Office of Emergency Services, and the administration needs of the PAFD. The new PSB is anticipated to be operational in 2021.

Public Schools

Palo Alto Unified School District (PAUSD)

The PAUSD service area covers the Palo Alto, portions of the town of Los Altos and Portola Valley, and the Project site. PAUSD operates 13 elementary schools (grades K-5), three middle schools (grades 6-8), and two high schools (grades 9-12) as shown in **Table 5.13-1**, below. The nearest PAUSD elementary and high schools to the Project site are: Escondido Elementary School, Lucille M. Nixon Elementary School, and Palo Alto High School. In addition, the PAUSD currently operates a pre-school, a Young Fives program, a self-supporting Adult School, the Hospital School at Stanford's Lucile Packard Children's Hospital, and Summer School.

TABLE 5.13-1
2016 / 17 PAUSD CAPACITY AND ENROLLMENT

Schools	2016/17 Enrollment	Capacity[a]
Elementary		
Addison	437	405
Barron Park	285	380
Juana Briones	319	392
Duveneck	442	595
El Carmelo	359	370
Escondido	535	595
Fairmeadow	496	572
Herbert Hoover	392	405
Lucille Nixon	457	460
Ohlone	576	617
Palo Verde	389	360
Walter Hays	428	560
Greendell	99	101
Total	**5,214**	**5,521[b]**
Middle Schools		
David Starr Jordan	1,176	1,100
Jane Lathrop Stanford	1,203	1,100
Terman	715	750
Total	**3,094**	**2,950**
High School		
Gunn	1,919	2,200
Palo Alto	1,992	2,300
Total	**3,911**	**4,500**
District-wide Total	**12,219**	**13,777**

NOTES:
[a] PAUSD indicates the following:
- The school capacities are interim projections, pending results of its in-progress 2018 Facilities Master Plan.
- The school capacities include rooms planned to be built out with current bond funds.
- The individual elementary school capacities assume all elementary classrooms are fully loaded.

[b] PAUSD indicates that utilizing all PAUSD building space would require numbers of elementary school children to be transferred from their neighborhood school to fill vacant classroom space in other PAUSD schools. Consequently, PAUSD discounted the total of the individual school capacities by 5 percent to estimate the total elementary school capacity.

SOURCE: California Department of Education, 2018; and PAUSD, 2017

As shown in Table 5.13-1, during the 2016/17 school year, PAUSD elementary schools had 5,214 students in attendance and a capacity of approximately 5,521 students, PAUSD middle schools had 3,094 students in attendance and a capacity of approximately 2,950 students, and PAUSD high schools had 3,911 students in attendance and a capacity of approximately 4,500 students (California Department of Education [DOE], 2017; and PAUSD, 2017).

PAUSD enrollment forecasts through its planning horizon of 2026/27 school year under its moderate projection scenario are presented in **Table 5.13-2**, below. As shown in Table 5.13-2, PAUSD estimates a decline in its elementary and middle school student enrollment between 2016/17 and the 2026/27 school years (-18 and -26 percent, respectively). The PAUSD also estimates a near-term increase in its high school student enrollment, peaking in 2020/21, but declining thereafter through 2026/27 (for a total net change of -7 percent) (PAUSD, 2016a,b,c).

TABLE 5.13-2
ESTIMATED PAUSD ENROLLMENT FORECASTS – MODERATE PROJECTION: 2016/17 THROUGH 2026/27 SCHOOL YEARS[a,b]

School Year											Percent Change 16/17 to 26/27
16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	
PAUSD Elementary Schools											
5,138	4,976	4,831	4,643	4,482	4,349	4,273	4,232	4,218	4,221	4,211	-18%
PAUSD Middle Schools											
3,073	3,071	3,045	2,893	2,793	2,690	2,591	2,498	2,291	2,312	2,274	-26%
PAUSD High Schools											
3,848	4,037	4,197	4,326	4,380	4,338	4,228	4,024	3,884	3,729	3,593	-7%
Total											
12,059	**12,084**	**12,073**	**11,872**	**11,655**	**11,377**	**11,092**	**10,754**	**10,493**	**10,262**	**10,078**	**-16%**

NOTES:
[a] PAUSD 2016/17 enrollment estimates in this table slightly different than the DOE estimates presented in Table 5.13-1.
[b] PAUSD moderate projection scenario presented; under PAUSD's conservative projection scenario, enrollment would be lower.

SOURCE: PAUSD, 2016a,b,c

Public Libraries

The City of Palo Alto's public library system is comprised of five libraries: Rinconada, Children's, Downtown, College Terrace and Mitchell Park.

Stanford also provides extensive library services, comprising 25 libraries and archives to serve its students' needs. These include Green Library, the largest library on campus, which houses Stanford's Information Center, Media & Microtext Center, the David Rumsey Map Center, and many other central library resources; as well as the Lathrop Library, the East Asia Library and Tech Lounge, which offers a wide array of technological resources and computing spaces; and about a dozen branch libraries that specialize in specific subjects: biology, art, music, engineering, and many more (Stanford, 2016).

5.13.3 2018 Baseline Environmental Setting

As stated in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development and housing authorized under the 2000 General Use Permit would be built and occupied at the time of approval of the 2018 General Use Permit with the exception of the Escondido Village (EV) Graduate Residences. This includes a new approximate 30,000 square foot Public Safety Building and Departmental Operations Center that will be constructed in the Bonair Corporation Yard, to which existing DPS operations will relocate. The EV Graduate Residences, which are currently under construction, would not be completed and occupied until 2020.

The expected incremental increase in on-campus residential population (from an approximate 14,900 under the existing setting to approximately 15,340 by Fall 2018, an increase nearly 440 persons) would result in a proportional increase in demand for public services. Apart from these changes, the conditions described in the existing environmental setting as it relates to on-site public service facilities and demand for public services, are also largely representative for the 2018 environmental baseline.

The City of Palo Alto is currently planning improvements to Fire Station 1 in 2017 and 2018, and is currently replacing Fire Station 3, anticipated to be completed in late 2018 to early 2019 (Nickel, 2017). Apart from these facility improvements, the conditions described in the existing environmental setting for these off-site fire and police protection public services are also largely representative for the 2018 environmental baseline.

With respect to public schools, as shown in Table 5.13-2, under its moderate projection scenario, the PAUSD estimates a decline in its elementary and middle school student enrollment (-6 percent and -1 percent, respectively) between 2016/17 and the 2018/19 school years, and estimates an increase in its high school student enrollment (+9 percent) between 2016/17 and the 2018/19 school years (PAUSD, 2016a,b,c). Apart from the changes in enrollment, the conditions described in the existing environmental setting for public schools are also largely representative for the 2018 environmental baseline.

5.13.4 Regulatory Setting

This subsection briefly describes policies pertaining to public services and recreation as they apply to the proposed Project.

Federal

There are no relevant federal regulations regarding public services applicable to the proposed Project. State and County of Santa Clara regulations are described below.

State

California Master Mutual Aid Agreement

The California Master Mutual Aid Agreement is a framework agreement between the State of California and local governments for aid and assistance by the interchange of services, facilities, and equipment, including but not limited to fire, police, medical and health, communication, and transportation services and facilities to cope with the problems of emergency rescue, relief, evacuation, rehabilitation, and reconstruction.

California Division of Occupational Safety and Health (Cal/OSHA)

In accordance with the California Code of Regulations, Title 8, Sections 1270 ("Fire Prevention") and 6773 ("Fire Protection and Fire Equipment"), the Cal/OSHA has established minimum standards for fire suppression and EMS. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, requirements for the sizing of fire hoses, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

California Fire Code (CFC)

The CFC is found within Chapter 9 of the CCR Title 24. It is created by the California Building Standards Commission, and based on the International Fire Code (IFC), and contained within the California Building Code (CBC). The 2016 CFC became effective January 1, 2017. The CFC establishes the minimum requirements to safeguard the public health, safety and general welfare from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises, and to provide safety and assistance to fire fighters and emergency responders during emergency operations.

California Health and Safety Code (HSC)

State fire regulations are set forth in Sections 13000 et seq. of the California HSC, which includes regulations for building standards (as set forth in the CBC), fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, childcare facility standards, and fire suppression training.

Essential Services Building Act

The Essential Services Building Act of 1986, found in Chapter 2, Section 16000 of the California Health and Safety Code, applies to fire stations, police stations and other public facilities that respond to emergencies. It is intended to ensure that essential services buildings are capable of providing essential services to the public after a disaster, are designed and constructed to minimize fire hazards and are capable of resisting, insofar as practical, the forces generated by earthquakes, gravity, and winds. In addition, nonstructural components vital to the operation of essential services buildings must be able to resist, insofar as practical, the forces created by earthquakes, gravity, fire, and wind.

Leroy F. Greene School Facilities Act of 1998 - Senate Bill 50 (SB 50)

The California Legislature passed SB 50 in 1998, which authorized school districts to impose fees on developers of new residential, commercial, and industrial construction to offset impacts of increased school capacities. SB 50 was codified in California Government Code sections 65995.5 through 65997.

Pursuant to Government Code sections 65995.5 through 65995.7, school districts may collect fees to offset the costs associated with increasing school capacity as a result of development. Three levels of development fees may be levied upon new construction. Level 1 fees are the maximum amount of fees that can be imposed on new development as set by the State Allocation Board. In general, Level 2 and Level 3 fees apply to new residential construction only. Both Level 2 and Level 3 funds only may be levied if the school districts have conducted and adopted a school facility needs analysis. Specifically, Government Code 65997 establishes a State preemption of school mitigation. Under the terms of this statute, payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with a development project. Government Code 65997(b) restricts the ability of local agencies to deny project approvals on the basis that public school facilities (e.g., classrooms and auditoriums) are inadequate.

The PAUSD collects school impact fees on new residential and commercial development within the PAUSD's boundaries, including that developed by Stanford. Prior to issuance of a building permit for a development at Stanford, the County requires that Stanford submits the appropriate school impact fees to PAUSD, and that PAUSD has confirmed receipt of payment.

County of Santa Clara

County Review of Specific Projects

The County requires Stanford to apply project-level approvals for individual projects under Stanford's General Use Permit. As part of this approval process, building plans are reviewed by the County's Building Inspection Office and Fire Marshal's Office for compliance with applicable building and fire codes, and adequate emergency vehicle access.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan and serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County.

The Health and Safety Chapter of the Stanford Community Plan contains several strategies and policies relevant to public services. This chapter includes policies that are intended to minimize potential human or environmental injury and property damage. The Stanford Community Plan addresses public schools in the Land Use Chapter by established a public school land use designation. These strategies, implementation strategies and polices include:

Emergency Preparedness and Response

Strategy #7: Adequate Plan for Risk Reduction, Immediate Disaster Response and Post-Disaster Recovery

SCP-HS 17 – Stanford shall prepare and maintain effective and feasible emergency plans for disaster response and recovery.

SCP-HS 18 – Consider emergency prevention and ability for emergency response in review of development projects on the campus with regard to access, seismic risks, flooding, fire, and other emergency issues.

SCP-HS 19 – Stanford shall promote coordination at the neighborhood level and within campus student housing areas to achieve improved earthquake or other disaster preparedness and response capabilities.

Law Enforcement

SCP-HS 24 – The Stanford University Department of Public Safety shall be permitted to undertake law enforcement activities on unincorporated Stanford lands if it enters into an agreement with the County Office of the Sheriff setting forth the terms and conditions under which the Stanford University Department of Public Safety will be authorized to undertake law enforcement activities.

Implementation Recommendation:

SCP-HS (i)19 – The County Office of the Sheriff and Stanford will develop and maintain an agreement setting forth the conditions under which the Stanford University Department of Public Safety is authorized to undertake law enforcement activities on campus. The issues addressed in the agreement shall include, but not be limited to, adequate qualifications and training of Stanford University Department of Public Safety personnel, appropriate reporting relationships between the Stanford University Department of Public Safety and the Sheriff, complete and timely submission of law enforcement information to the Sheriff, and compliance with legal requirements regarding public access to law enforcement information.

Schools

The Stanford Community Plan designates two existing school sites owned by the PAUSD as Public School (see Figure 3-8 in Chapter3, Project Description), occupied by Lucille M. Nixon Elementary School and Escondido Elementary School. Stanford Community Plan development policies for this land use are as follows:

SCP-LU 20 – Stanford and the appropriate school district shall make every effort to develop school sites in an efficient manner consistent with the environmental setting of the site.

SCP-LU 21 – Stanford and each school district shall seek and promote opportunities for cooperative use of facilities, as appropriate.

SCP-LU 22 – If Stanford land used for a public school is no longer required for school use at any time in the future, it may be converted to another use by the University if re-designated for the intended use through the General Plan amendment process.

City of Palo Alto

City of Palo Alto Comprehensive Plan

The City of Palo Comprehensive Plan's Community Services and Facilities Element addresses the City's public services goals and policies:

Goal C-1: Effective and Efficient Delivery of Community Services.

Policy C-2: Where economies of scale are possible, cooperate with neighboring communities in providing municipal services such as police and fire protection, libraries, and recreation.

5.13.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on public services if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:
  - Fire protection;
  - Police protection; or
  - Schools; or
  - Other public facilities.

Approach to Analysis

The potential for public service impacts as a result of implementation of the proposed 2018 General Use Permit were determined in part by a review of the existing conditions and estimated baseline conditions, including information provided in the background reports and recent publications by the City of Palo Alto, the PAFD, the PAUSD, Santa Clara County Sheriff's Office, and Stanford to describe the existing services at the Project site; and on the construction and operational characteristics of the 2018 General Use Permit. Additionally, case law established by the California courts has influenced the criteria for Project analysis as described further below.

Since the 2000 General Use Permit was approved, the California courts have clarified the standard for assessing an impact on emergency response times and fire protection services and the duty to mitigate such impacts under CEQA. In 2015, a California Court of Appeal held that a population increase caused by a project that would result in delayed emergency response times is not an environmental impact that must be mitigated under CEQA; rather, an environmental impact occurs only if such an effect results in the need for construction of new or expanded

physical facilities and construction of such facilities will in turn result in a significant adverse environmental impact.[3]

Additionally, the courts have long held that classroom overcrowding is not an environmental impact. Rather, there must be physical changes that result from the overcrowding such as construction of new or expanded school facilities.[4] Further, in 1998 with the passage of SB 50 the California State Legislature substantially limited the application of CEQA to school facilities impacts. By statute, the school impact fee set forth in California Government Code section 65996 constitutes the exclusive means of both "considering" and "mitigating" school facility impacts of projects.

Accordingly, this analysis considers the potential for alteration and demolition of existing buildings, as well as new construction under the proposed 2018 General Use Permit, to generate a public service impact. It also examines the potential for new or expanded uses operating over the course of the proposed 2018 General Use Permit timeframe to increase demand on public services such that new or physically altered government facilities would be required.

The significance criteria above also considers impacts to other public facilities. Based on the Project characteristics the proposed 2018 General Use Permit was determined to have no potential impact on Other Public Facilities, which for the purposes of this EIR includes public libraries. As a major higher education institution Stanford provides extensive on-campus library facilities and related services to accommodate the library demands of its student, faculty, and staff, and would expand those facilities as needed with development of new academic facilities under the proposed 2018 General Use Permit. Consequently, it is highly unlikely that the increased student and faculty population to be accommodated under the proposed 2018 General Use Permit would necessitate the need for new off-campus public libraries. Therefore, for the purposes of this analysis, other services are not further addressed.

Impact Evaluation

Construction Impacts

Construction workers related to the construction at Stanford under the 2018 General Use Permit would live through the Bay Area, and the school-age children of these workers would be enrolled in the applicable school districts where the construction workers reside. Consequently, the Project would not result in the potential for new or altered school facilities to be necessary to meet the needs of construction workers. Accordingly, the analyses below focuses on potential construction-related impacts to public fire protection, EMS and police protection services.

[3] See *City of Hayward v. Board of Trustees of the California State University*(2015) 242 Cal.App.4th 833, 843.
[4] See *Goleta Union School Dist. v. Regents of the Univ. of California* (1995) 37 Cal.App.4th 1025, 1031-1032.

Impact 5.13-1: Project construction could increase demand for fire protection, emergency medical service and police protection services but would not result in an adverse physical impact from the construction of additional fire protection, emergency medical, or police protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)

As described in the Environmental Setting above, the Palo Alto Fire Department (PAFD) provides fire protection and EMS services to the Project site, and maintains firefighters, including paramedics, and fire-fighting and medical response apparatus at on-campus Fire Station 6. With regard to police protection services, the Project site is served by the on-campus Stanford Department of Public Safety (DPS) for law enforcement, crime prevention, emergency response, and traffic and parking control. The Stanford DPS also receives support from the Santa Clara County Sheriff's Department for certain investigations. Stanford receives emergency dispatching services through the Palo Alto Police Department (PAPD) Communications Center.

Construction of individual projects under the proposed 2018 General Use Permit would result in temporary increases in vehicle congestion, delays and potential conflicts in the construction site vicinities and/or along construction haul routes; as well as the potential for construction worker accidents and medical emergencies at the construction sites, potentially requiring associated temporary increases in responses from public fire protection, EMS and/or police protection services to these incidents.

In general, the type and intensity of construction activities under the proposed 2018 General Use Permit, and consequently, the nature and level of responses to Project construction-related incidences by fire protection, EMS and police protection services, would be similar to that which have occurred under the 2000 General Use Permit. As under the 2000 General Use Permit, all construction activities that would occur at construction sites under the Project would be required to be conducted in compliance with applicable regulations, including Cal/OSHA standards and practices for worker safety, minimizing the need for public fire protection and emergency service response to worker accidents at construction sites.

In addition, as discussed in Section 5.15, Transportation and Traffic, Mitigation Measure 5.15-1 would ensure appropriate construction traffic control measures would be implemented for individual construction projects under the proposed 2018 General Use Permit to minimize on- and off-site construction traffic effects, and further minimizing potential construction traffic incidents requiring public fire, EMS and police response. This includes a requirement to inform Stanford DPS and the PAFD of construction locations, and designating alternate evacuation and emergency routes to maintain adequate fire protection and police response during construction periods.

As under the 2000 General Use Permit, during the proposed 2018 General Use Permit, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s) and for communication and emergency dispatch services from the PAPD.

While construction would periodically occur over the duration of the 2018 General Use Permit, construction activities in and of themselves would not generate a significant additional demand for public fire protection, EMS and/or police services that would require new or physically altered facilities. Therefore, the proposed 2018 General Use Permit would generate a less-than-significant construction impact related to fire protection, EMS and police protection services. See also Impacts 5.13-2 and 5.13-3, below.

Mitigation: None required.

Operational Impacts

Impact 5.13-2: Operation of uses under the Project would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)

The proposed 2018 General Use Permit would increase development on the Project site, and increase the resident and commuter population, which would increase demand for public fire protection and EMS services. The increase in development and population under the Project would occur within existing urbanized areas of the campus, and consequently, would be served by the existing on-campus Fire Station 6.

As discussed above, the PAFD provides fire protection and EMS to the Project site, and maintains firefighters, including paramedics, and fire-fighting and medical response apparatus at Fire Station 6. PAFD and Stanford DPS currently share a combined facility that serves as Fire Station 6 and Stanford's police facility. However, as discussed under 2018 Baseline Environmental Setting, the Stanford DPS is relocating to the planned Public Safety Building and Departmental Operations Center in Stanford's Bonair Corporation Yard. This relocation will in turn serve to provide additional operational space for PAFD or another provider at Fire Station 6 to use, if needed.

While no specific need for new or physically altered public fire protection/EMS facilities is identified for the Project, the proposed 2018 General Use Permit would allow for authorization of expanded or new academic support development, which could include additional on-campus fire protection/EMS facilities, if needed to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under the proposed 2018 General Use Permit are addressed throughout Chapter 5 of this EIR.

As under the 2000 General Use Permit, during the proposed 2018 General Use Permit, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s). The City of Palo Alto and Stanford are currently under a five-year contract for PAFD to provide fire protection and EMS services to Stanford, with automatic renewal.

New development that would occur on the Project site under the proposed 2018 General Use Permit would require fire and life safety code compliance. As described under Environmental Setting, these services are currently provided by the Stanford University Fire Marshal's Office (SUFMO). As under existing conditions, under the proposed 2018 General Use Permit as new individual developments are proposed the SUFMO would review building plans to ensure the project provides for adequate emergency access, fire hydrants, automatic sprinkler systems, fire alarm systems, water flow, and other fire code requirements. The SUFMO would also inspect the construction work as it progresses to ensure that each individual development meets applicable code compliance.

Given all the above factors, increases in development on the Project site, and increase in resident and commuter population under the proposed 2018 General Use Permit would increase demand for fire protection and emergency medical services, however, would not result in an adverse physical impact from the construction of additional fire protection or emergency medical service facilities. Therefore, operation of the proposed 2018 General Use Permit would generate a less-than-significant impact related to fire protection and EMS services.

Mitigation: None required.

Impact 5.13-3: Operation of development under the proposed Project would increase demand for police protection services. (*Less than Significant*)

The proposed 2018 General Use Permit would increase development on the Project site, and increase the resident and commuter population, which would increase demand for police protection services. The Project site is served by the Stanford DPS for law enforcement, crime prevention, emergency response, and traffic and parking control. Stanford also has certain investigative support from the Santa Clara County Sheriff's Department, and contracts with the PAPD for emergency dispatching services.

As discussed, above, the Stanford DPS is relocating on-campus to Stanford's planned Public Safety Building and Departmental Operations Center. This planned facility is expected to provide adequate space for Stanford DPS to operate throughout the life of the proposed 2018 General Use Permit. Apart from this planned facility, no additional new on-campus facilities to house police services are contemplated by Stanford DPS under the proposed Project. The proposed 2018 General Use Permit would nonetheless allow for new and/or expanded academic support development, which could include additional Stanford DPS facilities, if needed, to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under the 2018 General Use Permit are addressed in Chapter 5 of this EIR.

As it does under the 2000 General Use Permit, during the proposed 2018 General Use Permit Stanford would pay the City of Palo Alto a fair share contribution annually as compensation for the communication and emergency dispatch services it would receive from the PAPD.

In addition, as discussed under Environmental Setting, the City of Palo Alto is also planning a new Public Services Building that would house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City. This facility will be subject to future environmental review by the City, and is anticipated to be completed and operational in 2021.

Given all the above factors, increases in development on the Project site and increase in resident and commuter population under the proposed 2018 General Use Permit would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional police protection facilities. Therefore, operation of the proposed 2018 General Use Permit would generate a less-than-significant impact to police protection services.

Mitigation: None required.

Impact 5.13-4: The proposed Project would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

The proposed 2018 General Use Permit would increase the residential population at the Project site, including school-age children. This EIR uses student generation rates based on children per household to estimate the number of school-age children that would be generated as a result of increased campus population under the proposed 2018 General Use Permit. Rates of 0.23 for elementary school, 0.12 for middle school, and 0.15 for high school were used, for a total student generation rate of 0.50. These student generation rates used are consistent with the moderate student generation rates used by PAUSD's demographer, DecisionInsite, in its latest Residential Research Summary Report (PAUSD, 2016c).[5]

Table 5.13-3 summarizes the estimated enrollment in PAUSD schools from students generated under the proposed 2018 General Use Permit. As discussed in Chapter 3, Project Description, under the proposed 2018 General Use Permit, Stanford proposes 550 new housing units that could be occupied by faculty and staff, including postdoctoral students and medical residents. Application of the student generation ratios to the proposed 550 units results in an estimated increase of 275 additional school-age children.

As shown in Table 5.13-3, the addition of 275 school-age students to the PAUSD would be diffused over various grade levels and schools. Since buildout of the proposed 2018 General Use Permit, including residential units for faculty and staff, would occur incrementally over an approximate 17 year span, the school-age students generated by the Project that would be added to PAUSD schools would also occur incrementally over this span.

[5] These rates are also consistent with the student generation rates used by the City of Palo Alto for multifamily housing in its Comprehensive Plan Update Supplement to the Draft EIR.

TABLE 5.13-3
ESTIMATED PAUSD ENROLLMENT FROM STANFORD 2018 GENERAL USE PERMIT

Schools	Number of Units	Student Generation Rates[a]	Estimated Number of Students
Elementary	550	0.23	127
Middle School	550	0.12	66
High School	550	0.15	82
Total		**0.50**	**275**

NOTES:
[a] Student generation rates from PAUSD, *Residential Research Summary,* Fall 2016 prepared by DecisionInsite, November 2016.

As described under Environmental Setting, currently, PAUSD middle school enrollment slightly exceeds PAUSD middle school capacity, whereas PAUSD elementary and high school enrollment are within PAUSD capacity. However, the PAUSD projects a decline in both its elementary and middle school student enrollment through its planning horizon of 2026/27. In addition, while PAUSD projects a near-term increase in its high school enrollment until 2020, it projects a decline in its high school enrollment thereafter through 2026/27 (PAUSD, 2016a,b,c). This projected decline in its enrollment would further serve to lessen the effect of Project-generated school-age children that would attend PAUSD schools on student capacity.

If conservatively assuming that all of the Project-generated students would be added to the PAUSD schools prior to PAUSD's current planning horizon of 2026/27, when considering the existing student capacities of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27 planning horizon, there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated Project-generated added students in 2026/27.

The PAUSD is currently preparing its 2018 Facilities Master Plan. However, the PAUSD does not currently have any planned projects that would increase the existing student capacity at its schools (Golton, 2017). In the event any PAUSD school expansion occurs, PAUSD would be required to undergo site-specific environmental review, as appropriate, prior to consideration of approval by the PAUSD.

Pursuant to California Government Code Sections 65995.5 through 65997, and related impact fees established by the PAUSD, school impact fees are charged for new residential and commercial development that would be developed by Stanford under the proposed 2018 General Use Permit. Pursuant to Government Code section 65997, payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with the proposed Project.

When considering all the above factors, while the proposed Project would increase enrollment in local public school the Project would not result in adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards.

Please also refer to Section 6.4 in Chapter 6, Other CEQA Issues, for a discussion of potential growth inducing effects of the Project associated with the increase in off-site population in students, faculty, staff and other workers.

Mitigation: None required.

Cumulative Impacts

Impact 5.13-5: Implementation of the proposed Project in combination with past, present, and reasonably foreseeable projects, would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

A significant cumulative environmental impact would result if, in combination with other past, present, and reasonably foreseeable development, buildout of the proposed 2018 General Use Permit would exceed the ability of fire and emergency medical responders to adequately serve the vicinity, thereby requiring construction of new facilities or modification of existing facilities. This section analyzes potential impacts to fire protection services that could occur from the proposed Project in combination with reasonably foreseeable growth in the PAFD service area. As discussed in the Environmental Setting, the PAFD service area includes the jurisdictional boundaries of Palo Alto in addition to some of the unincorporated land surrounding the city limits, including the Project site.

As discussed in Impacts 5.13-1 and 5.13-2, above, the Project's impact to PAFD's fire protection and EMS services is determined to be less than significant. Sufficient fire protection facilities would exist on campus to the serve additional development and population under the proposed 2018 General Use Permit. Furthermore, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s).

The City of Palo City is implementing a number of improvements to PAFD fire station facilities in its City, including improvements to Fire Station 1 by 2019, replacement of Fire Station 3 by 2019, and a planned replacement of Fire Station 4 by 2020. The PAFD indicates with these planned improvements, the PAFD can adequately serve the increased demand from increased growth and buildout of the City (Nickel, 2017). Annual City reviews and monitoring of fire department services and performance metrics (including response times) that is conducted by the City would help to ensure that the PAFD would continue to adequately meet the demands of the city and accommodate growth not only by the Project but from throughout the city.

Therefore, the cumulative impact under the 2018 General Use Permit would be less than significant.

Mitigation: None required.

Impact 5.13-6: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Cumulative impacts are considered in the context of the growth and development under the proposed 2018 General Use Permit as they are within the service area of Stanford DPS, as well as that of the PAPD and the Santa Clara County Sheriff's Department. A significant cumulative environmental impact would result if this cumulative growth would exceed the ability of these police protection services to adequately serve the vicinity, thereby requiring construction of new facilities or modification of existing facilities.

As discussed in Impacts 5.13-1 and 5.13-3, above, the proposed Project's impact on police protection services, including Stanford DPS, PAPD and the Santa Clara County Sheriff's Department, is determined to be less than significant. Stanford DPS is relocating on-campus to its planned Public Safety Building and Departmental Operations Center which will provide adequate space for Stanford DPS to operate under the proposed 2018 General Use Permit. In addition, the City of Palo Alto planned new PSB will house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City. Additionally, annual City reviews and monitoring of law enforcement services and performance metrics (including dispatch response times) that is conducted by the City of Palo Alto would help to ensure that the PAPD would continue to adequately meet the demands of the city and are able to accommodate growth not only by the Project but from throughout the city.

Therefore, implementation of the Project in combination with past, present, and reasonably foreseeable projects would have a less-than-significant cumulative effect with respect to police protection services.

Mitigation: None required.

Impact 5.13-7: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

This section analyzes potential impacts related to schools that could occur from implementation of the proposed 2018 General Use Permit in combination with reasonably foreseeable growth in PAUSD's service area. Cumulative development within the PAUSD service area would generate new students to PAUSD, which could result in the need for new or expanded school facilities.

As discussed in Impacts 5.13-4, above, when considering the existing student capacity of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27 planning horizon, there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated Project-generated added students in 2026/27. Furthermore, Stanford's payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with the proposed Project.

It should be noted that the City of Palo Alto is currently undergoing environmental review for an update to its Comprehensive Plan that is considering a range of future growth scenarios, some of which would result in PAUSD student enrollment exceeding existing PAUSD capacity for its elementary, middle and/or high schools. However, no specific future growth scenario has been selected or approved by the City at this time; if and when that occurs, the PAUSD would be responsible for updating it enrollment forecast, as needed.

As with the Project, all other cumulative projects within the PAUSD service area would also be subject to the school development fees. Further, if it is determined that additional school facilities are needed as growth occurs, expansion and/or construction would be subject to separate environmental review, thereby providing an opportunity to identify and mitigate associated environmental impacts. Therefore, cumulative impacts related to school facilities under the proposed 2018 General Use Permit would be less than significant.

Mitigation: None required.

5.13.6 References

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5.14 Recreation

5.14.1 Introduction

This section evaluates potential environmental effects associated with implementation of the proposed 2018 General Use Permit to public park, recreation and open space facilities. This section includes a description of the existing and 2018 baseline environmental settings, criteria used to determine impact significance, a discussion of potential impacts; and identifies regulatory mechanisms and/or feasible mitigation measures, as necessary, to reduce potential impacts. The section relies in part on the Parks and Recreation Facilities Analysis prepared by Stanford in support of its 2018 General Use Permit application (see Appendix REC), which was peer reviewed by ESA, as well as park and recreation information provided by the City of Palo Alto and the City of Menlo Park.

5.14.2 Existing Environmental Setting

Students, faculty, and staff at Stanford currently use on- and off-campus recreation facilities. In addition, Stanford has constructed and maintains numerous recreational and open space facilities around and within the campus. As such, this subsection considers on-site recreation and open space facilities, and off-campus public parks, recreation facilities and open space.

As described in greater detail in Section 5.12, Population and Housing, in this EIR, the current 2017 on-campus residential population associated with Stanford is approximately 14,900. This is comprised of undergraduate students, graduate students, post-doctoral students as well as faculty, staff, and their family members.

On-Campus Recreation Facilities and Open Space

Stanford provides athletic and recreation facilities, and open space areas, consisting of groves, lawns, courtyards, and plazas that support outdoor gatherings, picnicking, casual recreation, and peaceful contemplation. These on- facilities are used by its students, faculty and staff; in addition, members of the public use recreational facilities on Stanford lands that are open to the public.

Under the 2000 General Use Permit, Stanford relocated or replaced some of its existing recreation and open space facilities, and also used about 290,000 square feet of its 2.035 million authorized net new academic and academic support square footage for new athletic and recreation facilities and expansion of existing athletic and recreation facilities. In addition, Stanford expanded its Stanford Campus Residential Association (SCRA) sports complex with square footage authorized for community centers.

On the Project site within the Academic Growth Boundary Stanford maintains approximately 265 acres of Campus Open Space as designated in the Stanford Community Plan, including the Arboretum, the Oval and the area surrounding Lagunita. Stanford also maintains a network of trails around the campus perimeter (e.g., Stanford Perimeter Trail), as well as throughout the areas of lands designated Campus Open Space. The Stanford Perimeter Trail links to the

Matadero Creek Trail, which runs along Page Mill Road. In addition to these primary multi-use paths, Stanford maintains four miles of the Dish Recreation Route which provides hiking and jogging access to the public from approximately sunrise to sunset throughout the year.

A breakdown of existing on-campus recreation facilities and Campus Open Space is displayed in **Figure 5.14-1** and supplemented by **Table 5.14-1**, below.

Off-Campus Public Parks, Recreation Facilities and Open Space

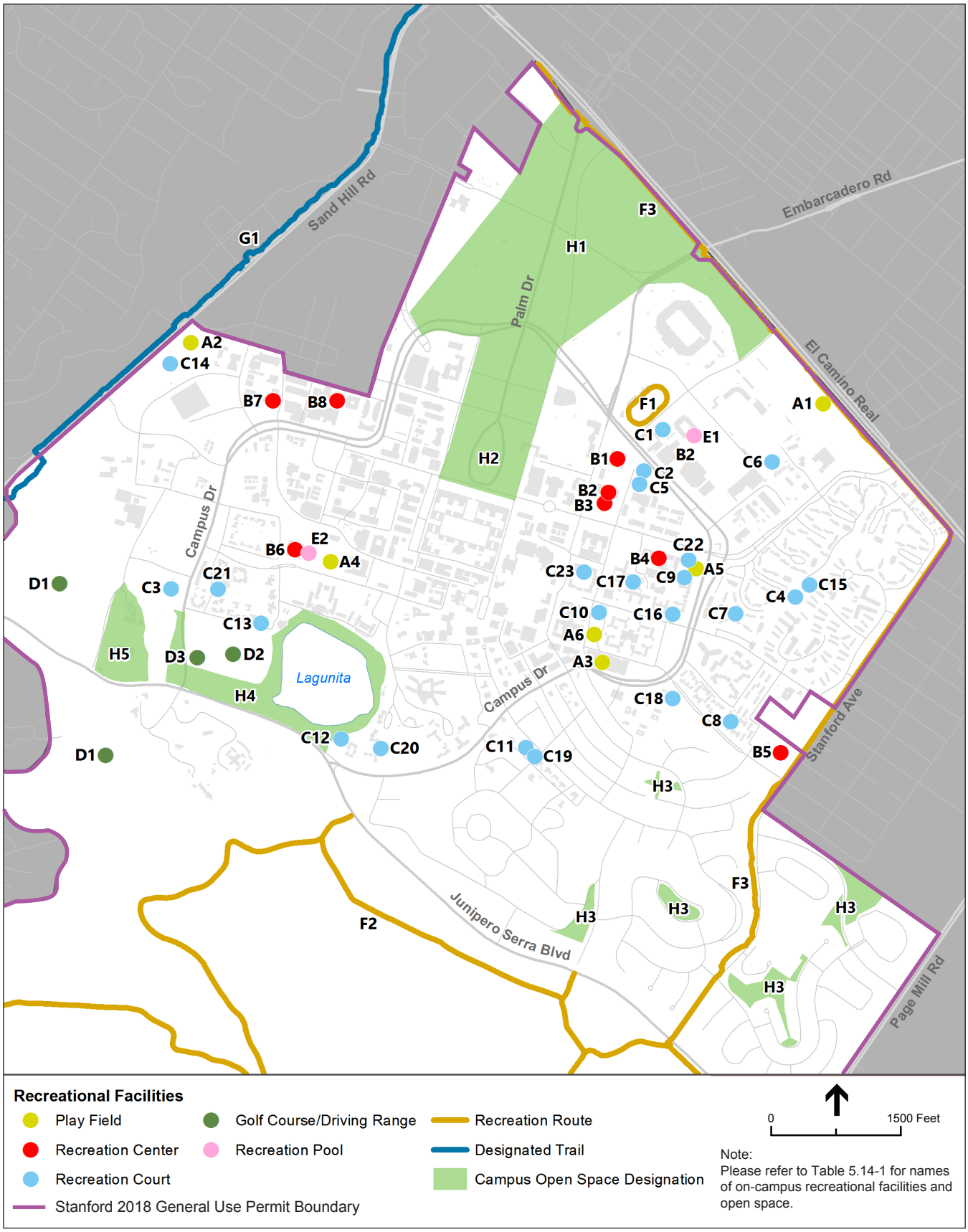
In addition to its on-campus open space and recreation facilities, the Project site is located adjacent to the cities of Palo Alto and Menlo Park, towns of Woodside and Portola Valley, and unincorporated San Mateo County, which provide public parks, recreation facilities and open space. Living in nearby communities, Stanford students, faculty, and staff may use public parks, recreation facilities, and open space in these surrounding areas. The off-campus regional parks, major open space areas, trails, local parks and recreation facilities that would most likely be utilized by Stanford population are considered within a three-mile radius. A breakdown of those existing parks, recreation facilities, and open spaces are displayed in **Figure 5.14-2**, outlined in **Table 5.14-2**, and discussed in greater detail below.

Regional Park and Open Space Areas

Regional park and open space areas provide places where people can enjoy active and passive recreation activities that focus on interaction with the natural environment. These activities typically include nature studies, camping, hiking, observing the natural landscape, and similar activities. Regional park and open space areas often encompass hundreds of acres and are typically established in order to protect uniquely valuable natural resources. Therefore each regional park and open space area is unique and offers specific recreational opportunities that are not otherwise available in the immediate vicinity of most residents. Within Santa Clara County, regional park and open spaces areas are owned and managed by federal and/or state governments, regional districts (e.g., the Midpenisula Regional Open Space District), non-profit organizations, and/or local municipalities.

Near the Project site, regional parks and open spaces are managed by the City of Menlo Park and the City of Palo Alto. Both cities define open spaces similarly. The City of Palo Alto defines open space as “any parcel or area of water or land that is essentially unimproved and devoted to an open space use for the purpose of (1) the preservation of natural resources; (2) the managed production of resources; (3) outdoor recreation; or (4) public health and safety” (City of Palo Alto, 2007a).

The City of Menlo Park defines open space as “an open area that is primarily maintained in its natural condition and is essentially unimproved and devoted to an open space use for the purposes of (1) the preservation of natural resources, (2) the managed production of resources, (3) outdoor recreation, or (4) public health and safety. In some cases, this definition includes pathways, landscaping and other improvements that are maintained. The provision of open space is intended to offer residents and visitors opportunities for quiet introspection in a location that provides visual relief from buildings, concrete and noise associated with more urban life” (City of Menlo Park, 2013).



Recreational Facilities

- Play Field
- Recreation Center
- Recreation Court
- Stanford 2018 General Use Permit Boundary
- Golf Course/Driving Range
- Recreation Pool
- Recreation Route
- Designated Trail
- Campus Open Space Designation

0 1500 Feet

Note:
Please refer to Table 5.14-1 for names of on-campus recreational facilities and open space.

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SOURCE: Stanford LRBE LUEP, 2017

Figure 5.14-1
Existing On-Campus Recreation Facilities and Campus Open Space

TABLE 5.14-1
EXISTING ON CAMPUS RECREATION FACILITIES AND CAMPUS OPEN SPACE

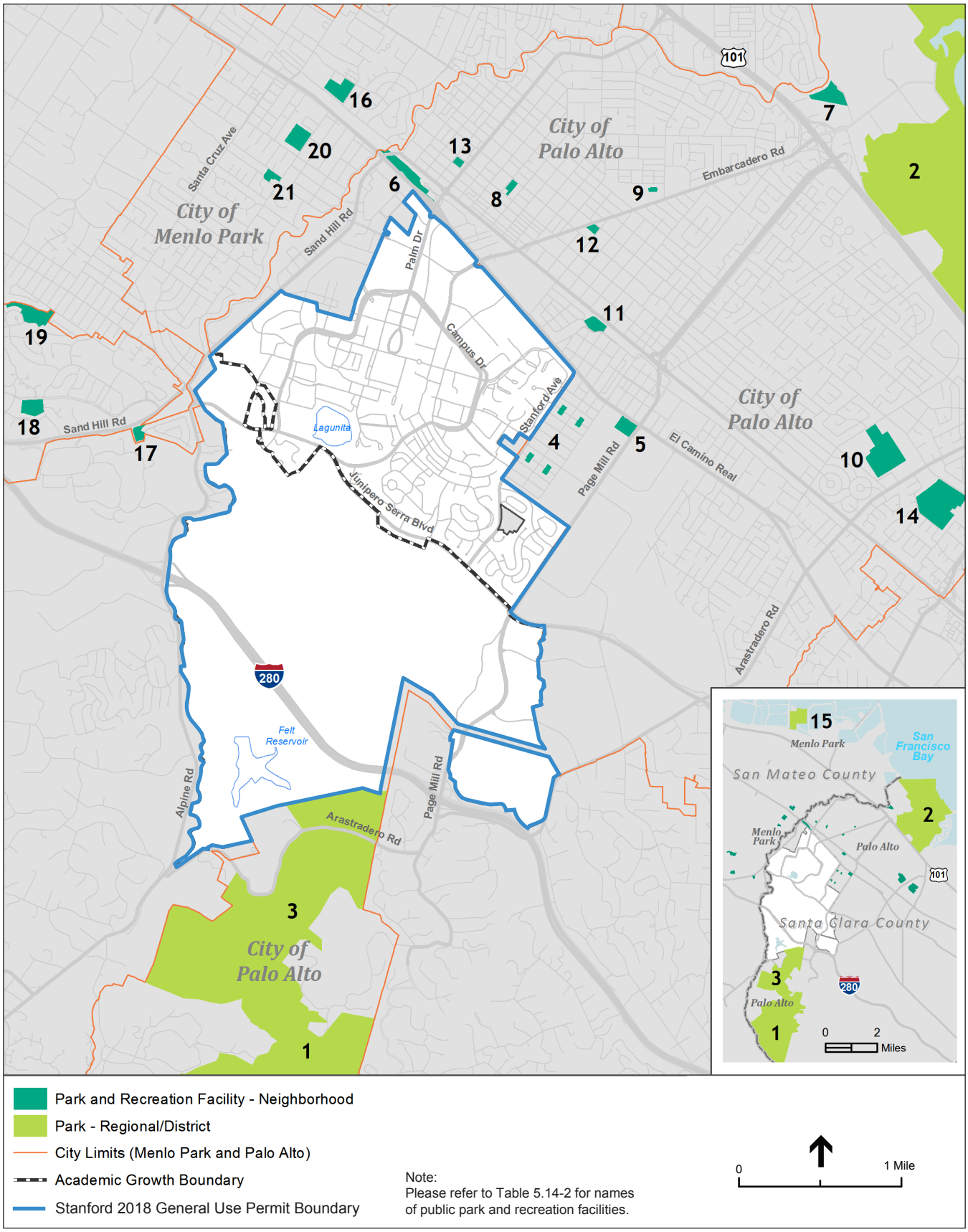
Use	Figure Reference[a]	Size/Quantity	Comments
A. Recreation Play Fields			
Intramural sports, club sports, general recreation	A1	13 acres at El Camino Real	Some fields are for intramural and club sports, managed by the Department of Athletics, Physical Education and Recreation under a reservation system, and provide general recreation for the Stanford community and public when not reserved for athletics. Other fields are managed by Residential and Dining Enterprises and are accessed on a first-come, first-served basis, for general recreation purposes.
	A2	10 acres at Sand Hill Road	
General recreation	A3	4 acres at Wilbur Field, on top of the Wilbur Field Garage	
	A4	1.5 acres on top of underground Roble Garage	
	A5	0.8 acres at Manzanita Field	
	A6	0.6 acres at Arguello Field and Courts	
B. Recreation Centers			
General recreation	B1	Arrillaga Center for Sports and Recreation (ACSR)	ACSR, Ford Center and Burnham Pavilion currently open to Stanford affiliates M-Thu from 6a–11p, Fri from 6a–10p and Sa-Su from 9a–10p. SCRA currently is open 5a–10p every day to members. AOERC currently open to Stanford affiliates M-Thu from 5:30a–12a, Fri from 5:30a–11p and Sa-Su from 8a–10p. The LKSC fitness center currently is open 24 hours a day. The Schwab Residential fitness center is open to student residents only.
	B2	Ford Center	
	B3	Burnham Pavilion	
	B4	Schwab Residential Center fitness center	
	B5	Stanford Campus Recreation Association (SCRA)	
	B6	Arrillaga Outdoor Education and Recreation Center (AOERC)	
	B7	School of Medicine Outdoor recreation area	
	B8	Li Ka Shing Center (LKSC) fitness center	
Climbing	See B1	ACSR Bouldering Center	ACSR Bouldering Center currently open to Stanford affiliates M-Thu from 6a–11p, Fri from 6 a–10p and Sa-Su from 9a–10p. AOERC Climbing Center currently open to Stanford affiliates at lunch and evening hours M-Thu and Su afternoons. Families of Stanford affiliates are welcome on weekends.
	See B6	AOERC Climbing Center	
C. Recreation Courts			
Tennis	C1	Eight at Taube	Currently available for sign-up M-Th when classes not scheduled and all day F-Su. Currently reserved for faculty and staff M-F from 12p–1p. Escondido Village tennis courts are available on a first-come, first-served basis.
	C2	Six at Taube South	
	C3	Eight at West Campus	
	C4	Three at Escondido Village	
Sand Volleyball	C5	Two at Ford Quad	Those at Ford Quad and Nelson Mall currently available during daylight hours outside of varsity use. Others available on a first-come, first-served basis.
	C6	Four at Nelson Mall	
	C7	One at Escondido Village	
	C8	Two at Rains	
	C9	One at Manzanita Field	
	C10	Two at Arguello Field	
	C11	Five at Mayfield Row	
	C12	One at Lake Houses	
	C13	One at Governor's Corner	
	C14	Two at Sandhill Fields	

TABLE 5.14-1 (CONTINUED)
EXISTING ON CAMPUS RECREATION FACILITIES AND CAMPUS OPEN SPACE

Use	Figure Reference[a]	Size/Quantity	Comments
C. Recreation Courts (cont.)			
Paved Basketball	C15	Two at Escondido Village	Available on a first-come, first-served basis.
	C16	Two at Castano Greens	
	C17	Two at Branner/Toyon	
	C18	One at Cowell	
	C19	Twelve at Mayfield Row	
	C20	Three at Lake Houses	
	C21	Three at Governor's Corner	
	C22	Two at Manzanita Field	
Bocce ball	C23	One at Crothers	Available on a first-come, first-served basis.
D. Golf Course and Driving Range			
Golf and golf practice	D1	18 holes	Course available to Stanford affiliates by reservation. Range open to public when classes not scheduled. Golf Learning Center open for summer camps.
	D2	55 hitting tees at range	
	D3	Golf Learning Center to be completed Spring 2017	
E. Recreation Pools			
Swimming	E1	One 50 meter recreation pool at Avery Aquatic Center	Avery Aquatic Center currently open to Stanford affiliates M-F from 10a–2p. Avery Rec Pool open M-F from 7a–8p and Sa-Su from 12p–6p.
	E2	One 50 meter recreation pool at the Avery Recreation Pool at the AOERC	
F. Recreation Routes			
Walking, jogging	F1	400m, nine-lane oval at Angell field	Tracks currently open daily 8a to dusk. Recreation access is allowed on portions of existing service roads in "dish" area of foothills. The "dish" is open approximately sunrise to sunset daily. The Stanford Perimeter Trail currently is open all day and night.
	F2	Dish Recreation Route, approximately 4 miles	
	F3	Stanford Perimeter Trail, approximately 3.4 miles	
G. Designated County Trails			
Walking, jogging	G1	Designated Trail C-1	See Figure BCR.14 in Appendix BCR -- Background Conditions Report for the location of these trails.
	G2	Designated Trail C-2	
	G3	Designated Trail S-1	
H. Designated Campus Open Space			
General recreation	H1	Arboretum	Campus Open Space areas are currently unfenced and open at all times; however, many areas are not well lit and nighttime use is not encouraged. (Overall area is approximately 265 acres)
	H2	The Oval	
	H3	San Juan neighborhood parks	
	H4	Lagunita and surroundings	
	H5	Red Barn and equestrian facilities	

[a] Figure references are associated with recreation facilities shown on Figure 5.14-1.

SOURCE: Stanford, *Park and Recreation Facilities Analysis,* 2017. (Refer to Appendix REC)



SOURCE: Stanford LRBE LUEP, 2017

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Figure 5.14-2
Existing Public Park and Recreation Facilities in Project Site Vicinity

TABLE 5.14-2
PUBLIC PARK AND RECREATION FACILITIES IN THE PROJECT SITE VICINITY

Park Type	Figure Reference[a]	Name	Acres[b]
Palo Alto			
Regional/District	1	Foothills Park/Open Space Preserve	Total 1,400; Active 26.7
	2	Baylands Nature Preserve	Total 1,940; Active 9.2
	3	Pearson-Arastradero Preserve	Total 622; Active 6.2
Neighborhood Parks and Recreation Facilities	4	Neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks)	4.4
	5	Mayfield (Stanford-Palo Alto) playing fields	5.9
	6	El Camino Park	12.2
	7	Baylands Athletic Center fields	10.0
	8	Heritage Park	2.01
	9	Rinconada Pool	NA
	10	Mitchell Park	21.4
	11	Peers Park	4.7
	12	Lawn Bowling Green	1.9
	13	Avenidas Senior Center	NA
	14	Cubberley Community Center	NA
Menlo Park			
Regional/District	15	Bedwell Bayfront Park	Total 160; Active 7.0
Neighborhood Park and Recreation Facilities	16	Civic Center recreation facilities	9.3
	17	Stanford Hills Park	3.1
	18	Sharon Park	9.8
	19	Sharon Hills Park	11.5
	20	Nealon Park	9.0
	21	Jack W. Lyle Park	4.6

[a] Figure references are associated with recreation facilities shown on Figure 5.14-2.
[b] Acreages of all parks were obtained from Palo Alto or Menlo Park City websites and documents, except for Sharon Hills Park, which was calculated by Stanford. Please see Appendix REC in this EIR for calculations on "actively used" park areas for regional/district parks.

SOURCE: Stanford, *Park and Recreation Facilities Analysis,* 2017. (Refer to Appendix REC)

Regional park and open space areas within three miles of the Project site boundary include, but are not limited to: Foothills Park/Open Space Preserve, Baylands Nature Preserve, and Pearson-Arastradero Preserve, each managed by the City of Palo Alto; and Bedwell Bayfront Park, managed by the City of Menlo Park (refer to Figure 5.14-2 and Table 5.14-2). The closest regional park is the Pearson-Arastradero Preserve located at 1530 Arastradero Road in Palo Alto, south of the Project site. Because both the cities of Menlo Park and Palo Alto identify open space as primarily for the purpose of preservation of natural resources as well as for outdoor recreation, this setting further distinguishes the area of these preserves as both the overall open space acreage and the more focused pedestrian use of actively used acreage. Collectively, these parks provide over 4,000 acres of open space and approximately 49 acres of actively used acreage (Appendix REC).

Local Public Parks

In addition to regional parks and open space, Stanford's on-campus residential population may also use local parks and recreation facilities managed by the cities of Palo Alto and Menlo Park. As defined by the general plans of both the cities of Menlo Park and Palo Alto, parks can be considered areas of open space set aside for recreational use and are located within an acceptable distance from the people they serve. For the purpose of this EIR, local park and recreation or community facilities which would likely be utilized by the Stanford population are considered within a three-mile radius. Figure 5.14-2 and Table 5.14-2 below present these neighboring recreation facilities, many of which are located within one-mile of the Project site.

The City of Palo Alto defines a Neighborhood Park as "a Park of roughly two to 10 acres in size, intended to meet the recreation needs of people living or working within a one-half mile radius." The City of Palo Alto General Plan Glossary defines a community facility as a "facility in which public services for Palo Alto residents are provided, including recreational and cultural services, and services for youth and seniors (City of Palo Alto, 2007a). The City of Palo owns and operates 29 neighborhood and district parks that total approximately 190 acres. They include ten "mini-parks" that range in size from one-half acre to two acres. These parks generally include small playgrounds for children and/or grass and landscape areas for playing or sitting. Most of the other parks are "neighborhood" parks and provide a mix of active and passive recreational areas. There are also three "district" parks that serve larger areas and contain a wider range of facilities. The district parks provide playing fields, picnic grounds, and community centers.

The City of Palo Alto Comprehensive Plan identifies that, because of the "built-out" nature of the community, it is unlikely that many new parks would be created in Palo Alto, and rather the maintenance and rehabilitation of existing facilities continues to be the City's primary concern relating to parks (City of Palo Alto, 2007c, page C-4).

The City of Menlo Park General Plan defines a Park as "an improved, primarily unobstructed area, with landscaping and recreational equipment such as play apparatuses and/or basketball courts. In some cases this definition includes property with recreation buildings or structures. The purpose of parks is to provide opportunities for outdoor recreation and physical exercise near to residential and employment areas" (City of Menlo Park, 2013). The Menlo Park Community Services Department owns and operates park and recreational facilities in the City of Menlo Park. The City has adopted a goal of maintaining a ratio of five acres of developed parkland per 1,000 residents. Currently, the City provides a net of approximately 221 acres of parkland for the residents, with a ratio of 6.79 acres per capita (City of Menlo Park, 2013).

Existing Conditions of Off-Campus Public Park and Recreation Facilities

Based on review of the descriptions of public park and recreation facilities in municipal documents, none of the public park or recreation facilities are identified as substantially deteriorated. Cyclical maintenance upgrades are included in the capital budget programs, and the public park and recreation facilities appear to be well-maintained.

These descriptions of the existing off-campus public park and recreation facilities were confirmed by observations of each of the nearby facilities listed in Table 5.14-2 conducted by Stanford in 2016. These observations failed to identify any cases of substantial deterioration. They did however, observe widespread browning of natural turf, though this was likely associated with the recent prolonged drought; City documents and local news sources confirm that both Palo Alto and Menlo Park had reduced watering turf and planted areas, except for formal sports fields. This suggests that that the effects of the prolonged drought and the reduction in watering may have contributed to limited deterioration in the condition of certain parks. There was no documentation that substantial deterioration is occurring due to an increase in visitorship (Appendix REC). In 2017, ESA verified these observations with a mid-summer reconnaissance of the recreation facilities listed in Table 5.14-2. This reconnaissance verified the conditions of the Stanford 2016 audit, with the added observation that even in mid-summer, the turfs at all park facilities appeared to be in an improved state from 2016, being predominately green where irrigated.

5.14.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are currently under construction; this housing is not expected to be completed and occupied until approximately 2020.

No substantial changes in the amount and/or use of on-site recreation facilities and open space would occur between the existing environmental setting and the 2018 environmental baseline. Therefore, apart from the expected incremental increase in on-campus residential population (from approximately 14,900 under the existing setting to approximately 15,340 by the Fall 2018, an increase of nearly 440 persons) which would result in a proportional increase in recreation and open space demand, the conditions described above for the existing environmental setting for the Project site are also largely representative of the 2018 environmental baseline.

Similarly, no substantial changes in the amount and or use of off-site public parks, recreation facilities and open space would occur between the existing environmental baseline and the 2018 environmental baseline. It should be noted the Parks and Recreation Facilities Analysis considered the effect of the increase in campus residential population anticipated between the existing environmental setting and the 2018 baseline on nearby public parks, recreation facilities and open space, using an approach and methodology similar to that described for the Project (see Section 5.4.15 below) and concluded that those effects would be minimal. Consequently, the conditions described above for the existing environmental setting for off-site public parks, recreational facilities and open space are also largely representative of the 2018 environmental baseline.

5.14.4 Regulatory Setting

Federal

There are no relevant federal regulations regarding recreation applicable to the proposed Project. State and County of Santa Clara regulations are described below.

State

The Quimby Act

The Quimby Act 1975 (California Government Code Section 66477) authorizes cities and counties to pass ordinances requiring that developers support park improvements by setting aside land, donating conservation easements, or paying fees. The required dedication and/or fee are based upon the residential density and housing type, land cost, and other factors. Land dedicated and fees collected pursuant to the Quimby Act may be used for developing new, or rehabilitating existing park or recreational facilities.

County of Santa Clara

Santa Clara County General Plan

While open spaces and lightly developed Stanford land under Santa Clara County's jurisdiction were historically designated "Academic Reserve and Open Space" in the Santa Clara County General Plan most recent designations under the 2016 Update to the Land Use Plan demonstrate that this area is designated "Major Educational and Institutional Uses" (R-LU 63) (Santa Clara County, 2016). Open Space policies relating to this land are contained throughout the Santa Clara County General Plan, and are most concentrated in the chapters on Growth and Development, Parks and Recreation, Resource Conservation, and Health and Safety. Additionally, the Santa Clara County General Plan also contains several goals and policies relevant to park and recreational facilities found in the Parks and Recreation, Resource Conservation, and General Land Management Chapters.

The Santa Clara County General Plan strategies and policies relevant to open space and recreation include:

Regional Parks and Public Open Space Lands

Strategy #1: Develop parks and public open space lands.

Policy R-PR 1 – An integrated and diverse system of accessible local and regional parks, scenic roads, trails, recreation facilities, and recreation services should be provided.

Policy R-PR 4 – The public open space lands system should:

a. preserve visually and environmentally significant open space resources; and

b. provide for recreation activities compatible with the enjoyment and preservation of each site's natural resources, with trail linkages to adjacent and nearby regional park lands

Strategy #2: Improve accessibility.

Policy R-PR 7 – Opportunities for access to regional parks and public open space lands via public transit, hiking, bicycling, and equestrian trails should be provided. Until public transit service is available, additional parking should be provided where needed.

Policy R-PR 8 – Facilities and programs within regional parks and public open space lands should be accessible to all persons, regardless of physical limitations, consistent with available financial resources, the constraints of natural topography, and natural resource conservation.

Strategy #3: Balance recreational and environmental objectives.

Policy R-PR 10 – Recreation facilities and activities within regional parks and public open space lands should be located and designed to be compatible with the long term sustainability of each site's natural and cultural resources, with particular attention to the preservation of unique, rare, or endangered resources (including historic and archeological sites, plant and animal species, special geologic formations, etc.).

Strategy #4: Facilitate inter-jurisdictional coordination.

Policy R-PR 16 – Parks and recreation system planning, acquisition, development, and operation should be coordinated among cities, the County, State and Federal governments, school districts and special districts, and should take advantage of opportunities for linkages between adjacent publicly owned parks and open space lands.

Policy R-PR 17 – The provision of public regional parks and recreational facilities of countywide significance both in urban and rural areas shall be the responsibility of county government.

Strategy #5: Encourage Private Sector and Non-Profit Involvement.

Policy R-PR 19 – The private sector and non-profit organizations should be encouraged to provide outdoor recreational opportunities. In rural areas, private recreational uses shall be low intensity

Policy R-PR 20 – Individual citizens, community organizations, and businesses should be encouraged to aid in regional parks and open space acquisition, development, and maintenance

Trails and Pathways

Strategy #1: Plan for Trails.

Policy R-PR 22.1 – Trail access should be provided for a range of user capabilities and needs (including persons with physical limitations) in a manner consistent with State and Federal regulations.

Policy R-PR 22.2 – Trails should be established along historically significant trail routes, whenever feasible.

Policy R-PR 23.1 – Trails should be routed along scenic roads where such routing is feasible.

Policy R-PR 24.1 – Encourage private developers to incorporate trail routes identified on the Countywide Trails Master Plan Map into their development project designs.

Strategy #2: Provide Recreation, Transportation, and Other Public Trail Needs in Balance with Environmental and Land Owner Concerns

Policy R-PR 25 – Trail routes shall be located, designed and developed with sensitivity to their potential environmental, recreational, and other impacts on adjacent lands and private property.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan and serves as the general plan for the campus and articulates the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The Stanford Community Plan Open Space chapter contains several strategies and policies relevant to open space and recreation:

Open Space

Strategy #1: Locate additional development inside the Academic Growth Boundary.

Policy SCP-OS 1 – Locate development inside the Academic Growth Boundary, allowing lands outside the boundary to continue as open space.

Policy SCP-OS 2 – Allow only field research and other uses that require a remote or foothill setting for their functioning in areas outside the Academic Growth Boundary. Do not permit any new development that is not associated with such uses.

Policy SCP-OS 3 – Identify and delineate Special Conservation areas where no development would be permitted.

Implementation Recommendations:

SCP-OS (i)1 – Prioritize and use infill sites and areas with potential for redevelopment within the AGB as locations for new development.

SCP-OS (i)2 – Require easements as appropriate in Special Conservation areas. Locate easements in areas which serve critical habitat needs.

SCP-OS (i)3 – Identify and pursue opportunities to remove existing obstacles to development within the Academic Growth Boundary in exchange for easement protection of lands outside the AGB.

Strategy #2: Balance recreational use and environmental objectives.

Policy SCP-OS 4 – Require dedication of trails on Stanford land as specified in the Countywide Trails Master Plan, consistent with environmental objectives, academic uses and with the priorities of the County Parks and Recreation Department.

Policy SCP-OS 5 – Protect sensitive habitat areas, areas used for academic purposes, and areas under active agricultural use in the alignment and design of trails.

Policy SCP-OS 6 – Plan for, design, and develop trails on Stanford lands in a manner consistent with the policies articulated in the Countywide Trails Master Plan.

Policy SCP-OS 7 – Minimize impacts of recreational activities on academic and environmental resources.

Policy SCP-OS 8 – Encourage Stanford to work with the community to allow public access to trails not included in the County Trails Master Plan in a way that minimizes impacts on academic and environmental resources.

Implementation Recommendations:

SCP-OS (i)4 – Coordinate efforts among Stanford and local agencies to define more precise trail alignments for the trails crossing Stanford lands as described in the Countywide Trails Master Plan, and to determine terms for trail development, maintenance, and liability.

SCP-OS (i)5 – Restrict access to sensitive habitat or hazardous areas, locations under ecological restoration, and research sites.

SCP-OS (i)6 – Develop programs to protect and restore overused or misused recreational areas.

Strategy #3: Plan for parks and open space land within the Academic Growth Boundary.

Policy SCP-OS 9 – Identify and preserve significant open space through use of the Campus Open Space designation in order to maintain the quality and character of the central campus.

Policy SCP-OS 10 – Require Stanford to maintain recreational open space to meet existing and future recreational needs of the Stanford community.

Policy SCP-OS 11 – Balance concerns about the maintenance of buffers between the University and Cities of Palo Alto and Menlo Park with the need for increased housing supply and improved affordability.

Implementation Recommendations:

SCP-OS (i)7 – Identify, protect, and restore historic campus open space features essential to the organizing principles of the campus plan.

SCP-OS (i)8 – Require Stanford to provide sufficient campus parks and open space in the areas designated Campus Residential, at the rate of 5 acres per 1,000 persons.

SCP-OS (i)9 – Review development applications for continued provision of recreational and athletic facilities convenient to student residences and in adequate amounts to serve student needs.

SCP-OS (i)10 – Incorporate open space in redevelopment of the core campus.

SCP-OS (i)11 – Review development applications in the Academic Campus land use designation for continued provision of buffer between development on the campus and surrounding off -campus communities.

SCP-OS (i)12 – Develop appropriate setback requirements as part of the new zoning for the Campus Residential-Low Density and Campus Residential-Moderate Density land use designations.

The Stanford Community Plan also includes guidance on lands designated Campus Open Space on the Project site within the Academic Growth Boundary; and lands designated Open Space and Field Research and Special Conservation Area, on the Project site outside the Academic Growth Boundary. See relevant policies discussed in Section 5.3, Biological Resources, and Section 5.10, Land Use and Planning, in this EIR.

County of Santa Clara Ordinances and Policies

The Santa Clara Zoning Code also addresses County jurisdiction on Project site lands based on the Stanford Community Plan, including for lands zoned Open Space and Field Research (OS/F). As discussed in Zoning Code Section 2.50.010, the OS/F zoning district was established to maintain the open space character of Stanford lands outside the Academic Growth Boundary. Allowable uses in the OS/F zone include utilities, low intensity agriculture, limited agricultural research, field research and studies, limited outdoor recreational activities, recreational trails, environmental restoration, limited ancillary facilities, and Stanford-specialized facilities, such as astronomical or related facilities.

Stanford

Stanford University Landscape Design Guidelines

The Landscape Design Guidelines, prepared by the Stanford Planning and Design Office, focus on site planning, vegetation and water management. The guidelines have two goals: 1) to help conserve the "essential elements of the Stanford landscape," and 2) to guide development as it occurs on campus. The document presents guidelines for creating an urban/rural mosaic from a broad site planning perspective down to detailed design scale. It presents guidelines for implementing design and construction of new facilities, and management of undeveloped land. Currently, Stanford's review of the adherence to the guidelines and planning for open space occurs during the development of individual projects and in coordination meetings between the Capital Planning and Management Office, University Architect/Planning Office, and Facilities Operation Units. These guidelines have not been adopted by the County or other jurisdictions containing Stanford land.

Stanford updated its Landscape Design Guidelines in February 2009, providing additional considerations focused on the preparation of plans, preferred water usage and systems, planting location, and tree and shrub protection.

Local Jurisdictions

City of Palo Alto Comprehensive Plan

The City of Palo Comprehensive Plan's Community Services and Facilities Element addresses the City's recreation and community facilities goals and policies:

Goal C-1: Effective and Efficient Delivery of Community Services.

Policy C-2 – Where economies of scale are possible, cooperate with neighboring communities in providing municipal services such as police and fire protection, libraries, and recreation.

Policy C-7 – Actively work with private, nonprofit, and public community service organizations to avoid duplication and to coordinate the delivery of services like child care, senior services, and recreation.

Policy C-26 – Maintain and enhance existing park facilities.

Program C-24 – Preserve El Camino Park as a recreational resource for the community. (El Camino Park is owned by Stanford University and is leased by the City through June 2033.[1])

Policy C-27 – Seek opportunities to develop new parks and recreation facilities to meet the growing needs of residents and employees of Palo Alto.

Goal C-5: Equal Access to Educational, Recreational, and Cultural Services for All Residents.

Policy C-32 – Provide fully accessible public facilities to all residents and visitors.

City of Menlo Park General Plan

Section II Open Space/Conservation Goals, Policies and Program of the City of Menlo Park General Plan addresses the City's Open Space goals and policies:

Goal OSC1: Maintain, Protect and Enhance Open Space and Natural Resources. Protect, conserve and enhance valuable natural resources, open areas and designated open space lands rich in scenic value, wildlife or of a fragile ecological nature through conservation and restoration efforts.

Policy OSC2.1 Open Space for Recreation Use – Provide open space lands for a variety of recreation opportunities, make improvements, construct facilities and maintain programs that incorporate sustainable practices that promote healthy living and quality of life.

Goal OSC2: Provide Parks and Recreation Facilities. Develop and maintain a parks and recreation system to provide areas and facilities conveniently located, sustainable, properly designed and well maintained to serve the recreation needs and promote healthy living of residents, workers and visitors to Menlo Park.

[1] This lease was extended nine years from June 2033 to June 2042. http://www.cityofpaloalto.org/civicax/filebank/documents/ 41789

Policy OSC2.2 Planning for Residential Recreational Needs – Work with residential developers to ensure that parks and recreational facilities planned to serve new development will be available concurrently with need.

Policy OSC2.4 Parkland Standards – Strive to maintain the standard of 5 acres of parkland per 1,000 residents.

Policy OSC2.6 Pedestrian and Bicycle Paths – Develop pedestrian and bicycle paths consistent with the recommendations of local and regional trail and bicycle route projects, including the Bay Trail.

Implementing Programs:

OSC2.A Support Regional Open Space, Conservation and Recreational Efforts – Coordinate with Mid-Peninsula Regional Park District, San Mateo County and other regional open space and conservation measures to ensure recreational opportunities at existing and future parks and trails.

O***SC2.B Evaluate Recreational Needs*** – Evaluate park facilities on a regular basis for their overall function and ability to meet recreational needs. Provide new amenities as needed and based on financial resources to support changing needs of the population and recreational trends.

5.14.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on recreation if it would:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Approach to Analysis

This analysis considers whether an increase in use of public parks and recreation facilities resulting from the proposed Project would cause the substantial physical deterioration of those facilities (e.g., damage to vegetation, accelerated wear on sports facilities and fields, or erosion along trails) or the need for new or expanded facilities the construction or operation of which would result in substantial adverse physical effects. This analysis further considers whether implementation of the proposed 2018 General Use Permit would diminish or otherwise adversely affect recreational opportunities and existing facilities in the vicinity of the Project site based on facility capacity. Construction impacts associated with the development of new on-campus park and recreational facilities considered as part of the overall Project, are identified in Section 5.2 Air Quality, 5.3 Biological Resources, 5.11 Noise and Vibration, and 5.15 Transportation and Traffic, within this EIR.

In particular, to address the first issue raised above, it is common for jurisdictions (as addressed under the Quimby Act listed above), to use an "acres of park per 1,000 residents" target to determine whether a residential project would necessitate construction of new onsite parks to serve additional residents, which in turn, could result in physical environmental effects. With respect to the anticipated increase in Stanford generated residents, this EIR both considers whether the increase in on-campus residential population anticipated to occur under the 2018 General Use Permit would result in a need for new parks or recreation facilities and whether the increase in campus residential population would result in substantial physical deterioration of neighboring off-campus park and recreation facilities.

Crowding and increased demand for public facilities and programs alone, absent physical deterioration or new construction or the alteration or displacement of existing parks or recreation facilities on campus, are not considered physical environmental impacts under CEQA.

Approach to On-Campus Impacts

To consider whether the increase in on-campus residential population would result in a need for new park and recreation facilities, this analysis considers Open Space Strategy #3 of the Stanford Community Plan, which identifies the acreage of designated Campus Open Space in the faculty/staff subdivision in relation to the faculty/staff residential population to arrive at a Campus Open Space per resident ratio. The Stanford Community Plan establishes a minimum standard of 5 acres per 1,000 population for on-campus parks and open space. This is also consistent with the methods employed by neighboring cities to determine open space adequacy (see Local Regulations*,* in the Regulatory Setting, above).

Based on these adopted policies, this analysis expands upon that provided under Open Space Implementation Recommendation SCP-SOS (i)8 of the Stanford Community Plan by comparing the number of all campus residents anticipated under the proposed 2018 General Use Permit to the total acreage of designated Campus Open Space lands to determine whether there would be at least five acres of designated Campus Open Space per 1,000 campus residents.[2]

Approach to Off-Campus Impacts

To consider off-campus impacts to parks and recreation facilities, the analysis considers the neighboring public park and recreation facilities used by Stanford campus faculty, staff and students and the potential that an increase in use of off-site facilities by this population could contribute to substantial deterioration of those facilities. To consider the increased use under the 2018 General Use Plan, this analysis used data collected by Stanford in support of its Park and Recreation Facilities Analysis, which was independently peer reviewed by ESA (Appendix REC).

Quantification of the increase in daily offsite park and recreation facility use by Stanford campus residents was based on a Sports, Fitness and Recreation Facilities Survey conducted by Stanford in Spring 2016 that documented current use of offsite public park and recreation facilities by the same

[2] Campus residents include all residents on Stanford lands within the General Use Permit boundary, including students, faculty and staff. The resident population estimates also include the spouses and children of graduate students and faculty/staff living on the campus. Refer to Section 5.12, Population for additional detail.

campus residential populations that are anticipated to grow under the proposed 2018 General Use Permit. The methodology considers park use by campus residents for three population categories: undergraduate students; graduate students; and faculty, staff and post-doctoral students.

It should be noted that Stanford also conducted a sensitivity analysis in support of its Park and Recreation Facilities Analysis that conservatively considered the additive effect of any incidental use of nearby parks and recreation facilities associated with an increase in Stanford commuters that would occur under the Project (including faculty, staff, students and other population segments who do not live on campus). Even under this additional conservative assumption, the inclusion of commuters did not change the conclusions of the analysis. Please also refer to Section 6.4 in Chapter 6, Other CEQA Issues, for a discussion of potential growth inducing effects of the Project associated with the increase in off-site population in students, faculty, staff and other workers.

Survey responses, by population segment, were used to predict the level of increased park and recreation facility usage from growth in future campus residents anticipated under the 2018 General Use Permit. The survey showed that a total of 11 percent of campus residents responded that they visited at least one public park or recreation facility in Palo Alto at least monthly, and 5 percent responded that they visited at least one public park or recreation facility in Menlo Park at least monthly.

Stanford used the survey responses to determine rates of "daily visits" and "daily visits per acre" by the campus resident population categories. Those rates were then applied to the increase in campus resident population that would occur under the proposed 2018 General Use Permit.[3] The estimated increase in daily visits, and daily visits per acre, were estimated at each study public park and recreation facility.

In order to determine the magnitude of deterioration that could result from increased usage under implementation of the proposed 2018 General Use Permit, the Park and Recreation Facilities Analysis considered turf lifespans and maintenance guidelines for both artificial and natural turf to identify the most sensitive thresholds in light of the fact that nearby facilities consist of a mix of amenities in addition to turf. Based on this investigation, it was found that the City of Palo Alto identifies artificial turf as having a lifespan of eight to ten years, whereas the National Park Service identifies greater sensitivity for analysis of natural turf in its Turf Management Operations and Maintenance Guide for the Mall in Washington, D.C.[4] (City of Palo Alto, 2016; National Park Service, 2012). This analysis used this Guide to develop a conservative screening

[3] Any spouses of graduate students were assumed to have the same behavior as the primary Stanford affiliate and were factored into the projected visits.

[4] Under the Turf Management Operations and Maintenance Guide for the Mall in Washington, D.C., requirements to protect turf are outlined, as measured in 1.5- to 2-acre turf areas, or panels. The Guide includes qualitative and quantitative turf protection and maintenance strategies, including post-event restoration, as events have the potential to deteriorate the turf in excess of normal operating procedures and casual public use of the turf areas. The Guide defines a "minor event" as less than 25 attendees at a 2-acre panel, with no turf covering or structures. Under most conditions minor events require no additional recovery time for the turf (heavy rain and frost can lead to closure of turf areas for all users). By contrast, events with 26 to 999 attendees at a panel require three to five days of turf recovery. According to the Guide, the turf and soil system used at the Mall is similar to that used on professional sports fields. Therefore, these guidelines may be applied to both nearby parks and sports fields.

threshold for physical deterioration from increased park use at an increase of 25 daily visits per two acres of parkland, or 12.5 daily visits per acre (Appendix REC, p. 16.12).[5]

Based on this screening threshold, if growth in campus residents under the proposed 2018 General Use Permit was found to result in more than 12.5 daily visits per acre at a particular public park or recreation facility, additional site specific analysis would be performed to determine whether the increase in visitors might require replacement of turf or other recreation facilities substantially in advance of their expected life cycles. An increase of less than 12.5 daily visits per acre a particular park or recreation facility would indicate that substantial deterioration from increased use by campus residents would be highly unlikely.

Impact Evaluation

Construction and Operational Impacts

The types of physical deterioration considered in the significance criteria would result only after repetitive use. Thus, project impacts on public park and recreation resources would occur through ongoing activities of the population associated with operation of development allowed under the proposed 2018 General Use Permit. Because construction workers and other temporary employees are not associated with long-term use of public park and recreation resources, there would be less potential for Project construction to affect such resources. Therefore consideration of construction and operational impacts are combined in the following analyses.

Impact 5.14-1: The Project would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Less than Significant*)

The proposed 2018 General Use Permit would increase the on-campus residential population, which would increase demand for recreation facilities and open space. The development of new academic, academic support, and housing uses that would be developed on the Project site under the 2018 General Use Permit would include the development of new recreation facilities, as well as the relocation or replacement of certain on-site recreation facilities.

This following analysis takes into consideration whether the increased on-campus residential population would create a need for new parks as well as whether the increased population would result in significant physical impacts to parks, recreational facilities and open space off-campus in the surrounding community where campus residents could likely visit. Per CEQA Guidelines Appendix G, the analysis is focused on whether "substantial physical deterioration of the facility would occur or be accelerated."

[5] This screening threshold is conservative for application to turf areas given that public park and recreation facility usage likely would be spread out over the course of the day, such that 12.5 daily visits might equate to only a few visitors at any one time, and visitors may be using different turf areas, as well as other non-turf facilities within the park, such as pathways, play structures and tennis courts. The screening threshold is also extremely conservative for application to equipment and infrastructure, as such facilities would be less susceptible to substantial deterioration from increased use than natural turf.

Substantial deterioration may be defined as a condition requiring replacement or major repairs. This could refer to the replacement of artificial or natural turf or playground equipment and park infrastructure. Increased use by campus residents could result in the substantial physical deterioration of public park and recreation facilities if the increased use would necessitate turf, equipment or infrastructure to be replaced substantially ahead of their expected lifecycles. This analysis focuses on the deterioration of turf as a screening threshold, as such deterioration is more likely to be immediate and visible, and is therefore a more conservative threshold to apply, compared to the deterioration of hardscape and equipment in a park.

On-Campus Park and Recreational Facility Deterioration

Under the 2018 General Use Permit, the location and amount (265 acres) of land designated as Campus Open Space in the Stanford Community Plan on the Project site would not change from baseline conditions. **Table 5.14-3**, below, demonstrates that the lands designated Campus Open Space on the Project site would provide adequate space to support the estimated campus residents under baseline conditions and under the proposed 2018 General Use Permit, with well more than five acres of designated Campus Open Space per 1,000 campus residents. Based on the availability of Campus Open Space, the 2018 General Use Permit would not result in overuse that could lead to substantial degradation of parks and recreation facilities and would not create a need for construction of new onsite park, recreation and open space facilities.

TABLE 5.14-3
STANFORD CAMPUS OPEN SPACE ACREAGE PER RESIDENT

	Fall 2018	Fall 2035
Campus resident population	15,338	21,664
Designated Campus Open Space (approximate)	265	265
Ratio (acres per 1,000 residents, approximate)	17.3	12.2

SOURCE: Stanford, *Park and Recreation Facilities Analysis,* 2017 (Refer to Appendix REC)

Additionally, while the lands designated Campus Open Space on the Project site would be sufficient to support the campus residential population anticipated under the 2018 General Use Permit, Stanford may use a portion of the net new square footage authorized for academic and academic support uses to construct new recreation facilities, as occurred under the 2000 General Use Permit. As discussed in the Setting, under the 2000 General Use Permit, Stanford relocated or replaced some of its existing recreation facilities, and also used about 290,000 square feet (approximately 14 percent of its authorized net new academic and academic support square footage) for new and expanded athletic and recreation facilities. Under the 2018 General Use Permit, Stanford may relocate or replace some of its existing campus recreation facilities, and use a portion of its net new academic and academic support square footage for new or expanded athletic and recreation facilities (Appendix REC). This would contribute to added park and recreation facilities to serve the campus population.

Off-Campus Park and Recreational Facility Deterioration

As addressed under the Existing Setting, none of the public park or recreation facilities were observed to be substantially deteriorated under existing uses. Cyclical maintenance upgrades are included in the capital budget programs, and the public park and recreation facilities appear to be well-maintained. Based on the methodology addressed under Approach to Off-Campus Impacts, above, in order to assess impacts to off-campus public park and recreation facilities generated by the increased population under the 2018 General Use Permit this analysis considers if the associated growth in on-campus residents would result in an increase of more than 12.5 daily visits per acre at any particular public park or recreation facility. An increase of less than 12.5 daily visits per acre a particular park or recreation facility would indicate that substantial deterioration from increased use by campus residents would be highly unlikely.

Table 5.14-4 presents the estimated increase in usage in public park and recreation facilities in Palo Alto and Menlo Park by campus residents under the proposed 2018 General Use Permit under the survey conducted and addresses under methodology above. As shown in Table 5.14-4, no public park would experience an increase over the screening threshold of 12.5 daily visits per acre. Therefore, the 2018 General Use Permit would not result in significant deterioration of public park and recreation facilities.

Based on review of the descriptions of public park and recreation facilities in municipal documents, none of the public park or recreation facilities were identified as substantially deteriorated. Cyclical maintenance upgrades were included in the capital budget programs, and the public park and recreation facilities appear to be well-maintained.

Stanford staff also visited each of these public park and recreation facilities for a visual assessment. None of the parks appeared to be substantially deteriorated. However, there was widespread browning of natural turf likely associated with the current, prolonged drought. City documents and local news sources confirm that both Palo Alto and Menlo Park have reduced watering turf and planted areas, except for formal sports fields. This suggests that that the effects of the prolonged drought and the reduction in watering may have contributed to limited deterioration in the condition of certain parks. There was no documentation that substantial deterioration is occurring due to an increase in visitors.

Conclusion

Based on the Project description and analysis conducted, Stanford is expected to provide adequate on-campus sports, fitness and recreation facilities for faculty, staff and students under the proposed 2018 General Use Permit. New and expanded indoor recreation facilities would be authorized as needed as part of the academic and academic support space authorized by the General Use Permit. This analysis conducted also demonstrates that there would not be substantial deterioration of public park and recreation facilities associated with increased visitors to those facilities from campus residents under the proposed 2018 General Use Permit. Consequently, the proposed 2018 General Permit would generate a less-than-significant impact to public park and recreation resources.

Mitigation: None required.

TABLE 5.14-4
ESTIMATED INCREASE IN USAGE IN PUBLIC PARK AND RECREATION FACILITIES BY ON-CAMPUS RESIDENTS UNDER THE PROPOSED 2018 GENERAL USE PERMIT

Figure Reference	Name	Acres[a]	Growth in Daily Visits	Daily Visits per Acre
PALO ALTO				
Regional/District Parks				
1	Foothills Park/Open Space Preserve	Total 1,400; Active 26.7	41	0.0; 1.5
2	Baylands Nature Preserve	Total 1,940; Active 9.2	32	0.0; 3.5
3	Pearson-Arastradero Preserve	Total 622; Active 6.2	27	0.0; 4.4
Neighborhood Parks and Recreation Facilities				
4	Neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks)	4.4	37	8.4
5	Mayfield (Stanford-Palo Alto) playing fields	5.9	16	2.7
6	El Camino Park	12.2	16	1.3
7	Baylands Athletic Center fields	10.0	7	0.7
8	Heritage Park	2.01	7	3.5
9	Rinconada Pool	NA	5	NA
10	Mitchell Park	21.4	4	0.2
11	Peers Park	4.7	6	1.3
12	Lawn Bowling Green	1.9	2	1.1
13	Avenidas Senior Center	NA	2	NA
14	Cubberley Community Center	NA	5	NA
MENLO PARK				
Regional/District Parks				
15	Bedwell Bayfront Park	Total 160; Active 7.0	1	0.0; 0.1
Neighborhood Park and Recreation Facilities				
16	Civic Center recreation facilities	9.3	14	1.5
17	Stanford Hills Park	3.1	12	3.9
18	Sharon Park	9.8	5	0.5
19	Sharon Hills Park	11.5	5	0.4
20	Nealon Park	9.0	4	0.4
21	Jack W. Lyle Park	4.6	3	0.7

[a] Figure references are associated with recreation facilities shown on Figure 5.14-2.
[b] Acreages of all parks were obtained from Palo Alto or Menlo Park City websites and documents, except for Sharon Hills Park, which was calculated by Stanford. Please see Appendix BCR in this EIR for calculations on "actively used" park areas for regional/district parks.

SOURCE: Stanford, *Park and Recreation Facilities Analysis,* 2017. (Refer to Appendix REC)

While no public park is expected to experience substantial deterioration as a result of the proposed 2018 General Use Permit, Stanford recognizes that increased daily visits from the campus residents to the four College Terrace parks would be higher than the increase that would be experienced at other neighborhood parks, due to the proximity of these parks to the residential areas of the campus. Stanford also recognizes that small neighborhood parks are not managed by reservation systems or other controls, and that increased visitors to those parks could result in some additional maintenance costs. Therefore, Stanford voluntarily offers as an Improvement Measure park upgrade funds specific to the four College Terrace parks.

> **Improvement Measure 5.14-1:** Stanford has proposed to provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs previously identified by the City of Palo Alto (approximately $300,000) to provide for planned park upgrades and ensure that the four College Terrace parks remain in good condition. These improvements identified in the Palo Alto Capital Budget were as follows:
>
> - Tennis court upgrade ($215,000 planned for both Terman Park and Weisshaar Park, this good-neighbor offer assumes $140,000 is for Weisshaar Park), planned for FY 2021.
>
> - Planned infrastructure improvements to upgrade and renovate safety and accessibility of the playground and other features in Cameron Park, approximately $160,000, planned for FY 2020.

Impact 5.14-2: The construction of recreational facilities under the proposed Project would cause physical effects on the environment. (*Significant*)

Construction and operation of development pursuant to the proposed 2018 General Use Permit would lead to temporary and long-term increases in population, respectively. As discussed above, under Impact 5.14-1, as occurred under the 2000 General Use Permit, under the proposed 2018 General Use Permit, Stanford would likely relocate or replace some of its existing campus recreation facilities, and would use a portion of authorized net new academic and academic support square footage for new or expanded athletic and recreation facilities.

The creation of new open spaces and construction of recreational amenities on the Project site would result in physical effects. These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. Since on-campus recreational improvements are part of the overall anticipated development program under the 2018 General Use Permit, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses in other sections of this EIR, including Section 5.2 Air Quality, 5.3 Biological Resources, 5.8 Hazardous Materials, 5.9 Hydrology and Water Quality, 5.11 Noise and Vibration, and 5.15 Transportation and Traffic. Mitigation measures outlined in their respective sections to reduce construction related impacts would similarly apply to on-campus park and recreation facility development.

Mitigation: Implement the following mitigation measures, as needed for construction of recreation facilities:

Air Quality

Mitigation Measure 5.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 5.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 5.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 5.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 5.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 5.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 5.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 5.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees during construction.*

Hazardous Materials

Mitigation Measure 5.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 5.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 5.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 5.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 5.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 5.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 5.14-3: The Project in combination with past, present, and reasonably foreseeable future projects would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Less than Significant*)

The geographic area for the cumulative analysis of public park and recreation facilities is focused on facilities on campus and those within three miles of the Project site. The increased demand by the Project on public park and recreation facilities (as identified under Impact 5.14-1 above), would be coupled with that generated by the increased populations of the Cities of Menlo Park and Palo Alto. Therefore, the scope of past, present and future projects included in the cumulative analysis is focused on build-out populations of the neighboring city general plans for which the nearby parks are managed, that being the City of Palo Alto and the City of Menlo Park.

Under its Comprehensive Plan Update, the City of Palo Alto considered its local City and sphere of influence population increase from 2014 to 2030 would be up to 21 percent. Palo Alto's Comprehensive Plan Update Supplement to the Draft EIR considers this population increase and concluded that cumulative impacts to parks and recreation facilities would be less that significant through compliance with the City's Municipal Code which would ensure that in-lieu fees and impact fees are collected for the creation of new or physically altered parks and recreational facilities to the extent feasible (City of Palo Alto, 2017). Similarly, the City of Menlo Park's 2016 update of its Land Use Element identified a 24-year population growth of nearly 53 percent by 2040. Evaluation of cumulative impacts to parks also concluded that conformity with General Plan goals and polices would ensure that adequate parklands and recreational facilities would be provided (City of Menlo Park, 2016).

Ultimately, while there is expected to be a cumulative population increase in the Project area, this growth is not expected to generate a cumulative significant impact to park and recreation facilities with the use of established municipal fee structures of the local jurisdictions. Additionally, the Project is identified to generate a less-than-significant impact to deterioration of both on- and off-campus park and recreation facilities. Furthermore, Stanford has identified as a recommended improvement measure to provide a onetime contribution equivalent to capital budget needs previously identified by the City of Palo Alto to ensure park improvements are provided at the four College Terrace parks. Given all these factors, there is no cumulatively considerable impact identified to park and recreation facilities.

Mitigation: None required.

5.14.6 References

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5.15 Transportation and Traffic

5.15.1 Introduction

This section addresses the potential for implementation of the proposed 2018 General Use Permit to result in significant transportation and traffic impacts. The section includes a description of the existing and 2018 baseline environmental transportation settings and presents a discussion of applicable federal, State, and County regulations. The section addresses the impacts of the proposed 2018 General Use Permit on the surrounding transportation system, including critical study intersections, freeway segments and ramps, and neighborhood streets; transit service; bicycle and pedestrian facilities; safety and emergency access; and vehicle miles traveled. The section also includes information regarding transit and bicycle facility capacity; and on-campus parking supply and off-campus programs to limit parking in the community. Mitigation measures are identified to reduce potential impacts to less-than-significant levels where feasible. The section relies in part on four technical reports prepared by Stanford in support of the proposed 2018 General Use Permit: (1) a Transportation Impact Analysis (TIA) (see Appendix TIA-REV); (2) a Vehicle Miles Traveled (VMT) Analysis (see Appendix VMT); a Transit and Bicycle Facility Analysis and Addendum (see Appendix TBC and Appendix TBC-ADD); and a Parking Analysis (see Appendix PKG). The TIA and VMT technical reports were prepared by Fehr and Peers in support of the proposed 2018 General Use Permit and were independently peer reviewed by ESA and AECOM. The Transit and Bicycle Facility Analysis was prepared by Arup in support of the proposed 2018 General Use Permit and was independently peer reviewed by ESA. The Parking Analysis was prepared by Stanford in support of the proposed 2018 General Use Permit and was also independently peer reviewed by ESA.

Legal Requirements in Transition

The Transportation Impact Assessment is the study that typically is prepared to assess traffic impacts of development projects and to identify physical improvements to increase the capacity of roadways, intersections and other transportation infrastructure affected by the project. The Transportation Impact Assessment is prepared based on guidelines published by the Valley Transportation Authority. Because this type of study is concerned with road capacity, it focuses on the highest, or peak, impacts that are predicted to occur and identifies mitigation measures to increase maximum road capacity.

Traditionally, Transportation Impact Assessments under CEQA have focused on level of service analyses. In contrast, a VMT Analysis evaluates vehicle trips made throughout the day, and focuses on the number and length of vehicle trips made by project employees and residents. Measures to reduce VMT include locating a project near major transit stops and high-quality transit corridors, improving bicycle and pedestrian facilities, and instituting programs to encourage travel by modes other than driving alone. Rather than increasing road capacity, a VMT analysis focuses on getting people out of their cars.

In 2013, California enacted a law (SB 743) that, among other things, directed the State Office of Planning and Research (OPR) to develop new CEQA Guidelines for analyzing significant

transportation impacts within transit priority areas[1] that focus on vehicle miles traveled, trip generation rates, and similar measures that promote the reduction of greenhouse gas emissions (PRC section 21099(b)(1)). After the new CEQA Guidelines take effect, "automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant effect on the environment" except in areas where the revised CEQA Guidelines so provide (PRC section 21099(b)(2)). OPR has issued draft CEQA Guidelines in response to SB 743, but those amendments have not been finalized or adopted.

Because the legal context for evaluating transportation impacts is in transition, both a Transportation Impact Analysis and a VMT Analysis have been prepared for the proposed 2018 General Use Permit. The County has not yet removed its congestion-based level of service criteria from its CEQA significance standards, so the traditional congestion-based approach to evaluating traffic impacts is still needed. However, a VMT-based approach will likely be required by State law during most of the time that the 2018 General Use Permit is in effect. Thus, a VMT analysis has also been included in this Program EIR to more fully describe the proposed Project's impacts and to better enable the County to continue to rely on this Program EIR in the future when it reviews and evaluates individual projects implementing the 2018 General Use Permit.

Bases for Analysis

The following analysis scenarios are presented to determine Project impacts:

- 2016 Existing Conditions;
- 2018 Baseline Conditions: Year 2018 with the completion of development authorized under the 2000 General Use Permit [with the exception of Escondido Village (EV) Graduate Residences, which will not be occupied by 2018] and other local approved projects that would be built and fully occupied by Fall 2018;
- 2018 Baseline with Project Conditions: 2018 Baseline Conditions with full buildout of the proposed 2018 General Use Permit;
- 2035 Cumulative Conditions: Year 2035 with the completion of development authorized under the 2000 General Use Permit (including EV Graduate Residences), background growth and reasonably foreseeable projects; and
- 2035 Cumulative with Project Conditions: 2035 Cumulative Conditions with full buildout of the proposed 2018 General Use Permit.

The Stanford Community Plan establishes a standard for the Stanford campus of "No Net New Commute Trips" (specifically applied to vehicle trips in the peak hour and peak direction) compared to measured baseline conditions. To date, Stanford has achieved this standard each year

[1] Transit priority areas are areas within ½-mile of an existing or planned major transit stop (PRC section 21099(a)(7)). A "major transit stop" is a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (PRC section 21064.3).

through a combination of onsite trip reduction programs and offsite programs that have removed trips from the roads nearest to the campus.

In its Project application, Stanford has committed to continue to implement programs to achieve the No Net New Commute Trips standard during the remainder of the 2000 General Use Permit, and to expand those programs throughout the life of the proposed 2018 General Use Permit. However, to provide a conservative analysis similar to the analysis performed for the 2000 General Use Permit, this analysis assumes that Stanford does not increase its trip reduction efforts beyond the existing programs, and that growth in trips would occur with both the remaining development authorized under the 2000 General Use Permit and with buildout of the proposed 2018 General Use Permit.

5.15.2 Existing Environmental Setting

Primary regional automobile access to the Project site is provided by US Route 101 (US 101), Interstate 280 (I-280), and El Camino Real (State Route [SR] 82). Major arterials in the area include Junipero Serra Boulevard – Foothill Expressway, University Avenue – Palm Drive, Embarcadero Road – Galvez Street, Sand Hill Road, and Page Mill Road – Oregon Expressway. These roadways are described below and illustrated on **Figure 5.15-1**.

Regional Setting

US 101 (Bayshore Freeway) is an eight- to ten-lane freeway that runs from east San Jose to San Francisco along the west side of San Francisco Bay, connecting communities along the Peninsula. One or two High Occupancy Vehicle (HOV) lanes operate in both directions during extended morning and afternoon commute periods south of Whipple Avenue. Access to the Project site from US 101 is primarily provided via University Avenue and Embarcadero Road.

I-280 (Junipero Serra Freeway) is an eight-lane freeway that connects San Jose and San Francisco, east of the Santa Cruz Mountains. I-280 has interchanges serving Stanford at Sand Hill Road, Alpine Road, and Page Mill Road. One HOV lane operates in both directions during extended morning and afternoon commute periods south of Magdalena Avenue.

El Camino Real (SR 82) is a state highway that runs from San Francisco to San Jose. In the study area, El Camino Real is a six-lane road south of Ravenswood Avenue, and a four-lane divided road from Ravenswood Avenue north to the Atherton border. El Camino Real parallels US 101 and I- 280. The major intersections within the study area are controlled by traffic signals, with the exception of the El Camino Real / Palm Drive / University Avenue interchange. This interchange is grade-separated and diamond-configured. The exit and entrance ramps at the interchange are controlled by traffic signals. In the City of Palo Alto's Comprehensive Plan, El Camino Real is classified as an arterial.

Local Setting

Junipero Serra Boulevard/Foothill Expressway is a two- to four-lane roadway that runs parallel to I-280 from Alpine Road to Page Mill Road as a two-lane undivided road, at which point it widens to a four-lane divided road, signed as Foothill Expressway. Junipero Serra Boulevard forms a portion of the southwesterly boundary of the Stanford central campus. Junipero Serra Boulevard and Foothill Expressway are County-maintained roads.

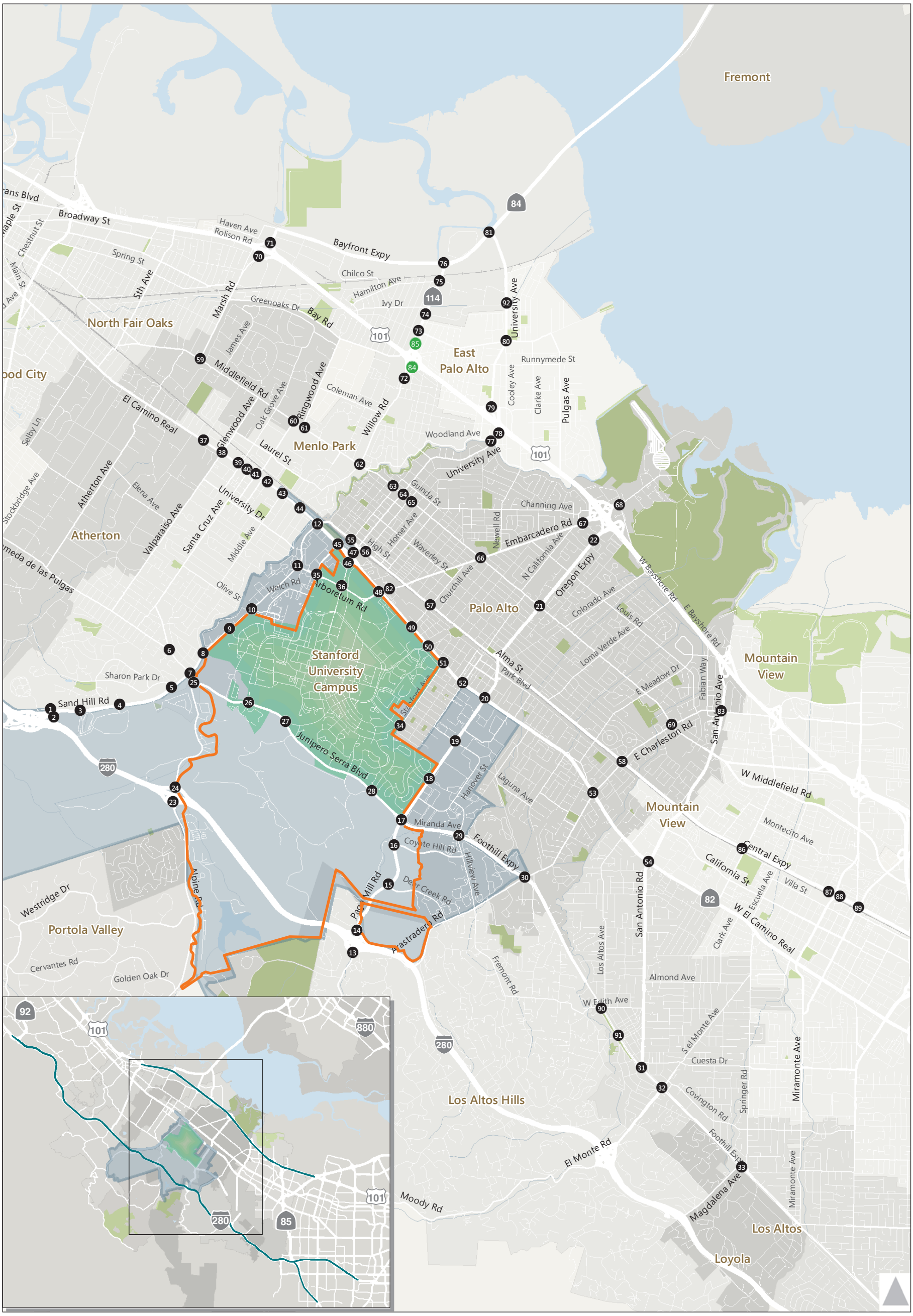
University Avenue/Palm Drive is a two- to four-lane road that runs from the Dumbarton Bridge (SR 84) to the El Camino Real grade-separated interchange, where it becomes Palm Drive. From SR 84 to US 101, University Avenue is a four-lane arterial within the cities of Menlo Park and East Palo Alto. South of US 101, in the City of Palo Alto, University Avenue is a two-lane arterial. Near the Caltrain overcrossing, University Avenue widens to four lanes. Palm Drive has four lanes until the intersection with Arboretum Road where it narrows to three lanes. At Campus Drive West, Palm Drive narrows again to two lanes until it terminates at the Stanford Main Quad. Within Palo Alto, University Avenue is classified as an arterial between El Camino Real and Middlefield Road, and a residential arterial between Middlefield Road and the City boundary. Within East Palo Alto, University Avenue is classified as an arterial.

Embarcadero Road/Galvez Street is a four-lane arterial that runs from the intersection of El Camino Real through the US 101 interchange, terminating near the Palo Alto Municipal Airport. West of El Camino Real, Embarcadero Road becomes Galvez Street, which provides a link to Arboretum Road and Campus Drive on the Stanford campus. A short segment of Embarcadero Road underneath the Caltrain tracks is narrowed to three lanes. Within Palo Alto, Embarcadero Road is classified as a residential arterial.

Sand Hill Road is a two- to four-lane arterial that runs from Portola Road in the Town of Woodside to El Camino Real near the Stanford Shopping Center in the City of Palo Alto. Sand Hill Road is a two-lane road from Portola Road to the I-280 interchange, then it widens to four lanes to Arboretum Road, and then narrows to a two-lane road until it terminates adjacent to the Stanford Shopping Center at El Camino Real (SR 82). Within the study area, Sand Hill Road provides connections to the cities of Menlo Park and Palo Alto, as well as access to Stanford. Within Palo Alto, Sand Hill Road is classified as an arterial.

Page Mill Road/Oregon Expressway is a two- to four-lane arterial which runs from Skyline Boulevard (SR 35) to Alma Street in Palo Alto, where it becomes Oregon Expressway, and continues east to terminate at US 101. From I-280 to Alma Street, Page Mill Road is Santa Clara County Road G3. From Skyline Boulevard to the I-280 interchange, Page Mill Road is a narrow winding two-lane road. From I-280 to US 101, Page Mill Road/Oregon Expressway is a four-lane divided road. Within Palo Alto, Page Mill Road is classified as an arterial.

Access to the campus is provided by sixteen “gateway” roadways ranging from two to four lanes (see **Figure 5.15-2**).

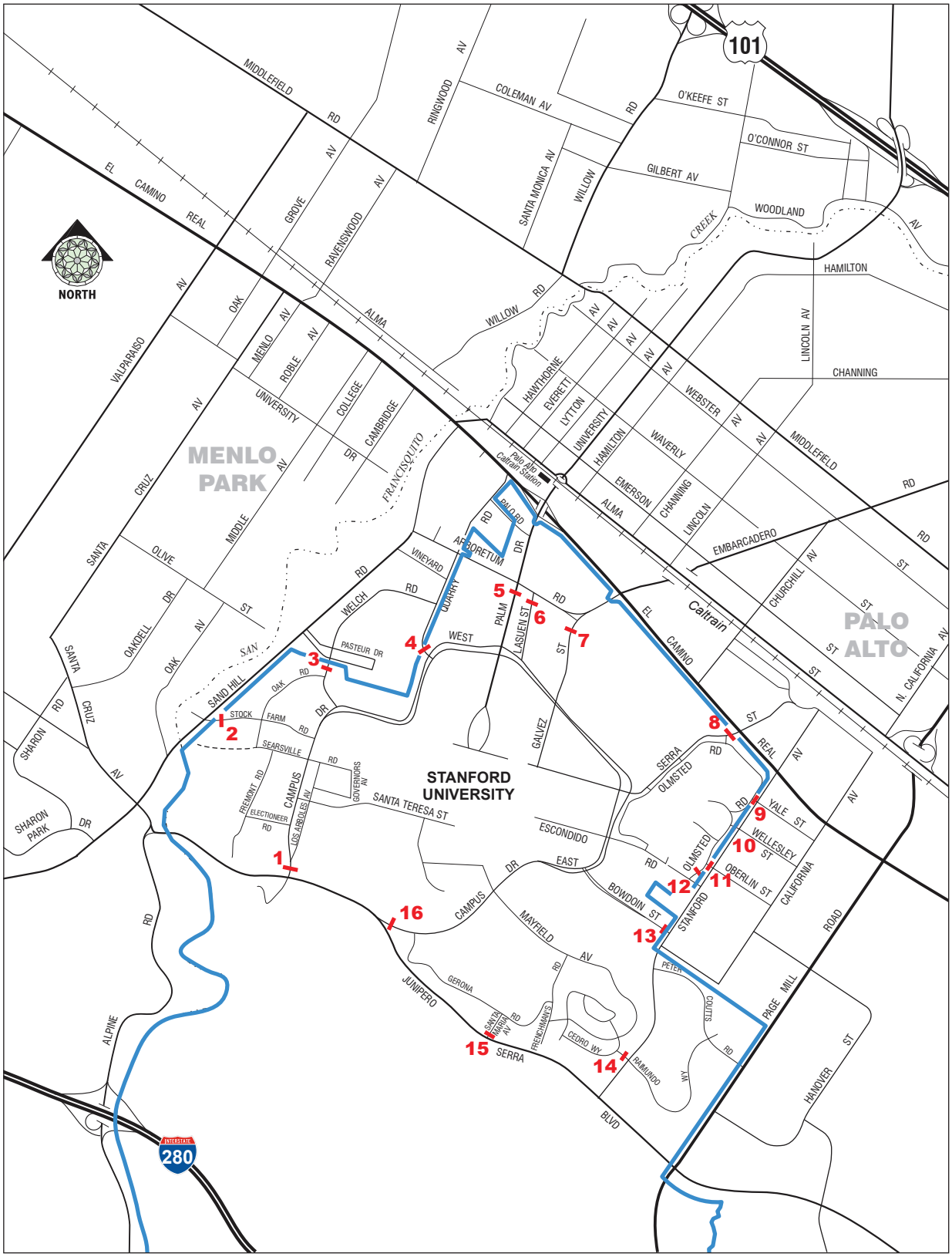


SOURCE: Fehr & Peers

Stanford 2018 General Use Permit . 160531

Figure 5.15-1
Study Intersections and Freeways

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SOURCE: AECOM Stanford University Traffic Monitoring Report; Fehr & Peers

Stanford 2018 General Use Permit . 160531

Figure 5.15-2
Stanford University Campus Gateways

Traffic Study Area

For analysis of potential impacts of the proposed Project based on the traditional congestion-based methodology used in the Transportation Impact Analysis (TIA), study intersections, freeway segments, and freeway ramps were selected by identifying locations where the Project would contribute a noticeable amount of traffic, using a three-step screening process summarized below (a detailed description is provided in Section 1.2.1 of the TIA in Appendix TIA-REV).

Methodology for Identifying Intersections for Study

Step 1: Project-related trips were assigned to the roadways that provide access to the Project site based on the estimated Project trip generation and distribution. The Santa Clara Valley Transportation Authority[2] (VTA) Guidelines recommend using a threshold of 10 or more new trips per lane to determine if an intersection should be included in a TIA. The resulting 125 intersections were then screened using a point system that considered key characteristics of each intersection including: if the intersection is on a state or regional transportation facility; proximity to campus/concentration of trips; type of cross-street traffic and access provided; and whether the intersection was previously studied in Stanford-related traffic studies. The point system is based upon professional judgment and incorporates typical factors that traffic engineers take into account to identify those intersections most likely to influence overall traffic flow and congestion within a local setting. This refinement resulted in *initial* identification of 79 study intersections.

Step 2: The 79 study intersections and selection criteria were circulated to the County, City of Palo Alto, City of East Palo Alto, and City of Menlo Park for review and feedback. Each jurisdiction requested at least one study intersection be added for inclusion in the traffic study.

Step 3: Each of the additional intersections requested by the jurisdictions was evaluated using the above-described Step 1, and additional weight was given to inclusion of the intersection based on the local knowledge of the relevant agency staff. If the intersection then met the minimum number of points to warrant evaluation, it was included as a study intersection. Intersections that did not meet the 10 trips per lane guideline or that otherwise did not meet the numeric screening criteria with additional weighting were removed from further evaluation. Based on the above evaluation process, 13 more intersections were identified for inclusion in the analysis, including two future intersections that will be built as part of the Willow Road interchange (starting in 2019). Three intersections requested by the City of East Palo Alto were included because they recently were studied in the Facebook Campus Expansion Environmental Impact Report, even those they did not meet the study intersection selection criteria. A list of the final 95 study intersections is provided in **Table 5.15-1** and Figure 5.15-1.

[2] The Santa Clara Valley Transportation Authority is the congestion management agency of Santa Clara County.

TABLE 5.15-1
STUDY INTERSECTIONS

ID No.	Intersection	Jurisdiction (CMP Network)[a]
1	I-280 Northbound On-Ramp / Sand Hill Road	Menlo Park
2	I-280 Northbound Off-Ramp / Sand Hill Road	Menlo Park
3	Addison Wesley / Sand Hill Road	Menlo Park
4	Saga Lane / Sand Hill Road	Menlo Park
5	Sharon Park Drive / Sand Hill Road	Menlo Park
6	Alameda de las Pulgas / Santa Cruz Avenue	San Mateo County
7	Santa Cruz Avenue / Sand Hill Road	Menlo Park
8	Oak Avenue / Sand Hill Road	Menlo Park
9	Stock Farm Road / Sand Hill Road	Palo Alto
10	Pasteur Drive / Sand Hill Road	Palo Alto
11	Arboretum Road / Sand Hill Road	Palo Alto
12	El Camino Real / Sand Hill Road	Palo Alto (SC CMP)
13	I-280 Southbound Ramps / Page Mill Road*	Santa Clara County
14	I-280 Northbound Ramps / Page Mill Road*	Santa Clara County
15	Deer Creek Road / Page Mill Road	Santa Clara County
16	Coyote Hill Road / Page Mill Road	Santa Clara County
17	Junipero Serra Blvd - Foothill Expressway / Page Mill Road	Santa Clara County (SC CMP)
18	Peter Coutts / Page Mill Road	Santa Clara County
19	Hanover Street / Page Mill Road	Santa Clara County (SC CMP)
20	El Camino Real / Page Mill Road - Oregon Expressway	Santa Clara County (SC CMP)
21	Middlefield Road / Oregon Expressway	Santa Clara County (SC CMP)
22	Oregon Expressway / West Bayshore Road	Santa Clara County
23	I-280 Southbound Ramps / Alpine Road*	San Mateo County
24	I-280 Northbound Ramps / Alpine Road*	San Mateo County
25	Junipero Serra Blvd / Alpine Road	Menlo Park
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County
28	Junipero Serra Blvd / Stanford Avenue	Santa Clara County
29	Foothill Expressway / Hillview Avenue	Santa Clara County
30	Foothill Expressway / Arastradero Road	Santa Clara County (SC CMP)
31	Foothill Expressway / San Antonio Road	Santa Clara County (SC CMP)
32	Foothill Expressway / El Monte Avenue	Santa Clara County (SC CMP)
33	Foothill Expressway / Springer Road-Magdalena Avenue	Santa Clara County (SC CMP)
34	Bowdoin Street / Stanford Avenue*	Palo Alto
35	Arboretum Road / Quarry Road	Palo Alto
36	Arboretum Road / Palm Drive	Palo Alto
37	El Camino Real / Encinal Avenue	Menlo Park
38	El Camino Real / Valparaiso Avenue	Menlo Park

TABLE 5.15-1 (CONTINUED)
STUDY INTERSECTIONS

ID No.	Intersection	Jurisdiction (CMP Network)[a]
39	El Camino Real / Oak Grove Avenue	Menlo Park
40	El Camino Real / Santa Cruz Avenue	Menlo Park
41	El Camino Real / Ravenswood Road	Menlo Park
42	El Camino Real / Roble Avenue	Menlo Park
43	El Camino Real / Middle Avenue	Menlo Park
44	El Camino Real / Cambridge Avenue	Menlo Park
45	El Camino Real / Quarry Road	Palo Alto
46	El Camino Real (Southbound) / University Avenue	Palo Alto (SC CMP)
47	El Camino Real (Northbound) / University Avenue	Palo Alto (SC CMP)
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)
49	El Camino Real / Churchill Avenue	Palo Alto
50	El Camino Real / Serra Street	Palo Alto
51	El Camino Real / Stanford Avenue	Palo Alto
52	El Camino Real / California Avenue	Palo Alto
53	El Camino Real / Arastradero Road - Charleston Road	Palo Alto (SC CMP)
54	El Camino Real / San Antonio Road	Mountain View (SC CMP)
55	Alma Street / Lytton Avenue	Palo Alto
56	Alma Street / Hamilton Avenue	Palo Alto
57	Alma Street / Churchill Avenue	Palo Alto
58	Alma Street / Charleston Road	Palo Alto
59	Middlefield Road / Marsh Road	Atherton
60	Middlefield Road / Ravenswood Avenue	Menlo Park
61	Middlefield Road / Ringwood Avenue	Menlo Park
62	Middlefield Road / Willow Road	Menlo Park
63	Middlefield Road / Lytton Avenue	Palo Alto
64	Middlefield Road / University Avenue	Palo Alto
65	Middlefield Road / Hamilton Avenue	Palo Alto
66	Middlefield Road / Embarcadero Road	Palo Alto
67	Saint Francis Drive / Embarcadero Road	Palo Alto
68	E. Bayshore Road / Embarcadero Road	Palo Alto
69	Middlefield Road / Charleston Road	Palo Alto
70	US 101 Southbound Ramps / Marsh Road	Menlo Park
71	US 101 Northbound Ramps / Marsh Road	Menlo Park
72	Bay Road / Willow Road	Menlo Park
73	Newbridge Street / Willow Road	Menlo Park
74	O'Brien Drive / Willow Road	Menlo Park
75	Hamilton Avenue / Willow Road	Menlo Park
76	Bayfront Expressway / Willow Road	Menlo Park (SM CMP)

TABLE 5.15-1 (CONTINUED)
STUDY INTERSECTIONS

ID No.	Intersection	Jurisdiction (CMP Network)[a]
77	Woodland Avenue / University Avenue	East Palo Alto
78	US 101 Southbound Ramps / University Avenue	East Palo Alto
79	Donohoe Street / University Avenue	East Palo Alto
80	University Avenue / Bay Road	East Palo Alto
81	University Avenue / Bayfront Expressway	Menlo Park (SM CMP)
82	Town & Country Driveway / Embarcadero Road	Palo Alto
83	Charleston Road / San Antonio Road	Palo Alto (SC CMP)
84	US 101 Southbound Ramps / Willow Road	Menlo Park
85	US 101 Northbound Ramps / Willow Road	Menlo Park
86	Central Expressway / Rengstorff Avenue	Santa Clara County (SC CMP)
87	Central Expressway / Shoreline Boulevard (N)	Santa Clara County (SC CMP)
88	Central Expressway / Shoreline Boulevard (S)	Santa Clara County (SC CMP)
89	Central Expressway / Moffett Boulevard	Santa Clara County (SC CMP)
90	Foothill Expressway / Edith Avenue	Santa Clara County
91	Foothill Expressway / Main Street	Santa Clara County (SC CMP)
92	University Avenue / O'Brien Drive	Menlo Park
93	University Avenue / Adams Drive*	Menlo Park
94	University Avenue / Runnymede Street	East Palo Alto
95	University Avenue / Bell Street	East Palo Alto

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections.
(SC CMP) = CMP intersection in Santa Clara County
(SM CMP) = CMP intersection in San Mateo County

* = Unsignalized intersection

SOURCE: Fehr & Peers, September 2018

Methodology for Identifying Freeway Segments and On-/Off-Ramps for Study

The freeway segments were selected in consultation with the County, and finalized based on VTA TIA Guidelines. Freeway segments were included for analysis if the proposed Project was expected to add traffic equal to or greater than one percent of the freeway segment's capacity.

Based on this criterion, the following freeway segments were analyzed for the weekday morning and evening peak hours:

- SR 85
  - Saratoga Avenue to South De Anza Boulevard
  - South De Anza Boulevard to Stevens Creek Boulevard
  - Stevens Creek Boulevard to I-280
- US 101 (Santa Clara County)
  - SR 37 to Moffett Boulevard
  - Moffett Boulevard to SR 85

  - SR 85 to North Shoreline Boulevard
  - North Shoreline Boulevard to Rengstorff Avenue
  - Rengstorff Avenue to San Antonio Road
  - San Antonio Road to Oregon Expressway
  - Oregon Expressway to Embarcadero Road
- US 101 (San Mateo County)
  - Embarcadero Road to University Avenue
  - University Avenue to Willow Road (SR 114)
  - Willow Road (SR 114) to Marsh Road
  - Marsh Road to Woodside Road (SR 84)
- I-280 (Santa Clara County)
  - Lawrence Expressway to Wolfe Road
  - Wolfe Road to De Anza Boulevard
  - De Anza Boulevard to SR85
  - SR 85 to Foothill Expressway
  - Foothill Expressway to Magdalena Avenue
  - Magdalena Avenue to El Monte Road
  - El Monte Road to La Barranca Road
  - La Barranca Road to Page Mill Road
  - Page Mill Road to Alpine Road
- I-280 (San Mateo County)
  - Alpine Road to Sand Hill Road
  - Sand Hill Road to Woodside Road (SR 84)
  - Woodside Road (SR 84) to Farm Hill Boulevard
  - Farm Hill Boulevard to Cañada Road
  - Cañada Road to Edgewood Road
  - Edgewood Road to SR 92

The following freeway ramps, which provide direct access to and from the Project site via US 101 and I-280, were also selected for analysis:

- US 101 Southbound
  - Willow Road Off-Ramp
  - University Avenue Off-Ramp
  - Embarcadero Road On-Ramp
  - Oregon Expressway On-Ramp
- US 101 Northbound
  - Willow Road On-Ramp
  - University Avenue On-Ramp
  - Embarcadero Road Off-Ramp
- Interstate 280 Southbound
  - Sand Hill Road On-Ramp
  - Sand Hill Road Off-Ramp
  - Alpine Road Off-Ramp
  - Alpine Road On-Ramp
  - Page Mill Road Off-Ramp
  - Page Mill Road On-Ramp

- Interstate 280 Northbound
  - Page Mill Road Off-Ramp
  - Page Mill Road Off-Ramp
  - Alpine Road Off-Ramp
  - Alpine Road On-Ramp
  - Sand Hill Road On-Ramp
  - Sand Hill Road Off-Ramp

Methodology for Identifying Residential Streets for Study

Multiple neighborhoods were considered for analysis, including five in the City of Palo Alto, three in the City of Menlo Park, and three in the City of East Palo Alto. Based on the effectiveness of existing traffic calming strategies in those neighborhoods (described in Section 8.3 of the TIA in Appendix TIA-REV), the current conditions within the neighborhoods, and the expected trip distribution and assignment of traffic from the proposed Project, two neighborhoods in Palo Alto (College Terrace and Crescent Park) were identified as locations where neighborhood traffic impacts might occur due to the Project. These locations were selected for the following reasons:

- ***College Terrace*** – The neighborhood lies along the southern boundary of the Project site and shares access with Stanford Avenue, which is a primary access route to the campus. Even though the traffic calming measures instituted in this neighborhood appear to have been effective, there remains a concern that there are routes through the neighborhood that drivers from Stanford can use to travel between Stanford Avenue and California Avenue to access Page Mill Road or El Camino Real.

- ***Crescent Park*** – The neighborhood lies along University Avenue, which is a major access route to regional roadways such as US 101 and SR 84 (Dumbarton Bridge). There is existing congestion on the corridor that includes spillover traffic to parallel roadways such as Hamilton Avenue. Because a sufficient number of the drivers accessing Stanford travel along University Avenue, this neighborhood was selected for further study.

Existing Level of Service Conditions – Intersections

Intersection turning movement counts were conducted primarily during October – November 2016. The counts were conducted during the weekday morning (7:00 to 10:00 AM) and afternoon/evening (4:00 to 7:00 PM) peak periods on clear days with area schools in session. The single hour during each count period with the highest traffic volumes at each intersection was identified as its peak hour. Existing intersection lane configurations, signal timings, and peak-hour turning movement volumes were used to calculate existing peak-hour levels of service (LOS) for the study intersections.[3] As shown in **Table 5.15-2**, all except the following six intersections (delay/LOS shown in bold in the table) currently operate at acceptable service levels:

13. I-280 Southbound Ramps / Page Mill Road – LOS F, AM and PM peak hours (signal warrant met)
17. Junipero Serra Boulevard-Foothill Expressway / Page Mill Road – LOS F, AM and PM peak hours

[3] The LOS analysis was performed using the TRAFFIX 8.0 software with the VTA-required analysis settings.

30. Foothill Expressway / Arastradero Road – LOS F, PM peak hour
32. Foothill Expressway / El Monte Avenue – LOS F, PM peak hour
77. Woodland Avenue / University Avenue – LOS E+, PM peak hour
79. Donohoe Street / University Avenue – LOS E, AM peak hour

TABLE 5.15-2
EXISTING INTERSECTION LEVEL OF SERVICE (LOS) AND DELAY (SECOND PER VEHICLE)

ID No.	Intersection	Jurisdiction (CMP Network)[a]	Peak Hour	Delay (sec/veh.)[b]	LOS
1	I-280 Northbound On-Ramp / Sand Hill Road	Menlo Park	AM PM	10.6 10.2	B+ B+
2	I-280 Northbound Off-Ramp / Sand Hill Road	Menlo Park	AM PM	39.1 17.2	D B
3	Addison Wesley / Sand Hill Road	Menlo Park	AM PM	18.8 19.4	B- B-
4	Saga Lane / Sand Hill Road	Menlo Park	AM PM	13.6 19.0	B B-
5	Sharon Park Drive / Sand Hill Road	Menlo Park	AM PM	16.5 15.8	B B
6	Alameda de las Pulgas / Santa Cruz Avenue	San Mateo County	AM PM	13.9 13.8	B B
7	Santa Cruz Avenue / Sand Hill Road	Menlo Park	AM PM	47.2 46.7	D D
8	Oak Avenue / Sand Hill Road	Menlo Park	AM PM	10.5 3.8	B+ A
9	Stock Farm Road / Sand Hill Road	Palo Alto	AM PM	20.0 25.9	C+ C
10	Pasteur Drive / Sand Hill Road	Palo Alto	AM PM	19.9 23.9	B- C
11	Arboretum Road / Sand Hill Road	Palo Alto	AM PM	21.5 27.8	C+ C
12	El Camino Real / Sand Hill Road	Palo Alto (SC CMP)	AM PM	32.8 32.1	C- C-
13	I-280 Southbound Ramps / Page Mill Road[c]	Santa Clara County	AM PM	**93.4** **72.0**	**F** **F**
14	I-280 Northbound Ramps / Page Mill Road[c]	Santa Clara County	AM PM	14.2 13.4	D B
15	Deer Creek Road / Page Mill Road	Santa Clara County	AM PM	14.2 13.4	B B
16	Coyote Hill Road / Page Mill Road	Santa Clara County	AM PM	7.5 8.6	A A
17	Junipero Serra Blvd - Foothill Expressway / Page Mill Road	Santa Clara County (SC CMP)	AM PM	**93.6** **93.0**	**F** **F**
18	Peter Coutts / Page Mill Road	Santa Clara County	AM PM	20.0 28.4	C+ C
19	Hanover Street / Page Mill Road	Santa Clara County (SC CMP)	AM PM	60.1 48.6	E D
20	El Camino Real / Page Mill Road - Oregon Expressway	Santa Clara County (SC CMP)	AM PM	57.9 62.2	E+ E

TABLE 5.15-2 (CONTINUED)
EXISTING INTERSECTION LEVEL OF SERVICE (LOS) AND DELAY (SECOND PER VEHICLE)

ID No.	Intersection	Jurisdiction (CMP Network)[a]	Peak Hour	Delay (sec/veh.)[b]	LOS
21	Middlefield Road / Oregon Expressway	Santa Clara County (SC CMP)	AM PM	62.3 57.5	E E+
22	Oregon Expressway / West Bayshore Road	Santa Clara County	AM PM	17.3 18.7	B B-
23	I-280 Southbound Ramps / Alpine Road[c]	San Mateo County	AM PM	36.6 15.7	E C
24	I-280 Northbound Ramps / Alpine Road[c]	San Mateo County	AM PM	25.1 24.2	D C
25	Junipero Serra Blvd / Alpine Road	Menlo Park	AM PM	41.9 47.4	D D
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	AM PM	26.9 37.8	C D+
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	AM PM	13.2 15.2	B B
28	Junipero Serra Blvd / Stanford Avenue	Santa Clara County	AM PM	18.8 19.9	B- B-
29	Foothill Expressway / Hillview Avenue	Santa Clara County	AM PM	33.5 34.2	C- C-
30	Foothill Expressway / Arastradero Road	Santa Clara County (SC CMP)	AM PM	66.9 **83.6**	E **F**
31	Foothill Expressway / San Antonio Road	Santa Clara County (SC CMP)	AM PM	17.9 67.2	B E
32	Foothill Expressway / El Monte Avenue	Santa Clara County (SC CMP)	AM PM	63.3 **84.4**	E **F**
33	Foothill Expressway / Springer Road-Magdalena Avenue	Santa Clara County (SC CMP)	AM PM	58.8 70.2	E+ E
34	Bowdoin Street / Stanford Avenue[c]	Palo Alto	AM PM	13.1 16.8	B C
35	Arboretum Road / Quarry Road	Palo Alto	AM PM	44.9 42.2	D D
36	Arboretum Road / Palm Drive	Palo Alto	AM PM	30.0 29.7	C C
37	El Camino Real / Encinal Avenue	Menlo Park	AM PM	16.8 29.5	B C
38	El Camino Real / Valparaiso Avenue	Menlo Park	AM PM	40.2 37.5	D D+
39	El Camino Real / Oak Grove Avenue	Menlo Park	AM PM	30.7 35.0	C D+
40	El Camino Real / Santa Cruz Avenue	Menlo Park	AM PM	13.6 19.7	B B-
41	El Camino Real / Ravenswood Road	Menlo Park	AM PM	41.2 44.6	D D
42	El Camino Real / Roble Avenue	Menlo Park	AM PM	12.9 13.4	B B
43	El Camino Real / Middle Avenue	Menlo Park	AM PM	27.1 27.1	C C

TABLE 5.15-2 (CONTINUED)
EXISTING INTERSECTION LEVEL OF SERVICE (LOS) AND DELAY (SECOND PER VEHICLE)

ID No.	Intersection	Jurisdiction (CMP Network)[a]	Peak Hour	Delay (sec/veh.)[b]	LOS
44	El Camino Real / Cambridge Avenue	Menlo Park	AM PM	13.2 19.1	B B-
45	El Camino Real / Quarry Road	Palo Alto	AM PM	15.2 33.1	B C-
46	El Camino Real (Southbound) / University Avenue	Palo Alto (SC CMP)	AM PM	21.0 20.0	C+ C+
47	El Camino Real (Northbound) / University Avenue	Palo Alto (SC CMP)	AM PM	18.7 26.3	B- C
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)	AM PM	44.9 49.1	D D
49	El Camino Real / Churchill Avenue	Palo Alto	AM PM	23.1 25.9	C C
50	El Camino Real / Serra Street	Palo Alto	AM PM	22.3 25.8	C+ C
51	El Camino Real / Stanford Avenue	Palo Alto	AM PM	33.0 31.0	C- C
52	El Camino Real / California Avenue	Palo Alto	AM PM	23.6 28.5	C C
53	El Camino Real / Arastradero Road - Charleston Road	Palo Alto (SC CMP)	AM PM	47.2 53.0	D D-
54	El Camino Real / San Antonio Road	Mountain View (SC CMP)	AM PM	52.7 53.0	D- D-
55	Alma Street / Lytton Avenue	Palo Alto	AM PM	18.3 18.3	B- B-
56	Alma Street / Hamilton Avenue	Palo Alto	AM PM	6.7 13.3	A B
57	Alma Street / Churchill Avenue	Palo Alto	AM PM	26.9 46.5	C D
58	Alma Street / Charleston Road	Palo Alto	AM PM	53.5 50.9	D- D
59	Middlefield Road / Marsh Road	Atherton	AM PM	24.0 40.2	C D
60	Middlefield Road / Ravenswood Avenue	Menlo Park	AM PM	31.3 36.1	C D+
61	Middlefield Road / Ringwood Avenue	Menlo Park	AM PM	37.1 50.0	D+ D
62	Middlefield Road / Willow Road	Menlo Park	AM PM	47.3 46.6	D D
63	Middlefield Road / Lytton Avenue	Palo Alto	AM PM	36.3 43.7	D+ D
64	Middlefield Road / University Avenue	Palo Alto	AM PM	29.0 33.7	C C-
65	Middlefield Road / Hamilton Avenue	Palo Alto	AM PM	11.4 11.6	B+ B+
66	Middlefield Road / Embarcadero Road	Palo Alto	AM PM	33.2 36.6	C- D+

TABLE 5.15-2 (CONTINUED)
EXISTING INTERSECTION LEVEL OF SERVICE (LOS) AND DELAY (SECOND PER VEHICLE)

ID No.	Intersection	Jurisdiction (CMP Network)[a]	Peak Hour	Delay (sec/veh.)[b]	LOS
67	Saint Francis Drive / Embarcadero Road	Palo Alto	AM PM	23.6 17.5	C B
68	E. Bayshore Road / Embarcadero Road	Palo Alto	AM PM	44.1 53.6	D D-
69	Middlefield Road / Charleston Road	Palo Alto	AM PM	49.8 52.4	D D-
70	US 101 Southbound Ramps / Marsh Road	Menlo Park	AM PM	21.0 24.7	C+ C
71	US 101 Northbound Ramps / Marsh Road	Menlo Park	AM PM	16.3 14.9	B B
72	Bay Road / Willow Road	Menlo Park	AM PM	16.8 10.7	B B+
73	Newbridge Street / Willow Road	Menlo Park	AM PM	42.7 40.6	D D
74	O'Brien Drive / Willow Road	Menlo Park	AM PM	11.0 11.8	B+ B+
75	Hamilton Avenue / Willow Road	Menlo Park	AM PM	14.5 18.8	B B-
76	Bayfront Expressway / Willow Road	Menlo Park (SM CMP)	AM PM	39.0 56.8	D+ E+
77	Woodland Avenue / University Avenue	East Palo Alto	AM PM	48.1 **58.9**	D **E+**
78	US 101 Southbound Ramps / University Avenue	East Palo Alto	AM PM	26.7 25.0	C C
79	Donohoe Street / University Avenue	East Palo Alto	AM PM	**65.3** 42.5	**E** D
80	University Avenue / Bay Road	East Palo Alto	AM PM	38.0 47.1	D+ D
81	University Avenue / Bayfront Expressway	Menlo Park (SM CMP)	AM PM	21.7 85.0	C+ F
82	Town & Country Driveway / Embarcadero Road	Palo Alto	AM PM	29.2 27.9	C C
83	Charleston Road / San Antonio Road	Palo Alto (SC CMP)	AM PM	54.5 51.6	D- D-
84	US 101 Southbound Ramps / Willow Road [d]	Menlo Park	AM PM	N/A [d]	N/A [d]
85	US 101 Northbound Ramps / Willow Road [d]	Menlo Park	AM PM	N/A [d]	N/A [d]
86	Central Expressway / Rengstorff Avenue	Santa Clara County (SC CMP)	AM PM	76.7 62.1	E- E
87	Central Expressway / Shoreline Boulevard (N)	Santa Clara County (SC CMP)	AM PM	3.2 5.4	A A
88	Central Expressway / Shoreline Boulevard (S)	Santa Clara County (SC CMP)	AM PM	8.1 7.4	A A
89	Central Expressway / Moffett Boulevard	Santa Clara County (SC CMP)	AM PM	62.6 63.4	E E

TABLE 5.15-2 (CONTINUED)
EXISTING INTERSECTION LEVEL OF SERVICE (LOS) AND DELAY (SECOND PER VEHICLE)

ID No.	Intersection	Jurisdiction (CMP Network)[a]	Peak Hour	Delay (sec/veh.)[b]	LOS
90	Foothill Expressway / Edith Avenue	Santa Clara County	AM PM	28.8 27.6	C C
91	Foothill Expressway / Main Street	Santa Clara County (SC CMP)	AM PM	22.3 22.5	C+ C+
92	University Avenue / O'Brien Drive	Menlo Park	AM PM	7.8 12.5	A B
93	University Avenue / Adams Drive [c]	Menlo Park	AM PM	62.4 21.4	F [e] C
94	University Avenue / Runnymede Street	East Palo Alto	AM PM	14.9 19.8	B B-
95	University Avenue / Bell Street	East Palo Alto	AM PM	14.5 17.7	B B

Bold text indicates intersection operates at unacceptable level of service.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections.
(SC CMP) = CMP intersection in Santa Clara County
(SM CMP) = CMP intersection in San Mateo County
[b] Weighted average control delay expressed in seconds per vehicle for the overall intersection for signalized intersections and all-way stop-controlled intersections. For side-street stop-controlled intersections, total delay for the worst movement is reported.
[c] Unsignalized Intersection
[d] The US 101 / Willow Road interchange reconfiguration is estimated to be constructed by 2020; hence does not exist now.
[e] The signal warrant is not met at this intersection.

SOURCE: Fehr & Peers, September 2018

Existing Level of Service Conditions – Freeway Segments

San Mateo County

The San Mateo County City/County Association of Governments (C/CAG) is the congestion management agency of San Mateo County. The *San Mateo County Congestion Management Program 2015* report provides information on the worst-performing segments on each route. The LOS method used within the CMP report is based on calculated volume-to-capacity (V/C) ratios and LOS criteria described in the *1994 Highway Capacity Manual*. As shown in **Table 5.15-3**, within San Mateo County, I-280 between SR 92 and SR 84 currently exceeds C/CAG's LOS standard during the AM and PM peak hours.

TABLE 5.15-3
EXISTING FREEWAY SEGMENT LEVEL OF SERVICE IN SAN MATEO COUNTY

Freeway	Roadway Segment	LOS Standard	AM LOS	PM LOS
I-280	SR 92 to SR 84	D	**E**	**E**
	SR 84 to Santa Clara County Line	F	A	F
US 101	Whipple Avenue to Santa Clara County Line	F	F	F

SOURCE: Jacobs, *Level of Service and Performance Measure Monitoring Report – 2015*, September 2015.

Santa Clara County

Table 5.15-4 contains the existing freeway segments level of service for the mixed-flow and HOV lanes based on the segment densities (expressed in terms of passenger cars per mile per lane). The following freeway segments within Santa Clara County exceed VTA's LOS E standard during the specified peak hour:

SR 85 Northbound (AM Peak Hour)

- South De Anza Boulevard to I-280 US 101 Northbound (HOV lane, too)
- Moffett Boulevard to Rengstorff Avenue

SR 85 Southbound (PM Peak Hour)

- Stevens Creek Boulevard to Saratoga Avenue
- I-280 to Stevens Creek Boulevard (HOV lane only)

I-280 Northbound (AM Peak Hour)

- Lawrence Expressway to Foothill Expressway

I-280 Southbound (PM Peak Hour)

- Page Mill Road to Magdalena Avenue
- SR 85 to Lawrence Expressway

US 101 Northbound (PM Peak Hour)

- North Shoreline Boulevard to Embarcadero Road

US 101 Southbound (PM Peak Hour)

- Embarcadero Road to Rengstorff Avenue
- SR 85 to SR 237

Existing Level of Service Conditions – Freeway Ramps

Analysis of freeway ramp vehicle queuing was conducted for the proposed Project to evaluate any potential queues spillback onto the freeway (from off-ramps) or local streets (from on-ramps).

Freeway On-Ramp Operations

Within the study area, there are freeway on-ramps equipped with ramp meters. Ramp metering rates (vehicles per hour per lane [vphpl]) change based on queuing on the freeway and on the on-ramps. The evaluation of study area on-ramps used a Caltrans-provided range of metering rates of 250 to 900 vphpl for the US 101 Southbound On-Ramp from Oregon Expressway, and 420 to 900 vphpl for the US 101 Southbound On-Ramp from Embarcadero Road.

As shown in **Table 5.15-5**, queues remain within the storage length when the ramp metering rate operates at the maximum (900 vphpl). All queues exceed the available storage length when using the minimum ramp metering rate, although it is unlikely that the metering rate remains at the minimum rate, given the above-stated ability for the rate to change. **Table 5.15-6** shows the other (non-metered) on-ramps that provide access to Stanford.

TABLE 5.15-4
EXISTING FREEWAY SEGMENT LEVEL OF SERVICE (LOS) AND DENSITY (IN SANTA CLARA COUNTY)

Freeway	Direction	Segment	Peak Hour	Number of Lanes		Density		LOS	
				Mixed	HOV	Mixed	HOV	Mixed	HOV
SR 85	NB	Saratoga Avenue to South De Anza Boulevard	AM PM	2	1	52 21	36 8	E C	D A
	NB	South De Anza Boulevard to Stevens Creek Boulevard	AM PM	2	1	65 22	64 9	F C	F A
	NB	Stevens Creek Boulevard to I-280	AM PM	2	1	124 13	108 6	F B	F A
	SB	I-280 to Stevens Creek Boulevard	AM PM	2	1	21 52	5 66	C E	A F
	SB	Stevens Creek Boulevard to South De Anza Boulevard	AM PM	2	1	18 90	5 47	B F	A E
	SB	South De Anza Boulevard to Saratoga Avenue	AM PM	2	1	21 62	8 52	C F	A E
US 101	NB	SR 237 to Moffett Boulevard	AM PM	3	1	49 36	35 22	E D	D C
	NB	Moffett Boulevard to SR 85	AM PM	3	1	66 52	33 16	F E	D B
	NB	SR 85 to N. Shoreline Boulevard	AM PM	4	1[a]	79 47	34 15	F E	D B
	NB	N. Shoreline Boulevard to Rengstorff Avenue	AM PM	3	1[a]	76 74	25 13	F F	C B
	NB	Rengstorff Avenue to San Antonio Road	AM PM	3	1[a]	42 62	20 11	D F	C A
	NB	San Antonio Road to Oregon Expressway	AM PM	3	1[a]	42 62	29 22	D F	D C
	NB	Oregon Expressway to Embarcadero Road	AM PM	3	1	46 62	38 36	D F	D D
	SB	Embarcadero Road to Oregon Expressway	AM PM	3	1	35 104	33 83	D F	D F
	SB	Oregon Expressway to San Antonio Road	AM PM	3	1[a]	34 89	19 26	D F	C C
	SB	San Antonio Road to Rengstorff Avenue	AM PM	3	1[a]	48 85	18 19	E F	B C
	SB	Rengstorff Avenue or N. Shoreline Boulevard	AM PM	3	1[a]	40 49	21 20	D E	C C
	SB	N. Shoreline Boulevard to SR 85	AM PM	3	1[a]	36 47	27 32	D E	D D
	SB	SR 85 to Moffett Boulevard	AM PM	3	1	31 103	28 35	D F	D D
	SB	Moffett Boulevard to SR 237	AM PM	3	1	33 70	22 36	D F	C D

TABLE 5.15-4 (CONTINUED)
EXISTING FREEWAY SEGMENT LEVEL OF SERVICE (LOS) AND DENSITY (IN SANTA CLARA COUNTY)

Freeway	Direction	Segment	Peak Hour	Number of Lanes		Density		LOS	
				Mixed	HOV	Mixed	HOV	Mixed	HOV
I-280	NB	Lawrence Expressway to Wolfe Road	AM PM	3	1	81 23	46 10	F C	D A
	NB	Wolfe Road to De Anza Boulevard	AM PM	3	1	62 25	57 7	F C	E A
	NB	De Anza Boulevard to SR 85	AM PM	3	1	73 23	45 7	F C	D A
	NB	SR 85 to Foothill Expressway	AM PM	3	1	70 22	58 8	F C	E A
	NB	Foothill Expressway to Magdalena Avenue	AM PM	3	1	37 22	53 13	D C	E B
	NB	Magdalena Avenue to El Monte Road	AM PM	4	0	48 25	n/a n/a	E C	n/a n/a
	NB	El Monte Road to La Barranca Road	AM PM	4	0	39 21	n/a n/a	D C	n/a n/a
	NB	La Barranca Road to Page Mill Road	AM PM	4	0	32 25	n/a n/a	D C	n/a n/a
	NB	Page Mill Road to Alpine Road	AM PM	4	0	32 36	n/a n/a	C D	n/a n/a
	SB	Alpine Road to Page Mill Road	AM PM	4	0	25 32	n/a n/a	C D	n/a n/a
	SB	Page Mill Road to La Barranca Road	AM PM	4	0	21 68	n/a n/a	C F	n/a n/a
	SB	La Barranca Road to El Monte Road	AM PM	4	0	20 67	n/a n/a	C F	n/a n/a
	SB	El Monte Road to Magdalena Avenue	AM PM	4	0	20 81	n/a n/a	C F	n/a n/a
	SB	Magdalena Avenue to Foothill Expressway	AM PM	3	1	23 37	12 18	C D	B C
	SB	Foothill Expressway to SR 85	AM PM	3	1	33 40	14 14	D D	B B
	SB	SR 85 to De Anza Boulevard	AM PM	3	1	24 103	9 19	C F	A E
	SB	De Anza Boulevard to Wolfe Road	AM PM	3	1	36 77	10 30	D F	A E
	SB	Wolfe Road to Lawrence Expressway	AM PM	3	1	35 81	16 19	D F	B E

[a] Data is provided from the 2014 Conformance and Monitoring Report, which specifies one HOV lane on the identified segments in the year 2014.

SOURCE: VTA Monitoring and Conformance Report, 2014

TABLE 5.15-5
EXISTING FREEWAY METERED ON-RAMP QUEUING EVALUATION

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	Ramp Volume	Min. / Max. Queue (feet)[c]
Oregon Expressway (US 101 Southbound)	1,400	AM PM	1,297 1,275	30 / 18,090 30 / 64,260
Embarcadero Road (US 101 Southbound)	1,150	AM PM	803 720	30 / 17,940 690 / 23,490

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] Minimum queues estimated using the maximum metering rates provided by Caltrans (see text above). Maximum queues estimated using the minimum metering rates provided by Caltrans (see text above). The minimum queue is one vehicle, which is equal to 30 feet.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

TABLE 5.15-6
EXISTING FREEWAY NON-METERED ON-RAMP VOLUMES AND STORAGE CAPACITY

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	Existing Ramp Volume
US 101 Northbound On-Ramps			
Willow Road	650	AM PM	361 232
University Avenue	880	AM PM	357 119
I-280 Northbound On-Ramps			
Sand Hill Road	1,460	AM PM	509 974
Alpine Road	1,000	AM PM	350 691
Page Mill Road	700	AM PM	666 1,374
I-280 Southbound On-Ramps			
Page Mill Road	1,500	AM PM	585 902
Alpine Road	650	AM PM	364 546
Sand Hill Road	800	AM PM	325 954

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

Freeway Off-Ramp Operations

Off-ramp queues that terminate at an intersection were evaluated using ramp-terminal intersection queue estimates from the intersection LOS calculations. Slip ramps where there is no control device (e.g., no signal or stop sign) and the ramp merges with the local street were evaluated using V/C ratios.

Table 5.15-7 presents the available storage and calculated queue lengths for the signalized turning movements that provide access to the Project site. Data for left-turning (and/or through) and right-turning vehicles are presented separately based on which turning movement serves the Project site. As shown in the table, all off-ramps serve vehicle queues within the available ramp storage. However, the following turn queues exceed the available turn-pocket storage queue:

- US 101 / University Avenue southbound loop off-ramp – right-turn queue exceeds pocket storage length during the AM and PM peak periods
- I-280 / Sand Hill Road northbound diagonal off-ramp – right-turn queue exceeds pocket storage length during the AM and PM peak periods
- I-280 / Page Mill Road southbound diagonal off-ramp – left-turn queue exceeds pocket storage length during the AM and PM peak periods

TABLE 5.15-7
EXISTING FREEWAY OFF-RAMP QUEUING EVALUATION
(SIGNALIZED AND STOP-CONTROLLED TERMINAL INTERSECTIONS)

Off-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	Ramp Volume[c]	Queue (feet)[d]
US 101 Southbound Off-Ramps				
University Avenue	1,870 / 190	AM PM	260 / 249 184 / 529	480 / 480 270 / 630
I-280 Northbound Off-Ramps				
Sand Hill Road	740 / 300	AM PM	93 / 494 49 / 182	90 / 930 90 / 330
Alpine Road [f]	1,360 / 280	AM PM	248 / 808 129 / 259	30 / [e] 30 / [e]
Page Mill Road	60 / 1,830	AM PM	131 / 1,810 50 / 288	60 / [e] 30 / [e]
I-280 Southbound Off-Ramps				
Alpine Road	1,370 / 450	AM PM	381 / 453 154 / 243	210 / [e] 30 / [e]
Page Mill Road [f]	150 / 1,940	AM PM	1,025 / 453 791 / 44	330 / [e] 270 / [e]

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements. Storage Capacity for a Controlled Ramp - ##/## = left-turn and (or) through pocket / right-turn pocket
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] Ramp volume by turning movement - ##/## = left-turn and (or) through movement / right-turn movement
[d] The queue indicated represents the 95th Percentile Queue for signalized movements and the Average Queue for stop- controlled movements - ##/## = left-turn and (or) through queue / right-turn queue
[e] Only left-turn movement is stop-controlled. Free right-turn queues are not provided.
[f] For all-way stop-controlled ramp intersections, the average queue is reported due to the limitations of the *2000 HCM*.

SOURCE: Fehr & Peers, September 2018.

While these turn queues exceed the available turn pocket storage, the queue is served within the total ramp storage, and does not spillback into the freeway mainline.

As shown in **Table 5.15-8**, the V/C ratios for the off-ramps with uncontrolled terminal intersections are less than 1.00, indicating that the off-ramps have sufficient capacity to accommodate the exiting volumes at these locations.

TABLE 5.15-8
EXISTING FREEWAY OFF-RAMP QUEUING EVALUATION
(UNCONTROLLED TERMINAL INTERSECTIONS)

Off-Ramp	Maximum Vehicle Flow Rate (Capacity, vphpl)[a]	Peak Period [b]	Ramp Volume	Volume-to-Capacity Ratio
US 101 Northbound Off-Ramps				
Embarcadero Road (diagonal)	1,800	AM PM	727 409	0.40 0.23
US 101 Southbound Off-Ramps				
Willow Road (loop)	1,900	AM PM	423 394	0.22 0.21
I-280 Northbound Off-Ramps				
Alpine Road (loop) [c]	1,900	AM PM	808 259	0.43 0.14
Page Mill Road (loop) [c]	1,900	AM PM	1,810 288	0.95 0.15
I-280 Southbound Off-Ramps				
Sand Hill Road (diagonal)	1,800	AM PM	1,361 523	0.76 0.29
Alpine Road (loop) [c]	1,900	AM PM	453 243	0.24 0.13
Page Mill Road (loop) [c]	1,900	AM PM	41 44	0.02 0.02

[a] Diagonal ramps were assumed to have a capacity of 1,900 vehicles per hour per lane (vphpl). Loop ramps were assumed to have a capacity of 1,800 vphpl.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] The right-turn movement is uncontrolled. Therefore, the right-turn volume and V/C is the only ramp movement reported in the table.

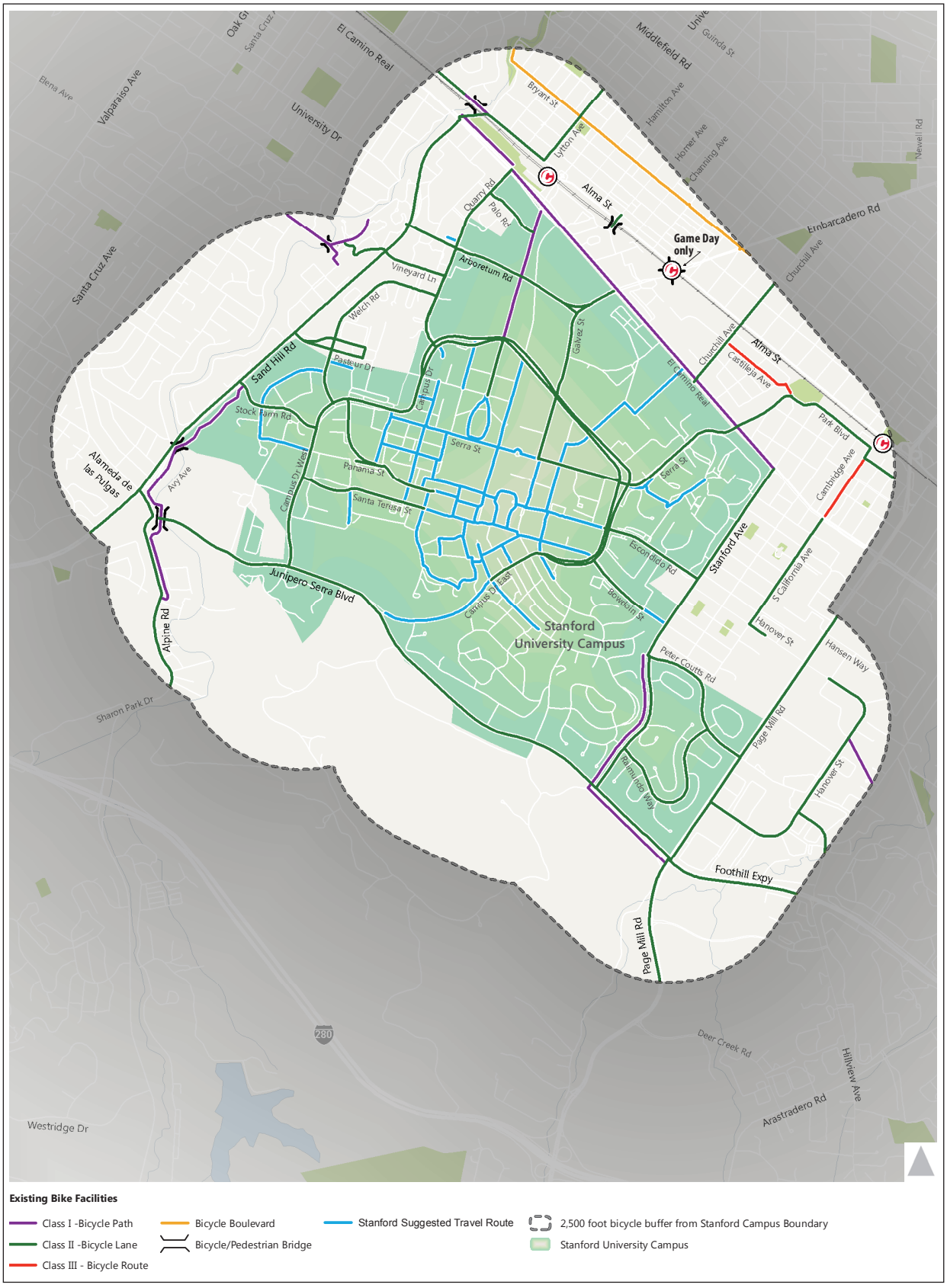
SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

Bicycle Facilities

Bicycle facilities on- and off-campus include a combination of Class I, II, and III bikeways (see **Figure 5.15-3**).

On-Campus Bicycle Facilities

A bicycle path (Class I) is present along Palm Drive between the El Camino Real southbound ramps intersection and Campus Drive. The Stanford Perimeter Trail is a shared-use recreational path that runs along Junipero Serra Boulevard, Stanford Avenue, and El Camino Real, providing connections to trails in adjacent jurisdictions, parks, schools, and other destinations commuting from off-campus residences or traveling to off-campus amenities.



SOURCE: Fehr & Peers

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Figure 5.15-3
Existing Bicycle Facilities

Bicycle lanes (Class II) are present along the following roads:

- Sand Hill Road
- Quarry Road
- Welch Road
- Galvez Street
- Serra Street
- Stanford Avenue
- Raimundo Way
- Palo Road
- Arboretum Road
- Vineyard Lane
- Pasteur Drive
- Stock Farm Road
- Panama Street
- Santa Teresa Street
- Escondido Road
- Bowdoin Street
- Peter Coutts Road

On Campus Drive, which forms a near-complete loop around the campus, bicycle lanes are provided everywhere except on Campus Drive East between Mayfield Avenue and Junipero Serra Boulevard. Escondido Road and Escondido Mall is a bicycle priority street connecting the East Campus residential areas to the campus core. Santa Teresa Street performs a similar function for the West Campus and Lagunita District residential areas. Bicycle roundabouts are present at the intersections of Escondido Mall/Lasuen Mall and Serra Mall/Lasuen Mall to accommodate these high bicycle volumes.

Several key roadways that provide vehicle access to parking lots and structures near Campus Drive convert to non-auto streets on-campus. These facilities include Escondido Mall, Serra Mall, Panama Mall, Lasuen Mall, Lomita Mall, and the pathway network through White Plaza and Meyer Green. In addition, there are several bicycle/pedestrian/transit only routes, such as Serra Mall, which runs in a north/south direction. The other key bicycle routes used to access the campus core include Mayfield Avenue, Via Ortega, and Panama Street.

Off-Campus Bicycle Facilities

The cities of Palo Alto and Menlo Park maintain a system of on- and off-road bicycle paths, lanes, and routes, which include underpasses or bridges. Bicycles are legal on all streets in Palo Alto and Menlo Park, except freeways, though there are some major streets with narrow lanes that are not easily shared by bicyclists and motor vehicles.

Among the gateways to the Stanford campus, bicycle lanes along Serra Street and Escondido Road, and the bike path on Palm Drive, provide connections to key off-campus bicycle and transit facilities, including Park Avenue, Hanover Street and the Palo Alto Transit Center. Other notable bicycle gateways include Welch Road, Stock Farm Road, Bowdoin Street and Quarry Road.

The City of Palo Alto has several bicycle paths within the study area, notably along portions of Sand Hill Road, Alpine Road, and along the Bol Park Bike Path, which provides connection to Stanford's Research Park and Arastradero Road. In addition, the Embarcadero Bike Path provides an east- west connection parallel to the Caltrain Corridor between facilities along Sand Hill Road, Palm Avenue, Embarcadero Road and Churchill Avenue.

Within the study area and the City of Palo Alto, bicycle lanes are present along the following corridors:

- Sand Hill Road
- Lytton Avenue
- Churchill Avenue
- California Avenue
- Page Mill Road
- Alpine Road
- Junipero Serra Boulevard/Foothill Expressway
- Alma Street
- Park Boulevard
- Hanover Street

Stanford Avenue is an important facility for commuters and local residents alike, and features bicycle lanes on both sides of the roadway with green bicycle lanes where potential conflict zones emerge.

The City of Palo Alto has designated certain streets as bicycle boulevards. Bike boulevards are bicycle routes with high bicycle usage and relatively low vehicle traffic, and often include special signs, traffic calming devices that slow vehicles, and partial roadway closures that permit only bicycles to travel through. Bryant Street is a bicycle boulevard that provides north/south connectivity through the City of Palo Alto. Several additional bicycle routes (Class IIII) exist within the study area, notably along Clark Way, and portions of California Avenue and Hanover Street.

The City of Menlo Park has several bike lanes within the study area, notably along Alma Street, Alpine Road, Santa Cruz Avenue, and Sand Hill Road. There are three bicycle and pedestrian overcrossings along San Francisquito Creek that connect Menlo Park and Palo Alto: on San Mateo Drive, Alma Street and Willow Place. These facilities provide important off-street connections for cyclists and pedestrians, allowing them to avoid the busy roadway crossings at Middlefield Road and El Camino Real. In addition, two undercrossings provide important connections for bicyclists in the study area. One undercrossing is located beneath Junipero Serra Boulevard just east of Alpine Road and adjacent to the Stanford Golf Course, providing a connection to Sand Hill Road. The Palo Alto Transit Center features another undercrossing to provide users of the system with a connection across the Caltrain Corridor.

Pedestrian Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and shared use paths. Pedestrian connectivity immediately surrounding the Stanford campus is provided by a mostly-complete network of sidewalks and crosswalks. Sidewalks are present on both sides of University Avenue, Embarcadero Road, Churchill Avenue, Park Boulevard, Yale Street, Wellesley Street, Oberlin Street, Bowdoin Street, Peter Coutts Road, Stanford Avenue, Welch Road, Vineyard Lane, and Arboretum Road. Signalized crossings on El Camino Real, which have pedestrian signals to provide safe crossings, are provided at numerous locations in the study area, including Sand Hill Road, Quarry Road, University Avenue/Palm Drive, and Embarcadero Road.

Most of the pedestrian network surrounding the campus is mostly built-out, and there are only minor sidewalk gaps. Sidewalks are present in most parts of Palo Alto and Menlo Park. On the unincorporated Santa Clara County lands, Stanford recently constructed a new pedestrian

pathway along Junipero Serra Boulevard between Page Mill Road and Stanford Avenue. There is no sidewalk along Junipero Serra Boulevard between Stanford Avenue and Sand Hill Road due to right-of-way constraints. Palo Road provides a shared-use path on the east side of the road and directs foot traffic away from Stanford toward El Camino Real. Crosswalks are also present in many locations of the study area. High vehicle volumes and speeds, coupled with long distances between protected pedestrian crossings, create barriers for pedestrian connectivity to Stanford along portions of El Camino Real, Page Mill Road, and Sand Hill Road. Other major barriers for pedestrians in the study area include the Caltrain tracks that parallel Alma Street.

Existing Transit Services

An extensive public transit network of rail, buses, and ferries serves the greater San Francisco Bay Area; many of these transit providers offer service near Stanford. The Palo Alto Transit Center is a point of convergence for Caltrain and several bus lines operated by VTA, San Mateo County Transit (SamTrans), Alameda-Contra Costa Transit District (AC Transit), and Stanford Marguerite Shuttle. There are free shuttles operated by Stanford (the Marguerite), the City of Palo Alto, and the City of Menlo Park that offer service to Stanford and neighboring cities. **Figure 5.15-4** shows the existing transit facilities and routes in the study area, except the Marguerite Shuttle, which is shown in **Figure 5.15-5**. Details of bus routes are presented in Table 4-10 of the TIA in Appendix TIA-REV, which summarizes the weekday destinations, hours of operation, and service frequencies for transit services within a 2,000-foot walking distance of the Stanford campus.

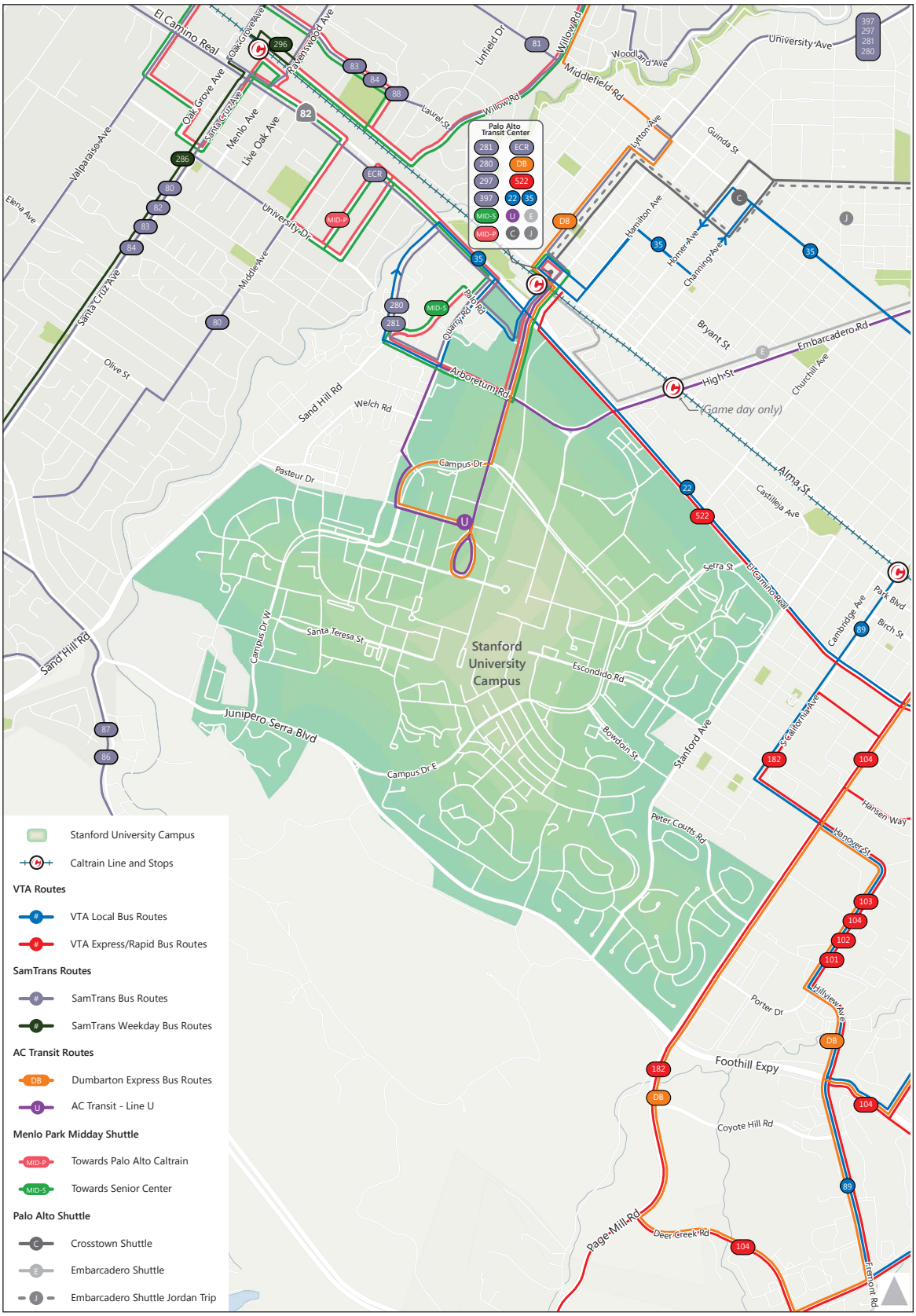
Caltrain

The Peninsula Corridor Joint Powers Board (JPB) rail service (aka Caltrain) runs north-south along the Peninsula from San Francisco to San Jose, with some service extending to Gilroy. Stanford is primarily served by stations at the Palo Alto Transit Center (east of El Camino Real at University Avenue) and at the California Avenue Station. There is an additional Caltrain station near Embarcadero Road that is only in service during days there is a Stanford football game and is not operational during typical peak periods.

The current weekday schedule consists of frequent train intervals (5 to 30 minutes) during commute hours, with hourly service provided during non-commute times. Northbound trains depart Palo Alto during the period from 5:02 AM to 11:04 PM. Southbound trains depart Palo Alto during the period from 5:51 AM to 12:59 AM. Caltrain provides Baby Bullet Express Service that allows under one-hour travel between San Jose and San Francisco. This service runs during both the AM and PM peak periods in both directions, a total of 22 trips each day. Six baby bullet trains stop at the Palo Alto Transit Center station in each of the northbound AM and PM, and southbound PM peak periods; five baby bullet trains stop at the Palo Alto Transit center in the southbound AM peak period. Baby bullet trains do not stop at the California Avenue Station.

Santa Clara Valley Transportation Authority (VTA)

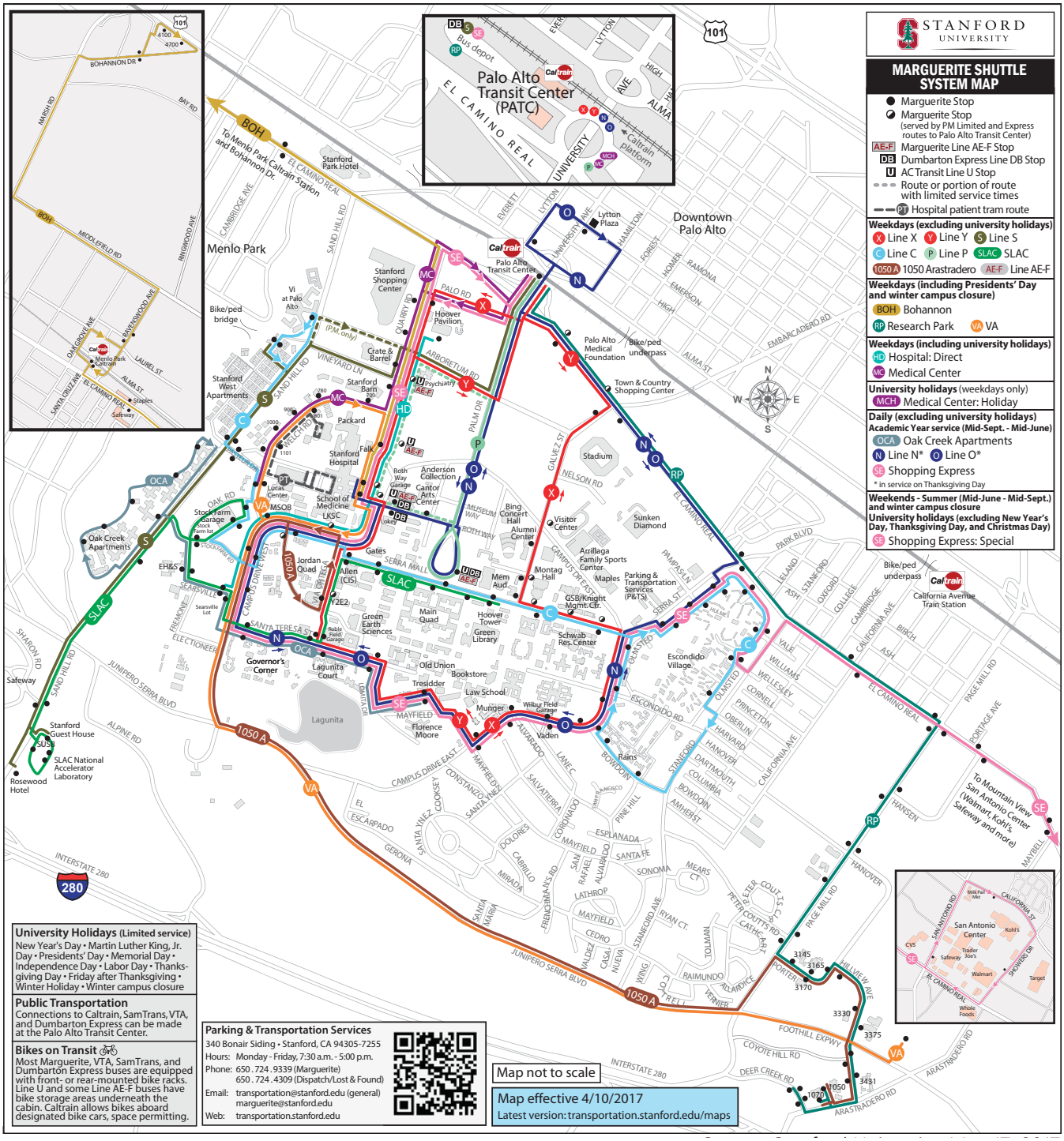
VTA operates fixed route, commuter, and paratransit bus service and light-rail service in Santa Clara County. VTA serves the Palo Alto Transit Center with local routes 22, 35 and the limited-stop Bus Rapid Transit route 522; route 35 also serves the Stanford Shopping Center. Route 89



SOURCE: Fehr & Peers

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Figure 5.15-4
Existing Regional Transit Routes



SOURCE: Stanford University; Fehr & Peers

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Figure 5.15-5
Existing Marguerite Shuttle Routes

provides service between the Palo Alto Veteran's Hospital and California Avenue Caltrain station along Hanover Street. Express bus routes 101, 102, and 103 provide service along Page Mill Road and Hansen Street. Express bus route 104 provides service between the Penitencia Creek Transit Center to Palo Alto along Page Mill Road. Express bus route 182 provides service between IBM/Bailey Avenue and Palo Alto along California Avenue and Hanover Street.

VTA's "Next Network" Transit Service Plan goals are to connect with the new Milpitas and Berryessa BART stations, increase ridership, and improve cost-effectiveness. VTA proposes changes to the existing transit routes for the following route lines by 2018:

- Route 35 will be replaced with new Route 21, operating at a 30-minute frequency every weekday.
- Route 104 will be re-routed to serve Milpitas BART Station rather than Great Mall Transit Center.

San Mateo County Transit (SamTrans)

SamTrans operates fixed route, commuter and paratransit bus service in San Mateo County, and serves the Palo Alto Transit Center with local lines 280, 281, the BART/Caltrain connector routes 297 and 397, and route ECR, which provides service along El Camino Real, making multiple stops at Caltrain and BART stations along the way. Connections to Stanford Shopping Center, which is located one-quarter mile northwest of the Palo Alto Transit Center, are provided by local lines 280, 281, and ECR.

Alameda-Contra Costa Transit District (AC Transit)

AC Transit operates fixed route, commuter, and paratransit bus services in the counties of Alameda and Contra Costa, and serves Stanford with the Dumbarton Express and Line U. The Dumbarton Express operates two lines, Line DB and Line DB1, which provide service between the Union City BART station and Palo Alto, utilizing the Dumbarton Bridge. Line DB serves the Palo Alto Caltrain station and the Stanford Oval, and Line DB1 serves the Stanford Research Park and Veterans Hospital. Line U provides connection between the Fremont BART station, the Stanford Oval and Stanford Shopping Center, with additional stops in the cities of Fremont, Palo Alto and Stanford's campus, including the Fremont/Centerville Amtrak Station and Ardenwood Park & Ride.

City of Palo Alto Shuttle

The free City of Palo Alto Shuttle provides two routes: the Embarcadero Shuttle and the Crosstown Shuttle. On weekdays, both routes serve the Palo Alto Transit Center. The Embarcadero Shuttle provides peak-hour service between the Palo Alto Caltrain Station and the Baylands Business Parks east of US 101/Embarcadero Road. It is coordinated with the Caltrain schedule, serving employers in the East Bayshore area, residents in the Embarcadero Road corridor, and students at Palo Alto High School and Castilleja School. The Crosstown Shuttle connects the University Avenue/Downtown to south Palo Alto and Charleston Road. The Crosstown Shuttle provides access residential neighborhoods, senior residences and services, libraries, recreation centers and commercial districts, and operates a Special School shuttle to help encourage more alternative transportation by students.

City of Menlo Park Shuttle

The free Midday Shuttle Service is operated by City of Menlo Park and provides service between the Palo Alto Transit Center and the Menlo Park Senior Center. Its key stops include Menlo Park Library, Belle Haven Library, Menlo Park Senior Center, downtown Menlo Park, Menlo Park Caltrain station, Menlo Medical Clinic, and Stanford Shopping Center. The Shuttle also connects with the Menlo Park Caltrain Station, SamTrans routes 296, ECR, and KX, and the Stanford Marguerite BOH and X lines.

Stanford Marguerite Shuttle

Stanford's Marguerite Shuttle provides free service to the public accessing many locations on the university campus, as well as the Medical Center, Stanford Shopping Center, SLAC National Accelerator Laboratory, Palo Alto Transit Center, California Avenue Caltrain Station and downtown Palo Alto. Figure 5.15-5 shows the existing Marguerite Shuttle routes, which are also described in more detail below.

- **1050 Arastradero** operates between the Li Ka Shing Center on Campus Drive and 1050/1070 Arastradero.
- **Bohannon (BOH)** provides service between 4100/4700 Bohannon Drive and the Stanford Medical Center (Quarry Extension).
- **East Bay Express** provides service between Campus Oval and the Fremont BART Station.
- **Hospital: Direct (HD)** travels between Searsville Lot on Searsville Road and Hoover PavilionGarage inside Lot 1.
- **Line AE-F** operates between the Fremont BART station and the Stanford Campus Oval.
- **Line C** operates between Vi at Palo Alto on Sand Hill Road and Escondido Village. Line C Limited provides supplemental service between LKSC and Escondido Village via Serra Mall/Serra Street during morning and afternoon peak hours.
- **Line N** (counter-clockwise) and **Line O** (clockwise) travel around campus and Downtown Palo Alto.
- **Line P** provides service between the Palo Alto Transit Center and the Stanford Oval during morning and afternoon peak hours, plus mid-day service.
- **Line S** operates between the Rosewood Hotel and Palo Alto Transit Center.
- **Line X** serves the Palo Alto Transit Center and circulates counter-clockwise through campus. The Line X Limited shuttle provides supplemental service during the morning and afternoon peak times.
- **Line Y** serves the Palo Alto Transit Center and circulates clockwise through campus. The Line Y Limited shuttle provides supplemental service during the morning and afternoon peak times.
- **Medical Center (MC)** provides service between the Palo Alto Transit Center and Lucas Center on Welch Road. Peak hour service is designed to align with the majority ofthe northbound and southbound trains, and mid-day service is coordinated to trains arriving from between 10:00 AM and 3:00 PM.

- **Oak Creek Apartments (OCA)** operates between Tresidder Union on Lagunita Drive and the Oak Creek Apartments Club House.
- **Research Park** operates between the Palo Alto Transit Center and the Research Park during the AM commute times and brings riders back to the Palo Alto Transit Center during the PM commute times.
- **Shopping Express** operates between the Palo Alto Transit Center and the San Antonio Center.
- **SLAC** operates between SLAC National Accelerator Laboratory and Hoover Tower.
- **VA** provides service between Stanford Hospital and the Veterans Administration (VA) Hospital in Palo Alto.

5.15.3 2018 Baseline Environmental Setting

The proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation of the proposed 2018 General Use Permit would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project will be evaluated.

Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of consideration of the proposed 2018 General Use Permit. The notable exception is the planned EV Graduate Residences, which are currently under construction; this housing would not be completed and occupied until approximately 2020. Because the EV Graduate Residences will not be occupied and operational until 2020, operational-related environmental impacts associated with this housing project are not included in the 2018 environmental baseline. Rather, EV Graduate Residences impacts are included in each of the 2035 cumulative scenarios.

There would be incremental increases in traffic on study area roads associated with increases in near-term cumulative development between the existing and 2018 baseline settings. Please refer to Approach to Analysis subsection in Section 5.15.5 for a detailed description for approach used to estimate 2018 trip growth, trip generation and distribution; transportation network improvements; and operating conditions.

5.15.4 Regulatory Setting

Federal

Federal Highway Administration

The Federal Highway Administration (FHWA) is a major agency within the U.S. Department of Transportation. In partnership with State and local agencies, FHWA carries out federal highway programs to meet the nation's transportation needs. FHWA administers and oversees federal highway programs to ensure that federal funds are used efficiently.

Surface Transportation Funding Program (FAST ACT)

On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway infrastructure, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains the focus on safety, keeps intact the established structure of the various highway-related programs the FHWA manages, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

Americans with Disabilities Act of 1990

The Americans with Disabilities Act of 1990 (ADA) (revised 2010) is a landmark civil rights law that prohibits discrimination based on disability. Titles I, II, III, and V of the ADA have been codified in Title 42 of the United States Code, beginning at Section 12101. Title III prohibits discrimination on the basis of disability in "places of public accommodation" (businesses and non-profit agencies that serve the public) and "commercial facilities" (other businesses). The regulation includes Appendix 3.3-A to Part 36 (Standards for Accessible Design), which establishes minimum standards for ensuring accessibility for the disabled when designing and constructing a new facility or altering an existing facility, including roadways, parking lots, and sidewalks. Examples of key guidelines include detectable warnings for pedestrians when entering traffic where there is no curb, a clear zone of 48 inches for the pedestrian travel way, and a vibration-free zone for pedestrians.

State

California Department of Transportation

The California Department of Transportation (Caltrans) has authority over the State highway system, including freeways, interchanges, and arterial routes. Caltrans operates and maintains State highways in Santa Clara County. The Guide for the Preparation of Traffic Impact Studies (Caltrans 2001) provides information that Caltrans uses to review impacts on State highway facilities, including freeway ramps and segments. However, as the Congestion Management Agency for Santa Clara County, VTA is responsible for monitoring operations on Caltrans facilities within Santa Clara County.

State Transportation Improvement Program

The California Transportation Commission (CTC) administers transportation programming, which is the public decision-making process that sets priorities and funds projects that have been envisioned in long-range transportation plans. The CTC commits expected revenues for transportation projects over a multiyear period. The State Transportation Improvement Program (STIP) is a multi-year capital improvement program for transportation projects both on and off

the State Highway System. The STIP is funded with revenues from the State Highway Account and other funding sources. STIP programming typically occurs every two years. The current STIP was adopted in May 2016 and covers fiscal years 2016/17 – 2020/21.

California Transportation Plan

The California Transportation Plan (CTP) 2040 was adopted in June 2016. The CTP, which is overseen by the Caltrans, serves as a blueprint for California's transportation system, as defined by goals, policies, and strategies to meet the State's future mobility needs. The CTP 2040 identifies six goals:

- Improve multimodal mobility and accessibility for all people,
- Preserve the multimodal transportation system,
- Support a vibrant economy,
- Improve public safety and security,
- Foster livable and healthy communities and promote social equity, and
- Practice environmental stewardship.

The CTP 2040 is the first CTP to analyze theoretical statewide transportation scenarios intended to reduce greenhouse gas emissions. Based on this analysis, and the vision and goals of the plan, a set of policies and implementation measures to achieve each goal was developed. Implementation highlights include improving transit, reducing maintenance costs, improving highways and roads with management systems and technology, improving freight efficiency, improving communities through the Sustainable Communities Strategies (SCS), reducing transportation-related deaths and injuries, expanding the use and safety of bike and pedestrian facilities, making our vehicles and transportation fuels cleaner, improving public health and achieving climate and other environmental goals, and securing permanent stable and sufficient transportation revenue.

Senate Bill 375 (SB 375)

SB 375 provides guidance regarding curbing emissions from cars and light trucks to help the State meet its greenhouse gas emissions targets. There are four major components to SB 375. First, SB 375 requires regional greenhouse gas emissions targets for cars and light trucks. The California Air Resources Board's Regional Targets Advisory Committee will guide the adoption of targets to be met by 2020 and 2035 for each Metropolitan Planning Organization (MPO) in the State. These targets, which MPOs may propose themselves, must be updated every eight years in conjunction with the revision schedule of the housing and transportation elements of local general plans.

Second, MPOs are required to create a Sustainable Communities Strategy (SCS) that provides a plan for meeting regional targets. The SCS and the Regional Transportation Plan (RTP) must be consistent, including action items and financing decisions. If the SCS does not meet the regional target, the MPO must produce an Alternative Planning Strategy that details an alternative plan for meeting the target.

Third, SB 375 requires regional housing elements and transportation plans to be synchronized on 8-year schedules. In addition, Regional Housing Needs Assessment (RHNA) allocation numbers must conform to the SCS. If local jurisdictions are required to rezone land as a result of changes in the housing element, rezoning must take place within three years of adoption of the housing element.

Finally, MPOs must use transportation and air emissions modeling techniques that are consistent with the guidelines prepared by the CTC. Regional Transportation Planning Agencies, cities, and counties are encouraged, but not required, to use travel demand models that are consistent with CTC guidelines.

This transportation analysis is based on regional land use forecasts in the Plan Bay Area Sustainable Communities Strategy that are projected to meet the region's SB 375 targets and the VTA-C/CAG 2040 travel demand model, consistent with the CTC RTP guidelines.

Complete Streets (Assembly Bill [AB] 1358)

AB 1358, also known as the California Complete Streets Act of 2008, requires cities and counties to include "complete street" policies in their general plans. These policies address the safe accommodation of all users, including bicyclists, pedestrians, motorists, public transit vehicles and riders, children, the elderly, and the disabled. These policies can apply to new streets as well as the redesign of corridors.

Senate Bill 743 (SB 743)

As explained above (5.15.1, *Introduction – Legal Requirements in Transition*), in 2013 the State enacted SB 743, which started a process intended to fundamentally change transportation impact analysis for purposes of CEQA. These changes include elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts for transit priority areas and infill opportunity zones. The law also gives OPR the option of applying the new thresholds to other areas throughout the State. The State Office of Planning and Research (OPR) has issued draft CEQA Guidelines in response to SB 743, but those amendments have not been finalized or adopted.

SB 743 reflects a Legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions. SB 743 requires the Governor's Office of Planning and Research (OPR) to prepare proposed revisions to the CEQA Guidelines for determining the significance of transportation impacts. Under SB 743, the criteria must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

SB 743 dictates that once the CEQA Guidelines are amended to include new thresholds, automobile delay, as described by level of service or similar measures of vehicular capacity or congestion, shall no longer be considered a significant impact under CEQA in all locations in which the new thresholds are applied. The Legislature gave OPR the option of applying the new thresholds only to transit priority areas, or more broadly to areas throughout the State.

A "transit priority area" is an area within one-half mile of a major transit stop. Public Resources Code section 21064.3 defines a "major transit stop" to mean a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

Pursuant to SB 743, when the Guidelines are finalized, each jurisdiction will need to set new thresholds for transportation impacts based on VMT.

There is no date-certain for formal adoption of regulatory language changes to CEQA, and after formal adoption by the Natural Resources Agency, local jurisdictions/agencies will have a two-year period to transition to the new VMT-based approach. Already, some jurisdictions/agencies (such as Pasadena and San Francisco) have taken the initiative to adopt VMT metrics as the basis for CEQA analysis of transportation impacts.[4]

As an additional component of SB 743, aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area will not be considered significant impacts on the environment

Proposed Amendments to the CEQA Guidelines to Implement SB 743

OPR has issued proposed amendments to the State CEQA Guidelines to implement SB 743. OPR proposes to use automobile Vehicle Miles Traveled, or VMT, as the CEQA transportation metric and to apply the new VMT-based approach to all areas of the State. Agencies would have a two-year period to transition to the new VMT-based approach. Once this transition period ends, automobile delay can no longer be considered a significant adverse effect under CEQA.

The draft amendments to the CEQA Guidelines include a presumption that development projects that are located within one-half mile of an existing major transit stop or a stop along an existing high quality transit corridor will not cause a significant transportation impact. A high-quality transit corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. In its explanation document, OPR notes that this presumption encourages transit oriented development, and "transit-oriented development itself is a key strategy for reducing VMT, and thereby reducing environmental impacts and developing healthy, walkable communities." The draft amendments to the CEQA Guidelines may be found in Attachment A (Proposed 15-day Modifications) to the California Natural Resources Agency Notice of Public Availability of Modifications to Text of Proposed Regulation and Addendum to the Initial Statement of Reasons and Informative Digest (July 2, 2018).

OPR Technical Advisory on Evaluating Transportation Impacts in CEQA

Except for the presumption that projects near major transit stops and high-quality transit corridors will not result in significant impacts, the draft CEQA Guidelines themselves do not set forth specific standards to assess whether a project's VMT effect is significant. Much of the detail is found in a Technical Advisory published by OPR dated April 2018.

[4] Although VMT is not a formal impact topic for Santa Clara County CEQA analyses, potential impacts of the proposed 2018 General Use Permit were evaluated in terms of criteria proposed by OPR to implement SB 743.

Where a development project is not presumed to result in a less-than-significant impact, the draft Technical Advisory recommends thresholds for specific types of land uses, including the following:

- *Residential:* A project exceeding existing regional household daily VMT per capita minus 15 percent may indicate a significant transportation impact.
- *Office*: A project exceeding a level of 15 percent below existing regional daily VMT per employee may indicate a significant transportation impact.
- *Retail*: A net increase in total VMT may indicate a significant transportation impact.
- *Mixed Use*: Lead agencies can evaluate each component independently, and apply the significance threshold for each project type included (e.g. residential and retail). In the analysis of each use, a project may take credit for internal capture.

OPR explains that 15 percent better than existing averages is roughly consistent with the reduction targets set by the California Air Resources Board for the larger metropolitan planning organizations pursuant to SB 375. For development in an unincorporated county, residential VMT that exceeds 15 percent below existing regional daily VMT per capita may indicate a significant transportation impact.

In addition, the draft Technical Advisory suggests screening thresholds to determine whether a quantitative analysis is needed. Agencies could determine not to conduct additional analysis for projects that generate fewer trips than the threshold for studying consistency with a congestion management plan (typically 100 trips). Further, agencies may create maps that identify low-VMT areas and presume that projects in those areas that incorporate features similar to the existing low-VMT development will tend to exhibit similarly low VMT.

In public presentations, OPR has explained that the shift from level of service metrics to VMT will provide important benefits. Elimination of congestion-based metrics can remove a key barrier to infill development. Congestion-based analyses often result in measures to expand roadways and intersections, which result in high capital and maintenance costs. Further, level of service does not equate to quality of life. OPR has shown that level of service metrics do not measure the total amount of time that an individual spends commuting; rather the focus is on delay at a single intersection. Total travel time can be reduced by bringing housing and jobs closer together. According to OPR, VMT-based metrics attack regional congestion and overall driving behavior. Reducing VMT also will reduce greenhouse gas emissions. In addition, OPR has explained that VMT is easier to model than congestion-based approaches.

Regional

Metropolitan Transportation Commission (MTC)

The Metropolitan Transportation Commission (MTC) is the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. MTC collaborates with a network of other public agencies to help support the streets, highways, transit systems and other

transportation resources that help millions of people travel every day. MTC developed and administers the region's long-term regional transportation plan, *Plan Bay Area. Plan Bay Area* was adopted by MTC and the Association of Bay Area Governments (ABAG) in 2013 and projects out to Year 2040. The plan charts the course for transportation investment and land use priorities for the next 25 years. It is the first MTC regional plan to incorporate the state-mandated Sustainable Communities Strategy. On July 26, 2017, MTC and ABAG adopted an update to the plan, Plan Bay Area 2040, which is a limited and focused update of the 2013 plan.

County of Santa Clara

Santa Clara County is the governing jurisdiction for the Stanford academic campus. In addition, the Santa Clara County VTA acts as the County's transportation planning agency, transit services provider, and congestion management agency. The relevant planning documents of these agencies are described below.

Santa Clara County General Plan

The Santa Clara County General Plan strategies and policies relevant to transportation include:

> ***Policy C-TR1*** – Santa Clara County should develop and maintain an adequate, balanced, and integrated transportation system that is affordable and convenient to use and that is capable of meeting projected future demand.
>
> ***Policy C-TR2*** – An adequate transportation system for Santa Clara County should be considered essential for improving overall quality of life, including:
>
> a. continued economic development and increased living standards;
> b. enhanced environmental quality; and
> c. improved livability of urbanized areas.
>
> ***Policy C-TR 3*** – In order to safeguard future mobility and achieve other transportation-related goals and objectives stated in the Vision of the General Plan, the following set of coordinated strategies should guide decision-making and implementation efforts on a sub-regional basis:
>
> a. develop urban land use patterns that support travel alternatives;
> b. manage travel demand, system operation, and congestion levels;
> c. expand system capacity and improve system integration; and
> d. support new transportation technologies.

Strategy #1: Develop land use patterns that support travel alternatives.

> ***Policy C-TR 4*** – Overall transportation planning for Santa Clara County should be integral and consistent with the goals and objectives of comprehensive, countywide planning regarding urban growth management, compact and mixed use development patterns, environmental quality, and social and economic well-being.
>
> ***Policy C-TR 5*** – The transportation plans and the land use plans, specific plans, and redevelopment plans of local jurisdictions should be consistent and mutually reinforcing in order to enhance transportation infrastructure investment.

Policy C-TR 6 – Increase the proximity between housing and major employment areas to reduce commute distances and automobile-dependency by:

a. increasing supply and affordability of units in northern portions of the county, as well as increasing employment-related land uses in the southern portion of the metropolitan area;

b. applying the concepts of "balanced urban growth and development" in general to both the north and south valley areas;

c. encouraging developers and employers to build on-site or near-site housing for potential workers at a planned commercial or industrial site, the cost of which is matched to the workers' wages;

d. encouraging developers to provide pedestrian and bicycle paths that connect housing and employment sites so as to encourage walking and bicycling.

Policy C-TR 7 – Appropriate urban densities, mixed-use development patterns, and other aspects of urban development which support use of travel alternatives and reduce auto-dependency should be employed along planned transportation corridors, within designated "urban activity centers," and within redeveloping areas of existing cities.

Policy C-TR 8 – Urban design concepts and site development standards which facilitate use of transit and other travel alternatives should be adopted and implemented by local jurisdictions, to provide adequate:

a. accessibility to transit and transit facilities;

b. pedestrian and bicycle pathways and facilities, both on and between individual sites; and

c. building design, orientation, on-site services and amenities which support the use of travel alternatives

Strategy #2: Manage travel demand, system efficiency, and congestion.

Policy C-TR 9 – Transportation Demand Management (TDM) measures should be employed to make more efficient use of existing road and highway capacity by increasing vehicle occupancy and reducing the need for commute and other trips. Such measures primarily include, but are not limited to the following:

a. employer-based and school-based ridesharing programs;

b. vanpooling;

c. expanded use of flex-time and telecommuting; and

d. transit subsidies, reduced parking, and other "market" approaches.

Policy C-TR 10 – Transportation System Management (TSM) measures should be employed to ensure maximum operating efficiency of the existing system of roads and highways, including but not limited to the following:

a. signal synchronization, signal pre-emptions for transit vehicles;

b. ramp metering; and

c. traffic surveillance and traffic advisory signs.

Policy C-TR 11 – Santa Clara County shall participate in updating and implementing the Congestion Management Plan, the provisions of which as set forth by law:

a. establish priority for air quality goals and objectives and development of alternatives to automobile travel; and

b. allow additional road capacity to be created only when all feasible automobile travel demand measures have been implemented.

Policy C-TR 12 – It is the goal of this plan to achieve a level-of-service (LOS) no lower than D at peak travel periods on city streets, county roads, expressways and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D cannot practically be achieved.

Policy C-TR 13 – Support and encourage the writing and implementation of deficiency plans for segments of the Congestion Management Plan designated transportation system that do not operate within the CMP LOS standard or are expected to not operate within the CMP LOS standard. Deficiency plans should focus on and give strong support to the use of existing and planned transit facilities.

Policy C-TR 14 – Reduce the number of workers who must drive by increasing the opportunities to telecommute; support and encourage the development and implementation of employer-based telecommuting programs.

Strategy #3: Expand system capacity and improve system integration.

Policy C-TR 15 – Increase the overall physical capacity of the transportation system to meet projected demand, primarily through the following means:

a. increased transit system capacity and service levels for light rail, passenger rail, and bus transit;

b. increased paratransit, bike and pedestrian facilities and service; and

c. roadway capacity improvements to improve interchanges and complete the commuter lane network.

Policy C-TR 16 – Provide a balanced and integrated transportation system, which will allow for alternative means of travel and opportunities for transfer between alternative means.

Policy C-TR 17 – Development of the local transportation system should be coordinated with the regional and inter-regional transportation systems to ensure that they are fully integrated with each other.

Policy C-TR 18 – The entire transportation system should be fully accessible to and be planned and designed to be responsive to the special needs of seniors, school children, low-income, the physically challenged and transit disabled in accordance with the Americans with Disabilities Act of 1990.

Policy C-TR 21 – Local transit systems should be integrated with the local and regional transit systems of adjacent counties.

Policy C-TR 25 – Priority should be given to sustaining a base level of service on major grid bus lines.

Policy C-TR 26 – The County's bus system should be expanded as funding allows. Expansion of the bus system shall emphasize improving service on existing routes. It

should also emphasize express bus service to major employment centers, shuttle service to major activity centers, feeder buses to BART, Caltrain and light rail stations, and bus service to schools within urban service areas.

Policy C-TR 27 – Use and efficiency of the bus system should be maximized.

Policy C-TR 28 – Provide and maintain paratransit and fixed route transit services that fulfill the objectives of the Transit District Paratransit Plan and meet the requirements of the Americans with Disabilities Act of 1990.

Policy C-TR 29 – Improve transit accessibility to schools.

Policy C-TR 34 – Bicycling and walking should be encouraged and facilitated as energy conserving, nonpolluting alternatives to automobile travel.

Policy C-TR 35 – A bicycle transit system should be provided that is safe and convenient for the user and which will provide for the travel needs of bicyclists.

Policy C-TR 36 – Facilities should be provided to make bicycle and pedestrian travel more safe, direct, convenient and pleasant for commuting and other trips to activity centers and to support the use of other commute alternatives.

Strategy #4: Support new transportation technologies.

Policy C-TR 42 – Development and application of advanced transportation-related technologies should be supported to meet current and future travel demand, minimize economic productivity losses due to roadway congestion, and increase travel safety.

Stanford Community Plan

The Stanford Community Plan (December 2000) is a component of the Santa Clara County General Plan. The Stanford Community Plan provides the County General Plan policies for Stanford's academic campus. The Circulation chapter of the plan provides a description of the transportation network and services on the campus, and defines strategies, policies, and implementation steps related to transportation. The three strategies and associated policies and implementation steps are listed below.

Strategy #1: Achieve no net new commuter trips through land use and transportation demand management.

Policy SCP-C 1 – Apply a "no net new commute trips" standard for campus-related trips in the commute direction during peak hours to the fullest extent allowed by law.

Policy SCP-C 2 – Within the overall pattern of land uses on the campus, promote a development pattern that supports reduction in automobile dependency through the following approaches:

- New academic and residential development shall occur within the Academic Growth Boundary.
- Support services for campus residents and employees should be accommodated in close proximity to residential and academic facilities.

- New development should be located near existing transit services, particularly if extension of transit service to the new facilities would otherwise be infeasible or impractical.

Policy SCP-C 3 – Encourage addition of housing in locations convenient to jobs on Stanford land in other jurisdictions, such as near the Stanford Medical Center.

Policy SCP-C 4 – Enhance pedestrian and bicycle access to and through the campus.

Policy SCP-C 5 – Permit and encourage regular modification of Stanford's Transportation Demand Management (TDM) program to allow for changes in user needs and in available services over time.

Policy SCP-C 6 – Continue to regulate parking supply as a mechanism for transportation demand management, while avoiding "spillover" of parking into neighborhoods adjacent to the campus. Over time, require Stanford to maintain a consistent level of parking in proportion to students, faculty and staff, as compared to the current ratio of 1.03 spaces per student, faculty and staff member.

Policy SCP-C 7 – In addition to meeting the no net new commute trips standard, encourage Stanford to reduce automobile travel at non-commute hours and in non-commute directions, such as traffic associated with lunchtime activities by employees or travel by families of on-campus residents

Policy SCP-C 8 – Credit participation in off-campus trip reduction efforts that benefit the streets surrounding the campus towards Stanford's achievement of the "no net new commute trips" standard.

Implementation Recommendations:

SCP-C (i) 1 – Adopt and maintain zoning regulations that allow for a mix of land uses in academic and residential areas in order to reduce the need for automobile use on and off the campus.

SCP-C (i) 2 – Locate supporting services such as day care and convenience retail in new and existing graduate student and faculty/staff residential neighborhoods. Particularly review for provision of support services in applications for substantial new residential development.

SCP-C (i) 3 – Review development project applications for access to and integration with the overall system of pedestrian bikeways and pathways on the Stanford campus. Particularly consider this issue for development along the Quarry Road corridor with regard to enhancement of pedestrian access to the Palo Alto lntermodal Transit Center.

SCP-C (i) 4 – Establish a system for direct, independent, and verifiable monitoring of Stanford's level of achievement with the "no net new commute trips" standard through the annual monitoring procedure.

SCP-C (i) 5 – Review the Transportation Demand Management system on an annual basis and consult with Stanford, and adjacent communities as appropriate, to ensure that new needs or opportunities are considered. Incorporate the following considerations into the review process:

- TDM strategies should serve to reduce the number of cars entering the campus during the morning peak hour and leaving during the evening peak hour.
- Programs serving intra-campus or off-peak travel should be primarily aimed at making it possible for employees and residents to conduct their daily activities without a car.

SCP-C (i) 6 – Encourage Stanford to identify opportunities and develop proposals for participation in off-campus trip reduction efforts. Assess the expected effectiveness of the proposed programs, and apply trip reduction credits to the annual calculation of Stanford's compliance with the "no net new commute trips" standard.

Strategy #2: Alleviate local congestion in the context of commute trip reduction.

Policy SCP-C 9 – Maintain consistency with the procedures and adopted policies of the appropriate jurisdiction when evaluating local intersection service levels and defining mechanisms for addressing impacts.

Policy SCP-C 10 – Modify street and intersection capacity and configuration in a manner consistent with the street hierarchy and surrounding land uses.

Policy SCP-C 11 – Prioritize use and improvement of the internal campus circulation system over roadways on the campus edges.

Policy SCP-C 12 – Consult with jurisdictions surrounding the campus regarding the potential non-commute traffic impacts of new development and activities at Stanford, and work with the jurisdictions to reduce potential effects on neighborhoods surrounding the campus.

Policy SCP-C 13 – Identify opportunities to improve access and circulation for pedestrians, transit and bicycles instead of or in addition to system expansions that accommodate automobiles.

Implementation Recommendations:

SCP-C (i) 8 – Require street system expansions on the campus that will ease traffic flow and internal circulation, particularly in situations where such capacity expansion would make on-campus routes preferable to off-campus roadways.

SCP-C (i) 9 – If Stanford does not meet the "no net new commute trips" goal for new development on campus, require Stanford's contribution toward intersection improvements at impacted locations or equivalent funding toward other transportation impact mitigation efforts, to a degree proportional to the effect of the new development on future traffic levels. If Stanford does not either meet the no net new commute trips goal or contribute proportional funding toward intersection improvements or equivalent funding for transportation mitigation efforts, do not grant additional development permits until Stanford meets the established requirements.

SCP-C (i) 10 – Negotiate renewal of agreements with the City of Palo Alto for the management of traffic associated with special events.

SCP-C (i) 11 – Cooperate with the Congestion Management Agency in implementing deficiency plans, where needed, for Congestion Management Program system roadways and intersections in proximity to the Stanford campus.

SCP-C (i) 12 – Consider redesign of Junipero Serra Boulevard in order to reduce speeding, enhance bicycle, pedestrian and motorist safety, recognize the needs of residents taking access from the street, improve migration opportunities for the California tiger salamander, and maintain the scenic character of the roadway, without substantially affecting traffic volumes. Pursue redesign through cooperative efforts among the County, Stanford, and local residents, as well as other agencies as appropriate.

SCP-C (i) 13 – Work cooperatively with surrounding jurisdictions to develop solutions to regional transportation problems.

Strategy #3: Alleviate local congestion from special events.

***Policy* SCP-C 14 –** Identify opportunities to promote the use of public transit for special events at Stanford.

***Policy* SCP-C 15 –** Work with neighboring jurisdictions to manage special event traffic.

***Policy* SCP-C 16 –** Provide advance notification of events expected to draw large crowds to on-campus residents and the surrounding community.

***Policy* SCP-C 17 –** Consult with jurisdictions surrounding the campus regarding the potential non-commute traffic impacts of new development and activities at Stanford, and work with the jurisdictions to reduce potential effects on neighborhoods surrounding the campus.

Implementation Recommendations:

SCP-C (i) 14 – Require Stanford to institute a special events hotline and website that on-campus residents and the general public can contact for information regarding upcoming special events.

SCP-C (i) 15 – Require Stanford to provide the public with notice of special events in two newspapers of local circulation in the Palo Alto and Menlo Park area.

SCP-C (i) 16 – Negotiate renewal of agreements with the City of Palo Alto for the management of traffic associated with special events.

Santa Clara County Valley Transportation Authority (VTA)

VTA is an independent special district that provides bus, light-rail, and paratransit services, and participates as a funding partner in regional rail service including Caltrain, Capital Corridor, and the Altamont Corridor Express. As the County's congestion management agency, VTA is responsible for countywide transportation planning, including congestion management, design and construction of specific highways, pedestrian, and bicycle improvement projects, as well as promotion of transit oriented development. VTA provides these services throughout the county, including the municipalities of Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga and Sunnyvale.

Valley Transportation Plan 2040

The VTA's current long-range transportation plan is the draft *Valley Transportation Plan (VTP) 2040,* adopted in October 2014. The three objectives of the plan are:

- To facilitate the creation and support of an integrated multimodal transportation system that serves all socio-economic groups efficiently and sustainably;
- To pursue, develop, and implement advances in technology, management practices, and policies; and
- To be the region's foremost advocate for transportation projects, programs, and funding.

The plan highlights the projects and programs that will be pursued in partnership with member agencies in the next 25 years. Some of the types of projects being pursued are complete streets, express lanes, bus rapid transit, and bicycle/pedestrian improvements.

Congestion Management Plan

VTA also functions as the County's congestion management agency, and maintains and implements the Congestion Management Program (CMP). The current document, the *2015 Congestion Management Plan*, was adopted in October 2015. This document includes updates to previous standards and practices, including an emphasis on multimodal analysis and the renaming of the Deficiency Plan Element to the Multimodal Improvement Plan Element to reflect the need to shift travelers from autos. The CMP System includes a roadway network, a transit network, and a bicycle network. The roadway network includes freeways, expressways and principal arterials. Within the transportation study area, CMP facilities include US 101, I-280, El Camino Real (SR 82), University Avenue, Alma Avenue, Junipero Serra Boulevard – Foothill Expressway, Page Mill Road – Oregon Expressway, and San Antonio Road (2015 CMP, Figures 1.2 and 1.3). Therefore, a portion of the study intersections in the transportation analysis are CMP intersections. The CMP transit network and bicycle network are shown in CMP Figures 1.4 and 1.5, respectively.

The CMP currently identifies 11 multimodal transportation system performance measures for the CMP networks, including:

- traffic level of service (LOS),
- modal split,
- VMT per person-trip,
- transit accessibility,
- air quality,
- duration of congestion,
- hours of delay per person trip,
- travel time and travel time index,
- transit sustainability policy,
- travel pattern (in person trips), and
- use of the VTA TIA Guidelines.

Most of these are applied and measured system-wide or in individual "travel markets"; the traffic LOS measure is measured for freeway segments, intersections, and rural highways.

Countywide Bicycle Plan

In 2008, VTA completed the *Santa Clara Countywide Bicycle Plan* (SCCBP), which provides a foundation for maintaining and enhancing the countywide bicycle network. The County is in the

process of updating this document to incorporate the advances in bicycle infrastructure design and cultural shift toward bicycling. The vision of the SCCBP is to establish, protect, and enhance bicycling as a viable transportation mode and to assure that bicycling is a practical and safe mode of travel, by itself and in combination with other modes.

The VTA's Bicycle Expenditure Program (BEP) was created to provide a funding stream to implement the SCCBP. In May 2013, the VTA Board adopted the BEP Project List for inclusion in the 2040 Santa Clara County LRTP. The LRTP identifies seven specific bicycle infrastructure projects near the Stanford campus. These projects are:

- **Palo Alto Bicycle Boulevard Network Project:** Expand the Bicycle Boulevard Network pursuant to the adopted bicycle plan.
- **Palo Alto Transit Center/University Avenue Undercrossing:** Construct a new bicycle/pedestrian undercrossing of Caltrain tracks, near Everett Street or Lytton Street in order to connect Downtown with Stanford University and Medical Center, and the multi-modal transit center.
- **Sand Hill Road/I-280 Interchange Bicycle Improvements:** Provide general multi-modal access improvements at the Sand Hill Road / I-280 Interchange. This bicycle improvement project is taken from the Draft *Expressway Plan 2040.*
- **Page Mill Road/I-280 Interchange Modification:** Modify the ramp configurations from Old Page Mill Road to Arastradero Road in order to enhance safe passage for bicyclists through the interchange area.
- **California Avenue Caltrain Undercrossing:** Replace the California Avenue bicycle/pedestrian undercrossing of Caltrain tracks with a new ADA compliant structure.
- **South Palo Alto Caltrain Pedestrian/Bicycle Grade Separation:** Construct a grade separated bicycle/pedestrian crossing between the California Avenue Caltrain station and the at-grade crossing on East Meadow Drive.
- **US 101/Adobe Creek Bicycle-Pedestrian Bridge and Adobe Creek Trail Extension:** Construct a year-round, Class I overcrossing of Highway 101 to replace the existing, seasonal Lefkowitz Tunnel. Extend Adobe Creek Trail between West Bayshore Road and Louis Road.
- **Adobe Creek Reach Trail:** West Bayshore Road to Louis Road.

Implementation timeframes for these projects vary based upon the agencies involved; however, all are anticipated to be fully programmed and/or completed by 2040, per the VTA's 2040 LRTP.

City/County Association of Governments of San Mateo County (C/CAG)

The C/CAG operates as a Joint Powers Authority and has members that include each of the 20 cities in the county as well as the County. C/CAG functions as the County's congestion management agency, and as such, maintains, implements and periodically updates the County's Congestion Management Program.

2015 Congestion Management Plan (CMP)

The first CMP for San Mateo County was adopted by C/CAG in 1991 and was last updated in 2015, with monitoring reports provided every two years. The overall goal is to help C/CAG promote countywide solutions to transportation problems based upon cooperation and mutual support.

The latest monitoring report, *Final San Mateo County Congestion Management Program, 2015* was adopted in November 2015. The CMP network in the TIA study area includes US 101, I-280, and El Camino Real (State Route 82). The LOS standards for these facilities within the study area range from LOS D to LOS F (2015 CMP, Figure 4). In addition to roadway segment standards, the CMP identifies key intersections on the network, two of which are included in the analysis: Bayfront Expressway/Willow Road and Bayfront Expressway/University Avenue. The CMP LOS standard for these intersections is LOS F (2015 CMP, Table 3).

San Mateo County Comprehensive Bicycle and Pedestrian Plan

C/CAG and the San Mateo County Transportation Authority (SMCTA) developed the 2011 San Mateo County Comprehensive Bicycle and Pedestrian Plan (CBPP) to address the planning, design, funding, and implementation of bicycle and pedestrian projects of countywide significance. The CBPP identifies five specific bikeway and pedestrian network projects, which includes over/undercrossing, arterial crossing and interchange improvement projects, near the Stanford campus and in the City of Menlo Park. These projects were categorized based on criteria used to score and sort each project: collision history, transit access, population and employment density, and location in an underserved community. These projects are:

- **El Camino Real**: Construct a Class II linear bikeway along El Camino Real for 0.33 mile between Alejandra Avenue and Valparaiso Avenue.
- **El Camino Real**: Construct a Class III linear bikeway along El Camino Real for 1.05 miles between Valparaiso Avenue and Santa Clara County Line.
- **University Drive**: Construct a Class III linear bikeway along University Drive for 1.08 miles between Valparaiso Avenue to Santa Clara County.
- **Near Middle Avenue at Highway 82**: Construct an undercrossing near Middle Avenue at Highway 82/El Camino Real.
- **San Mateo Drive**: Construct a Class III linear bikeway along San Mateo Drive between Valparaiso Avenue to Santa Clara County Line.

Local Regulations

Most of the transportation study area falls within the Cities of Palo Alto, Menlo Park, and East Palo Alto. The following sections discuss the transportation policies of these cities.

City of Palo Alto Comprehensive Plan

The current *City of Palo Alto Comprehensive Plan* (which serves as the City's general plan) was last updated in 2007, with a land use map update in 2011. The City of Palo Alto is in the process of updating their Comprehensive Plan, a process that has been underway since 2014 and is

expected to conclude in 2017. The transportation element of the update has not yet been prepared. The 2007 Comprehensive Plan Transportation Element contains goals, policies and programs designed to guide the development, operations and maintenance of the transportation facilities. The ten goals are listed below:

Goal T-1: Less reliance on single-occupant vehicles

Goal T-2: A convenient, efficient public transit system that provides a viable alternative to driving

Goal T-3: Facilities, services, and programs that encourage and promote walking and bicycling

Goal T-4: An efficient roadway network for all users

Goal T-5: A transportation system with minimal impacts on residential neighborhoods

Goal T-6: A high level of safety for motorists, pedestrians, and bicyclists on Palo Alto streets

Goal T-7: Mobility for people with special needs

Goal T-8: Attractive, convenient public and private parking facilities

Goal T-9: An influential role in shaping and implementing regional transportation decisions

Goal T-10: A local airport with minimal off-site impacts

The Palo Alto Comprehensive Plan Transportation Element does not provide performance standards or significance thresholds for vehicle traffic operations or the performance of the systems serving other travel modes. However, the City has historically used Level of Service (LOS) D as the traffic LOS standard. The Transportation Element has the following policies regarding the development of the transportation network, which are relevant to the feasibility and design of mitigation that may be identified to address impacts of the proposed 2018 General Use Permit.

Policy T-14 – Improve pedestrian and bicycle access to and between local designations, including public facilities, schools, parks, open space, employment districts, shopping centers, and multimodal transit stations.

Policy T-25 – When constructing or modifying roadways, plan for usage of the roadway space by all users, including motor vehicles, transit vehicles, bicyclists and pedestrians.

Policy T-27 – Avoid major increases in street capacity unless necessary to remedy severe traffic congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists.

Policy T-28 – Make effective use of the traffic-carrying capacity of Palo Alto's major street network without compromising the needs of pedestrians and bicyclists also using this network.

Policy T-31 – Evaluate smoothing and slowing traffic flow in commercial areas by reducing through-traffic lanes and trading the area for improved turning lanes, landscaping, and bicycle lanes.

Policy T-34 – Implement traffic calming measures to slow traffic on local and collector residential streets and prioritize these measures over congestion management. Include traffic circles and other traffic calming devices among these measures.

Policy T-39 – To the extent allowed by law, continue to make safety the first priority of citywide transportation planning. Prioritize pedestrian, bicycle, and automobile safety over vehicle level-of-service at intersections.

City of Menlo Park General Plan

Menlo Park recently completed a General Plan update ("*ConnectMenlo*"), initiated in March 2013 and finalized November 29, 2016. The updated Plan replaces the previous General Plan adopted in 1994 and last amended in 2013. *ConnectMenlo* contains circulation and transportation policies; a circulation plan diagram and standards; and circulation and transportation proposals and implications. One of the Guiding Principles was:

Great Transportation Options – "Menlo Park provides thoroughly-connected, sage and convenient transportation, adequate emergency vehicles access, and multiple options for people travelling by foot, bicycle, shuttle, bus, car, and train, including daily service along the Dumbarton Rail Corridor."

The following seven circulation and transportation goals are included in the Circulation Element:

Goal CIRC-1 – **Safe Transportation System.** Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Goal CIRC-2 – **Complete Streets.** Increase accessibility for and use of streets by pedestrians, bicyclists and transit riders.

Goal CIRC-3 – **Sustainable Transportation.** Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Goal CIRC-4 – **Health and Wellness.** Improve Menlo Park's overall health, wellness, and quality of life through transportation enhancements.

Goal CIRC-5 – **Transit.** Support local and regional transit that is efficient, frequent, convenient, and safe.

Goal CIRC-6 – **Transportation Demand Management.** Provide a range of transportation choices for the Menlo Park community.

Goal CIRC-7 – **Parking.** Utilize innovative strategies to provide efficient and adequate vehicle parking.

The Circulation Element describes the circulation plan diagram, which includes a description of the street classification system and mode priority and guidelines (Circulation Element Figure 2); bicycle standards and proposed improvements (Circulation Element Figure 3); and transit system improvements (Circulation Element Figure 4). The *ConnectMenlo* Environmental Impact Report (EIR) includes the mitigation that includes the preparation of Transportation Master Plan to identify needed roadway and other transportation improvements.

The Circulation Element contains Policy CIRC-3.4 which defines the City's intersection LOS standard as follows:

> ***Policy CIRC-3.4*** – **Level of Service.** Strive to maintain level of service (LOS) D at all City-controlled signalized intersections during peak hours, except at the intersection of Ravenswood Avenue and Middlefield Road and at intersections along Willow Road from Middlefield Road to US 101. The City shall work with Caltrans to ensure that average stopped delay on local approaches to State-controlled signalized intersections does not exceed LOS E.

The Circulation Element has the following policies regarding the development of the transportation network, which are relevant to the feasibility and design of mitigation that may be identified to address impacts of the proposed 2018 General Use Permit.

> **Policy CIRC 1.7** – **Bicycle Safety.** Support and improve bicyclist safety through roadway maintenance and design efforts.
>
> ***Policy CIRC-1.8*** – **Pedestrian Safety.** Maintain and create a connected network of safe sidewalks and walkways within the public right of way ensuring that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations.
>
> ***Policy CIRC-2.1*** – **Accommodating All Modes.** Plan, design and construct transportation projects to safely accommodate the needs of pedestrians, bicyclists, transit riders, motorists, people with mobility challenges, and persons of all ages and abilities.
>
> ***Policy CIRC-2.7*** – **Walking and Biking.** Provide for the safe, efficient, and equitable use of streets by pedestrians and bicyclists through appropriate roadway design and maintenance, effective traffic law enforcement, and implementation of the City's Transportation Master Plan (following completion; until such time the Comprehensive Bicycle Development Plan, Sidewalk Master Plan and the El Camino Real/Downtown Specific Plan represent the City's proposed walking and bicycling networks).
>
> ***Policy CIRC-2.8*** – **Pedestrian Access at Intersections.** Support full pedestrian access across all legs of signalized intersections.
>
> ***Policy CIRC-2.9*** – **Bikeway System Expansion.** Expand the citywide bikeway system through appropriate roadway design, maintenance, effective traffic law enforcement, and implementation of the City's Transportation Master Plan (following completion; until such time the Comprehensive Bicycle Development Plan and the El Camino Real/Downtown Specific Plan represent the City's proposed bicycle network).
>
> ***Policy CIRC-3.1*** – **Vehicle-Miles Traveled.** Support development and transportation improvements that help reduce per service population (or other efficiency metric) vehicle miles traveled.
>
> ***Policy CIRC-3.3*** – **Emerging Transportation Technology.** Support efforts to fund emerging technological transportation advancements, including connected and autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

City of East Palo Alto General Plan

The City of East Palo Alto just completed a General Plan update, as its previous General Plan was adopted in 1999. The *Vista 2035 – East Palo Alto General Plan Public Draft* was released in January 2016, and the Final EIR was released on August 2016. The City adopted the General Plan on October 6, 2016.

The updated General Plan Transportation Element contains the following transportation goals:

> ***Goal T-1:*** Improve safety through the design and maintenance of sidewalks, streets, intersections, and other roadway improvements.
>
> ***Goal T-2:*** Foster the creation of complete, multimodal streets.
>
> ***Goal T-3:*** Create a complete, safe and comfortable pedestrian network for people of all ages and abilities.
>
> ***Goal T-4:*** Build a comprehensive and well-used bicycle network that comfortably accommodates bicyclists of all ages and skill levels.
>
> ***Goal T-5:*** Support local and regional transit that is efficient, frequent, convenient, and safe.
>
> ***Goal T-6:*** Develop strategies to provide efficient and adequate vehicle parking.
>
> ***Goal T-7:*** Adopt transportation performance measures.
>
> ***Goal T-8:*** Adopt transportation demand management and roadway system efficiency strategies.

The Transportation element has the following two policies related to level of service standards and transportation performance measures:

> ***Policy 7.1*** – **Automobile Level of Service Standards.** Improve the East Palo Alto circulation system roadways in concert with land development to maintain adequate levels of service for automobile travel. Automobile Level of Service (LOS) performance can be measured using a volume-to-capacity (V/C) ratio. V/C ratios are calculated based on existing or future average daily traffic (ADT) volumes and daily capacity values for various types of roadways. A level of service scale is used to evaluate roadway performance based on V/C ratios. These levels range from "A" to "F", with LOS A representing free flow conditions and LOS F representing severe traffic congestion. Descriptions of traffic flow for the different levels of service are provided in the table entitled Standards for Roadway Levels of Service. The performance criteria for evaluating volumes and capacities of the East Palo Alto roadway system is LOS D. At a signalized intersection, an impact is considered significant if it causes operations to degrade from LOS D or better to LOS E or F; or exacerbates LOS E or F conditions by increasing critical delay by more than 4 seconds and increasing V/C ratio by 0.01; or increases the V/C ratio by more than 0.01 at an intersection that exhibits unacceptable operations, even if the calculated LOS is acceptable. At an unsignalized intersection, an impact is considered significant if it: causes operations to degrade from LOS D or better to LOS E or F; or exacerbates LOS E or F conditions by increasing control delay; or causes volumes under project conditions to exceed the Caltrans Peak Hour Volume Warrant Criteria. Where the City determines that proposed development projects will cause LOS standards to be exceeded, appropriate mitigation will be required to improve roadways to meet LOS standards.

Policy 7.2 – **Updating Transportation Performance Measures.** Update the transportation performance measures in this Transportation Element, including Automobile Level of Service standards, once the State of California has amended the California Environmental Quality Act Guidelines to implement Senate Bill 743's requirement to provide an alternative to automobile Level of Service for evaluating transportation impacts (See California Public Resources Code Section 21099(b)(1).) Additionally, designate appropriate infill opportunity zones within East Palo Alto, within which the automobile Level of Service standards prescribed by California Government Code Section 65089 shall not apply. (See Government Code Sections 65088.1 and 65088.4.)

The Transportation Element has the following policies regarding the development of the transportation network, which are relevant to the feasibility and design of mitigation that may be identified to address impacts of the proposed 2018 General Use Permit.

Policy 2.1 – **Accommodating all modes.** Plan, design and construct transportation projects to safely accommodate the needs of pedestrians, bicyclists, transit riders, motorists, people with disabilities, and persons of all ages and abilities.

Policy 2.2 – **University Avenue.** As the main transportation spine of East Palo Alto, ensure that any future redesign of University Avenue include improvements for all modes of travel, focusing on its local function as a community centerpiece for local activity and travel. Design options could include buffered and painted bicycle lanes, streetscape improvements such as benches and pedestrian scale lighting, and mid-block crossings, reversible lanes, and the reintroduction of on-street parking. The City shall maintain control of University Avenue (not Caltrans).

Policy 2.6 – **Pedestrian and bicycle crossings**. Encourage pedestrian and bicycle crossings at key locations and across existing barriers such as Highway 101 and to local employment and schools, such as Bay Road.

Policy 3.3 – **Pedestrian network.** Create a safe, comfortable and convenient pedestrian network that focuses on a) safe travel; b) improving connections between neighborhoods and commercial areas, and across existing barriers; c) providing places to sit or gather, pedestrian-scaled street lighting, and buffers from moving vehicle traffic; and d) includes amenities that attract people of all ages and abilities.

Policy 4.1 – **Bicycle network.** Improve facilities and eliminate gaps along the bicycle network to connect destinations across the city and create a network of bicycle facilities of multiple types that connect to neighboring cities, including a path along Newell Road between Highway 101 and San Francisquito Creek. The network should facilitate bicycling for commuting, school, shopping, and recreational trips by riders of all ages and levels of experience.

Policy 5.4 – **Access to transit.** Provide connecting bicycle and pedestrian infrastructure and amenities to improve access to transit stations and stops, and encourage new development projects near transit to improve transit stop amenities.

Policy 8.2 – **Avoidance of street widening.** When feasible, avoid widening streets to increase automobile capacity, focusing instead on operational improvements such as signal timing optimization, modern roundabouts and other Transportation Systems Management (TSM) strategies that aim to improve traffic conditions and reduce cut-through traffic by maximizing the efficiency of existing vehicle infrastructure.

5.15.5 Impacts and Mitigation Measures (Other than VMT)

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the proposed Project would have a significant impact on transportation and traffic if it would:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

e) Result in inadequate emergency access; or

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Please see section 5.15-6, below, for a discussion of significance criteria pertaining to VMT. Also, please see sections 5.15-7 and 5.15-8, below, for information regarding transit and bicycle facility capacity, on-campus parking supply, and off-site parking restrictions.

Thresholds of Significance

Signalized Intersections

Operations and impacts are evaluated based on the appropriate jurisdiction's LOS standards (i.e., minimum threshold for acceptable operations) as shown in **Table 5.15-9**. An impact is significant if the addition of Project traffic causes an acceptable LOS to fall to an unacceptable LOS, or exceeds the thresholds in Table 5.15-9 for intersections that already would be at an unacceptable LOS without the Project.

There are signalized study intersections in ten different jurisdictions including six cities, two counties, and two congestion management programs. The level of service (LOS) operations of the signalized intersections were evaluated using the method described in the 2000 *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000). This LOS method, which is approved by Santa Clara County and VTA, analyzes a signalized intersection's operation based on average control delay per vehicle. LOS definitions are shown in **Table 5.15-10**.

TABLE 5.15-9
SIGNALIZED INTERSECTION LEVEL OF SERVICE STANDARDS

Jurisdiction	Intersection LOS Standards (minimum acceptable LOS)	Thresholds of Significance if LOS Standard is Exceeded Without the Project
Santa Clara County	LOS E	Increases the average critical delay by more than four seconds and increases the critical volume-to-capacity (V/C) ratio by 0.01 or more; OR increases the V/C ratio by 0.01 or more when the critical delay is decreased.
VTA Congestion Management Program (CMP)	LOS E	Increases the average critical delay by more than four seconds and increases the critical volume-to-capacity (V/C) ratio by 0.01 or more; OR increases the V/C ratio by 0.01 or more when the critical delay is decreased.
San Mateo County	• Outside dense urban areas: LOS C, with no individual movement at worse than LOS D. • Within dense urban areas: LOS D	• Increases the average critical delay by more than four seconds • Increases the average critical delay by more than four seconds
C/CAG Congestion Management Program (CMP)	LOS F for the two C/CAG CMP intersections within the study area	Increases the average critical delay by four seconds or more
City of Menlo Park	• LOS C for collector street intersections. • LOS D for all arterial streets or local approaches to State-controlled signalized intersections.	• Increases the average delay by more than 0.8 second on all critical movements for intersections on a collector or arterial. • Increases the average delay by more than 0.8 second on any critical movement that is located on the local approach to a State-controlled intersection. Note: Increases vehicle delay by 23 seconds or more at an intersection that would continue to operate at an acceptable LOS
Cities of Palo Alto, East Palo Alto, Mountain View and Los Altos, and Town of Atherton	LOS D	Increases the average critical delay by more than four seconds and increases the critical volume-to-capacity (V/C) ratio by 0.01 or more; OR increases the V/C ratio by 0.01 or more when the critical delay is decreased.

SOURCES: Santa Clara County General Plan, 1994;
Santa Clara County Annual Monitoring and Conformance Report, 2014; and Traffic Impact Study Requirements, 2013;
San Mateo County 2015 Congestion Management Program;
Palo Alto 2007 Comprehensive Plan working documents; and Staff Report #6805, 2016;
Menlo Park Transportation Impact Analysis Guidelines, 2014;
City of East Palo Alto General Plan Update EIR, 2016;
City of Mountain View 2030 General Plan and Greenhouse Gas Reduction Program EIR, 2012; and
City of Los Altos General Plan, 2002.

TABLE 5.15-10
DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCES: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

Unsignalized Intersections

None of the applicable jurisdictions have an officially adopted significance criterion for unsignalized intersections. For purposes of this analysis, significant impacts are defined to occur when the addition of project traffic causes:

- the average intersection delay for all-way stop-controlled intersections or the worst movement for side-street stop-controlled intersections to degrade to LOS F, and
- the peak hour traffic signal warrant from the California Manual of Uniform Traffic Control Devices (CA MUTCD) to be satisfied at an unsignalized intersection already operating at LOS F.

There are six unsignalized study intersections in four different jurisdictions including two cities, and two counties. The operations of the unsignalized intersections were evaluated using the method described in the *2000 HCM*. LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At side-street stop-controlled intersections, the average control delay is calculated for each stopped movement [and for left turns on the uncontrolled approach(es) of the intersection], not for the intersection as a whole. At all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. LOS definitions are shown in Table 5.15-10.

Additionally, the jurisdictions may apply the *California Manual on Uniform Traffic Control Devices* (CA MUTCD) peak-hour volume signal warrant (Warrant 3) to intersections operating at LOS F.[5] This warrant determines if the minor street traffic suffers undue delay when entering or crossing the major street for a minimum of one hour of an average day. This is based on the major street left- turn volume, the higher-volume minor-street approach volume, and calculated delay for vehicles on the higher-volume minor-street approach.

Freeway Segments

For the freeway impact analysis, the relevant jurisdiction's CMP LOS standards are used, as described below.

Santa Clara County

The LOS standard is LOS E for both mixed-flow and High Occupancy Vehicle (HOV) lanes (*Santa Clara County Annual Monitoring and Conformance Report 2014*, VTA, 2015). Under the Existing with Project Condition, a significant traffic impact would occur if freeway segment operations deteriorate from an acceptable level (LOS E or better) under Existing Conditions to an

[5] Signal warrant analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared to a sub-set of the standard traffic signal warrants recommended in the 2012 California *Manual on Uniform Traffic Control Devices* (CA *MUTCD*) guidelines. While satisfying one or more of these warrants could justify the installation of a signal at an intersection, this analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-measured rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals may lead to certain types of collisions.

unacceptable level (LOS F); or the project increases traffic of more than one percent of the capacity of the segments that operate at LOS F under Existing Conditions. Under Baseline (2018) and Cumulative (2035) Conditions, a traffic impact would occur if the addition of project traffic causes a freeway segment V/C ratio to increase from less than or equal to 1.00 to greater than 1.00; or the addition of project traffic increases traffic demand on the freeway segment already operating at a V/C ratio greater than 1.00 by an amount equal to one percent or more of the segment capacity.

San Mateo County

The LOS standards adopted by C/CAG for the freeway segments are presented below (*Final San Mateo County Congestion Management Program 2015*, C/CAG, November 2015).

- US 101
  - SR 92 to Whipple Avenue – LOS E
  - Whipple Avenue to Santa Clara County Line – LOS F
- I-280
  - SR 92 to SR 84 – LOS D
  - SR 84 to Santa Clara County Line – LOS F

A traffic impact would occur on a freeway segment in San Mateo County when one of the following happens:

- Freeway segment operations deteriorate from an acceptable level (a LOS equal to or better than the LOS threshold listed above) under No Project Conditions to an unacceptable level under with-project conditions; or
- On a freeway segment already operating at an unacceptable level under No Project Conditions, the addition of project traffic increases traffic demand on the freeway segment by an amount equal to one percent or more of the segment capacity, or causes the freeway segment V/C ratio to increase by one percent.

Freeway Ramps

With the addition of proposed Project traffic, there is the potential for increased queues on ramps. Queuing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions. Thus, this analysis summarizes the additional traffic and estimates the change in vehicle queue length compared to the existing available vehicle storage on each study ramp. Current ramp-metering rates provided by Caltrans were used to evaluate existing on-ramp queues and were set to match queues observed during field observations. Un-metered on-ramps are assessed based on the downstream freeway segment: if the segment is over-capacity, the on-ramp is assumed to have a queue exceeding capacity; if the segment is below-capacity, the on-ramp is determined to have a queue that is less than the ramp capacity. Off-ramp queues that terminate at an intersection were evaluated using ramp-terminal intersection queue estimates from the intersection LOS calculations, and off-ramps that with slip ramps onto local roadways were evaluated using a V/C ratio comparison.

Neighborhood Streets

Traffic impacts on residential streets within the City of Palo Alto are estimated using the Traffic Infusion on Residential Environment (TIRE) methodology. The TIRE index is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling, or playing. TIRE is expressed by index values that range from zero (representing the least noticeable effect on traffic) to five (representing the most severe effect). This method assumes any change in traffic that would cause an index increase of 0.1 or more would be noticeable to residents.

Transit Services

While the VTA TIA Guidelines contains no CEQA-specific threshold of significance for transit impacts, the California Governor's OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* states that a project that blocks access to a transit stop or blocks a transit route may interfere with transit functions. By contrast, when evaluating multimodal transportation networks OPR advises:

> *[L]ead agencies generally should not treat the addition of new users as an adverse impact. Any travel-efficient infill development is likely to add riders to transit systems, potentially slowing transit vehicle mobility, but also potentially improving overall destination proximity. Meanwhile, such development improves regional vehicle flow generally by loading less travel onto the regional network than if that development were to occur elsewhere.*

OPR recognizes that increased demand throughout a region may cause a cumulative impact requiring new or additional transit infrastructure. However, OPR states such impacts may be best addressed through a fee program that fairly allocates the cost of improvements not just to projects that locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system.

The VTA TIA Guidelines requires analysis of transit network performance including transit access and facilities and transit vehicle delay (transit vehicle travel time/speed and service reliability). For the purposes of this study, transit network performance was analyzed during the AM and PM peak hours based on the average transit vehicle delay associated with congestion at signalized intersections along a specified corridor with and without the Project. The change in average transit vehicle delay was determined using the following process:

- Review the average delay, by movement, at each signalized intersection within a study corridor in the transit vehicle path of travel.
- Determine the transit vehicle average delay due to congestion at intersections by summing the movement delay for each signalized intersection along the study transit corridor.
- Compare without-project and with-project average transit vehicle delay associated with congestion at intersections (note that the transit vehicle dwell time at transit stops is not included in the analysis).

Per the VTA TIA Guidelines, if substantial increased transit vehicle delay is found, the Lead Agency [Santa Clara County] should work with VTA to identify feasible transit priority measures near the affected facility and include contributions to any applicable projects that improve transit speed and reliability in the TIA.

Please also see Section 5.15.7, below, for information regarding transit capacity.

Bicycle and Pedestrian Facilities

While the VTA TIA Guidelines contain no CEQA-specific threshold of significance for pedestrian and bicycle impacts, the VTA TIA Guidelines require analysis of bicycle and pedestrian facilities including the effects of site development and roadway improvements on bicycle/pedestrian infrastructure, circulation, quality of service (QOS), and conformance to existing plans and policies. The Guidelines state that the QOS analysis should include the following component:

- *Review how well transportation infrastructure and streetscape features support bicycling and walking. Any project proposing changes to intersection/roadway geometry or signal operations shall include a QOS analysis for bicyclists and pedestrians at the location of the proposed changes. A QOS analysis is also recommended along project frontages under Existing Conditions. Along with a QOS analysis, a descriptive analysis of the project's effect on pedestrian and bicycle conditions is required.*

StreetScore+, developed by Fehr & Peers, was chosen to evaluate QOS at signalized intersections that may be changed due to identified mitigation measures. StreetScore+ calculates pedestrian and bicyclist comfort based indices based on best design practices for active transportation users. This tool was used because it produces meaningful results without extensive data collection or inputs. Some of the considerations in the pedestrian QOS calculation include sidewalk width, presence of a buffer between the sidewalk and adjacent vehicle travel lanes, adjacent traffic speeds, lighting, and crosswalk frequency. Some of the considerations in the bicycle QOS calculation include the type of bicycle facility provided and adjacent traffic volumes and speeds.

The Bicyclist StreetScore+ scoring is on a 1-4 scale, defined as follows:

- **StreetScore+ 1 (SS 1)** – The lowest level of traffic stress and the design goal for a network that accommodates people of all ages and abilities. This level of traffic stress allows children trained in traffic safety to bicycle to school by themselves, as well as people interested in, but concerned about, bicycling.
- **StreetScore+ 2 (SS 2)** – The highest level of acceptable traffic stress for the "interested but concerned" segment of the population. This is the threshold for a "low traffic stress" bicycle network that accommodates people of all ages and abilities.
- **StreetScore+ 3 (SS 3)** – This level of traffic stress accommodates a much smaller segment of population (an "enthused and confident" segment of the population) who are excited and more familiar with biking and will therefore accept a higher level of traffic stress.

- **StreetScore+ 4 (SS 4)** – This is a very high level of traffic stress that does not work for approximately 99% of the population. Only people in the "strong and fearless" group will feel comfortable riding on these facilities.

The Pedestrian StreetScore+ has a parallel structure to the Level of Traffic Stress approach for bicyclists, using a 1-4 scale, defined as follows:

- **StreetScore+ 1 (SS 1)** – Highly comfortable, pedestrian-friendly, and easily navigable for pedestrians of all ages and abilities, including seniors or school-aged children walking unaccompanied to school. These streets provide an ideal "pedestrian-friendly" environment.
- **StreetScore+ 2 (SS 2)** – Generally comfortable for many pedestrians, but parents may not feel comfortable with children walking alone. Seniors may have concerns about the walking environment and take more caution. These streets may be part of a "pedestrian-friendly" environment where it intersects with a more auto-oriented roadway or other environmental constraints.
- **StreetScore+ 3 (SS 3)** – Walking is uncomfortable, but possible. Minimum sidewalk and crossing facilities may be present, but barriers are present that make the walking experience uninviting and uncomfortable.
- **StreetScore+ 4 (SS 4)** – Walking is a barrier and is very uncomfortable or even impossible. Streets have limited or no accommodation for pedestrians and are inhospitable and possibly unsafe environment for pedestrians.

Approach to Analysis

Traffic Forecasting Process

The traffic forecasting process included use of the Santa Clara VTA Countywide Travel Demand Model (VTA Model) as well as a direct (or "manual") trip generation and distribution for Stanford trip growth. As stated at the start of this section, the following future scenarios were assessed:

- **2018 Baseline Conditions:** Year 2018 with the completion of development authorized under the 2000 General Use Permit (with the exception of EV Graduate Residences, which will not be occupied by 2018) and other local approved projects that would be built and fully occupied by Fall 2018;
- **2018 Baseline with Project Conditions:** 2018 Baseline Conditions with full buildout of the proposed 2018 General Use Permit;
- **2035 Cumulative Conditions:** Year 2035 with the completion of the development authorized under the 2000 General Use Permit (including EV Graduate Residences), background growth and reasonably foreseeable projects;
- **2035 Cumulative with Project Conditions:** 2035 Cumulative Conditions with full buildout of the proposed 2018 General Use Permit.

2018 Baseline and 2035 Cumulative Forecasts

The information presented below summarizes the forecasting process that is discussed in detail in the TIA in Appendix TIA-REV. Note that, while the near-term and cumulative years are defined as 2018 and 2035, respectively, the VTA 2020 and 2040 models were used as approximations of those years, with adjustments to more accurately reflect the local study area network and land uses.

Travel Demand Model Validation/Calibration – Existing Conditions

The existing conditions (network geometry [roadways and number of travel lanes] and land uses) reflected in the base year (2013) VTA Model were reviewed and updated to represent 2016 conditions within the jurisdictions of Palo Alto, East Palo Alto and Menlo Park. Stanford land use was then refined at the Traffic Analysis Zone (TAZ) level to more-accurately represent current Stanford vehicular traffic, captured by cordon counts in 2015. A post-processing step was applied to the model-estimated trip generation for Stanford TAZs, using a "Fratar" factoring process, which takes into account the inbound and outbound vehicle trip generation as an input, and then factors the origins and destinations of trips generated by the model for each of the Stanford TAZs. This process allows for the relative distribution of trips generated by the model for Stanford TAZs to be maintained, and also allows the model to assign Stanford vehicular traffic to the model roadway network using standard model impedance functions that take into account delay from Stanford trips as well as non-Stanford trips.

With these changes, the 2016 model's estimates of existing traffic volumes at study area intersections was compared to the Fall 2016 traffic counts, to validate the model's accuracy and make necessary calibration adjustments to the input files to ensure that the model operates in accordance with industry standards. At the conclusion of this process, the 2016 model was considered validated and appropriate for use in preparing traffic forecasts for the study area.

2018 Baseline Model

In order to represent conditions on the date of the County's consideration of the proposed Project (2018 Baseline Conditions), the VTA 2020 Model was used. The model land uses were developed with a straight-line interpolation between the 2016 and 2040 land use data sets because, while the 2020 model contains an official representation of transportation area-wide and regional transportation network improvements for that year, VTA does not maintain a 2020 land use data set. The 2040 land use data set was used for the interpolation because VTA does not maintain a 2035 land use data set. As part of this review, the land uses in specific TAZs were compared to approved and pending project lists submitted by the cities of Menlo Park and East Palo Alto, and checked against development projects described on the City of Palo Alto's website. This was completed to ensure the TAZs contained at least as much new development as indicated by the cities (approved projects and pending projects with a completed traffic study were included).

The 2018 Baseline Stanford trip growth was modeled in a two-step process to estimate the extent of the 2000 General Use Permit that would be completed in 2018. First, the 2020 model land uses were adjusted to allow the model to approximate the trip generation expected with completion of development authorized under the 2000 General Use Permit (with the exception of the EV Graduate Residences, which are not be expected to be completed and occupied until 2020). Then,

a post-processing step was applied to the model-estimated trip generation for Stanford TAZs using the same "Fratar" factoring process described above.

After the VTA modeling step, all Stanford trips were removed from the model to determine the regional and local growth in the area aside from the Stanford trips. This regional and local growth was then added to the existing 2016 turning movement counts. The trips associated with the 2018 Baseline Stanford trip growth (i.e., 2000 General Use Permit completion excluding EV Graduate Residences) were added to these turning movement volumes by manual trip assignment via the TRAFFIX 8.0 software. The trips were assigned to regional "gateways" using the trip distribution information described in the TIA (see Appendix TIA-REV). The 2018 Baseline results were reviewed for reasonableness and adjustments were made to the model input files to ensure traffic growth at the various intersections and freeway segments in the study area reasonably reflect the land use growth in the model.

It is noted that the 2018 Baseline roadway network includes the following planned improvements:

- US 101 both directions: one additional HOV 2+ lane (for two total) in each direction from University Avenue to SR 85
- US 101 both directions: one additional auxiliary lane from Marsh Road to SR 85

2035 Cumulative (Without Project) Model

The VTA 2040 model was used to represent 2035 Cumulative Conditions, as 2035 is the planned horizon year for the proposed 2018 General Use Permit. The model incorporates the official regional projections by ABAG, MTC, and VTA of development growth under the *Plan Bay Area* Regional Transportation Plan and Sustainable Community Strategy. Because it includes five additional years of growth beyond 2035, this is considered a conservative evaluation of cumulative buildout conditions. The list of approved and pending projects with a completed traffic study provided by the cities of East Palo Alto and Menlo Park, and the projects listed on the City of Palo Alto's website were verified to be included within the model. After these adjustments, the model's citywide land use growth in these cities was also reviewed against ABAG *Projections 2013* forecasts, and the model land uses were found to be somewhat higher, and therefore more conservative, than ABAG projections for the three cities as a whole. The 2040 model network was also reviewed to ensure that the network improvements reflect roadway and transit projects expected to be complete by 2035.

The Stanford trip growth that would occur in the 2035 Cumulative case is based upon buildout of the 2000 General Use Permit, including the EV Graduate Residences project. The Cumulative (2035) Baseline Stanford trip growth was modeled in a two-step process. First, the land uses were adjusted to allow the model to approximate the trip generation expected with completion of the 2000 General Use Permit. Then, a post-processing step was applied to the model-estimated trip generation for Stanford TAZs, using the same "Fratar" factoring as described above.

Regional and local growth from the model was added to existing 2016 turning movement counts following the same procedure identified above for the VTA 2020 Model. For the freeway forecasts, raw model volumes were used because a consistent set of traffic counts was not

available within the freeway study area. Stanford No Project trips were added manually via the TRAFFIX 8.0 software.

The 2035 Cumulative results were reviewed for reasonableness, and adjustments were made to the model input files to ensure traffic growth at the various intersections and freeway segments in the study area reasonably reflect the land use growth in the model. In addition, subsequent to circulation of the Draft EIR, the VTA's 2040 traffic model was revised to maintain the existing 4-lane configuration for Page Mill Road because the VTA indicated the 6-lane configuration had been an error on the part of VTA.

It is noted that the 2035 Cumulative model roadway network includes the following planned improvements, relative to the network in the 2018 Baseline model:

- US 101 both directions: 1 additional HOV 3+ lane (2 total) in each direction from Whipple Road to I-680
- US 101 both directions: 1 additional auxiliary lane from Marsh Road to SR 85
- I-280 both directions: 1 additional lane (4 total) in each direction between El Monte Road and Magdalena Avenue
- I-280 both directions: convert HOV 2+ lane to HOV 3+ lane between Magdalena Avenue and I-680
- SR 85 both directions: 1 additional HOV 3+ lane (2 total) between I-280 and SR 87
- SR 85 both directions: convert HOV 2+ lane to HOV 3+ lane between I-280 and SR 87
- Signalization of Intersections 13 and 14

Stanford Vehicle Trip Generation

This description focuses on vehicle (specifically, automobile) trip generation to and from off-campus destinations. Many off-campus trips are made by campus residents and commuters by other travel modes, including walking, bicycling, and transit. Furthermore, many internal campus trips are made by bicycling, walking, and the Marguerite shuttle; some internal campus trips are also made by automobile.

Existing Campus Vehicle Trip Generation Rates

The following inputs were used to estimate current Stanford vehicle trip generation rates and to project future traffic growth:

- 2015 peak-hour campus cordon vehicle counts conducted for the 2000 General Use Permit annual monitoring program;
- 2015 and 2016 vehicle trip counts of representative graduate student housing sites (EV) and faculty housing sites Peter Coutts Circle and Mears Court;
- 2015 student beds and housing units;
- 2015 academic and academic support square footage for the entire campus;

- Projections for changes in housing and academic and academic support square footage for the period from December 2015 through Fall 2018 under the 2000 General Use Permit, and from Fall 2018 through Fall 2035 under the proposed 2018 General Use Permit.

The method for estimating existing (2015) peak-hour vehicle trip generation rates for the campus (see **Table 5.15-11**) used total academic and academic support square footage as the overall vehicle trip generation variable, with an additional step that separates resident vehicle trip generation out so that resident and non-resident vehicle trip generation can be distributed to the roadway network using unique trip distribution patterns for each type of trips.

TABLE 5.15-11
CAMPUS VEHICLE TRIP GENERATION RATES – 2015

Component (variable)	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
All Campus Trips (per 1,000 sf of academic and academic support space)	0.330	0.188	0.264	0.342
Student Residents (per bed)	0.028	0.037	0.077	0.066
Faculty/Staff Residents (per residential unit)	0.15	0.28	0.26	0.19

SOURCE: Fehr & Peers, September 2018

Vehicle Trip Generation: Remaining Development under 2000 General Use Permit

The Stanford Community Plan establishes a standard for the Stanford campus of "No Net New Commute Trips" (specifically applied to vehicle trips in the peak hour and peak direction) compared to measured baseline conditions. To date, Stanford has achieved this standard each year through a combination of onsite trip reduction programs and offsite programs that have removed trips from the roads nearest to the campus.

Stanford has committed to continue to implement programs to achieve the No Net New Commute Trips standard during the remainder of the 2000 General Use Permit, and to expand those programs throughout the life of the proposed 2018 General Use Permit. However, to provide a conservative analysis similar to the analysis performed for the 2000 General Use Permit, this analysis assumes Stanford does not increase its trip reduction efforts beyond the existing programs, and growth in trips would occur with both the remaining development authorized under the 2000 General Use Permit and with buildout of the proposed 2018 General Use Permit.

The vehicle trip generation associated with remaining development authorized under the 2000 General Use Permit was calculated separately for 2018 Baseline Conditions and 2035 Cumulative Conditions because the EV Graduate Residences project would not be completed and occupied by 2018, but would be completed and occupied in 2035. The following discussion describes the process for estimating the No Project trips for both time horizons.

The number of residential and non-residential vehicle trips for the period between December 2015 and fall 2018/fall 2035 were estimated via the following four-step process:

Step A: Total new vehicle trip generation = (Growth in academic and academic support square footage) x (2015 campus trip generation rates)

Step B: Faculty/staff resident vehicle trip generation = (New residential units) x (2015 faculty/staff residential trip generation rates)

Step C: Student resident vehicle trip generation = (New student beds) x (2015 student residential trip generation rates)

Step D: Non-resident vehicle trip generation = Total campus trip generation – resident trip generation

Table 5.15-12 presents the remaining development authorized under the 2000 General Use Permit and assumed to be constructed by fall 2018 (when the 2018 General Use Permit is anticipated to commence). This analysis assumes that the net new academic and academic support square footage generates trips at the existing trip generation rate.

TABLE 5.15-12
DECEMBER 2015 – FALL 2018 DEVELOPMENT SUMMARY
(REMAINING DEVELOPMENT UNDER 2000 GENERAL USE PERMIT CONSTRUCTED BY FALL 2018)

Component	Beds / Units[a]	Academic Space (1,000 sf)[a]
Academic and Academic Support Space	---	769.354
Student (Beds)	416	---
Faculty / Staff (Dwelling Units)	0	---

[a] This land use will be completed by fall 2018 and is therefore included in the 2018 Baseline and 2018 Baseline with Project Conditions.

SOURCE: Stanford, September 2018.

Table 5.15-13 presents the remaining development authorized under the 2000 General Use Permit, including the EV Graduate Residences project. This is the development level that is assumed to be in place under the 2035 Cumulative Conditions.

TABLE 5.15-13
DECEMBER 2015 – FALL 2035 DEVELOPMENT SUMMARY
(REMAINING DEVELOPMENT UNDER 2000 GENERAL USE PERMIT CONSTRUCTED BY FALL 2035)

Component	Beds / Units[a]	Academic Space (1,000 sf)[a]
Academic and Academic Support Space	---	769.354
Student (Beds)	2,436	---
Faculty / Staff (Dwelling Units)	0	---

[a] This land use will be completed by Fall 2035 and is therefore included in the 2035 Cumulative Baseline and 2035 Cumulative with Project Conditions.

SOURCE: Stanford, September 2018.

Tables 5.15-14 and **5.15-15** present the total trip generation for 2018 and 2035 conditions using the trip generation rates presented in Table 5.15-11.

TABLE 5.15-14
DECEMBER 2015 – FALL 2018 VEHICLE TRIP GENERATION ESTIMATE
(REMAINING DEVELOPMENT UNDER 2000 GENERAL USE PERMIT CONSTRUCTED BY FALL 2018)

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Total Campus Trips (based on academic space growth)	**254**	**145**	**399**	**203**	**263**	**466**
Student Residents	11	15	26	32	27	59
Faculty / Staff Residents	0	0	0	0	0	0
Non-Residential Generators (Commuters, visitors, others)	243	130	373	171	236	407

SOURCE: Fehr & Peers, September 2018.

TABLE 5.15-15
DECEMBER 2015 – FALL 2035 VEHICLE TRIP GENERATION ESTIMATE
(REMAINING DEVELOPMENT UNDER 2000 GENERAL USE PERMIT CONSTRUCTED BY FALL 2035)

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Total Campus Trips (based on academic space growth)	**254**	**145**	**399**	**203**	**263**	**466**
Student Residents	66	90	156	188	161	349
Faculty / Staff Residents	0	0	0	0	0	0
Non-Residential Generators (Commuters, visitors, others)	188	55	243	15	102	117

SOURCE: Fehr & Peers, September 2018.

Vehicle Trip Generation: 2018 General Use Permit

The number of residential and non-residential vehicle trips generated by the proposed 2018 General Use Permit (expected to be built out by 2035) were estimated using the same process described above for remaining development under the 2000 General Use Permit. The 2018 General Use Permit development proposal is shown in **Table 5.15-16**. The resulting AM and PM peak-hour vehicle trip generation using the 2015 trip rates is shown in **Table 5.15-17**.

TABLE 5.15-16
2018 GENERAL USE PERMIT DEVELOPMENT PROPOSAL

Component	**Beds / Units[a]**	**Academic Space (1,000 sf)**
Academic and Academic Support Space	---	2,275
Student (Beds)	2,600	---
Faculty / Staff (Dwelling Units)	550	---

SOURCE: Stanford, November 2016.

TABLE 5.15-17
2018 GENERAL USE PERMIT VEHICLE TRIP GENERATION ESTIMATE

Generator	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Total Campus Trips (based on academic space growth)	**751**	**428**	**1,179**	**600**	**779**	**1,379**
Student Residents	70	96	166	200	172	372
Faculty / Staff Residents	83	154	237	143	105	248
Non-Residential Generators (Commuters, visitors, others)	598	178	776	257	502	759

SOURCE: Fehr & Peers, September 2018.

As with the trip generation estimate for remaining development under the 2000 General Use Permit, the 2018 General Use Permit trip generation estimates are based on the conservative assumption that the net new academic and academic support square footage would generate trips at the existing 2015 trip generation rates (i.e., there would be no further expansion of existing programs to reduce external vehicle trips). This is a conservative assumption given that Stanford has committed to continue to achieve the No Net New Commute Trips standard and intends to add to and expand its existing TDM programs under the 2018 General Use Permit. With this conservative assumption, the proposed 2018 General Use Permit would be expected to generate a total of about 751 additional inbound vehicle trips in the AM peak hour and about 779 additional vehicle outbound trips in the PM peak hour (see Table 5.15-17).

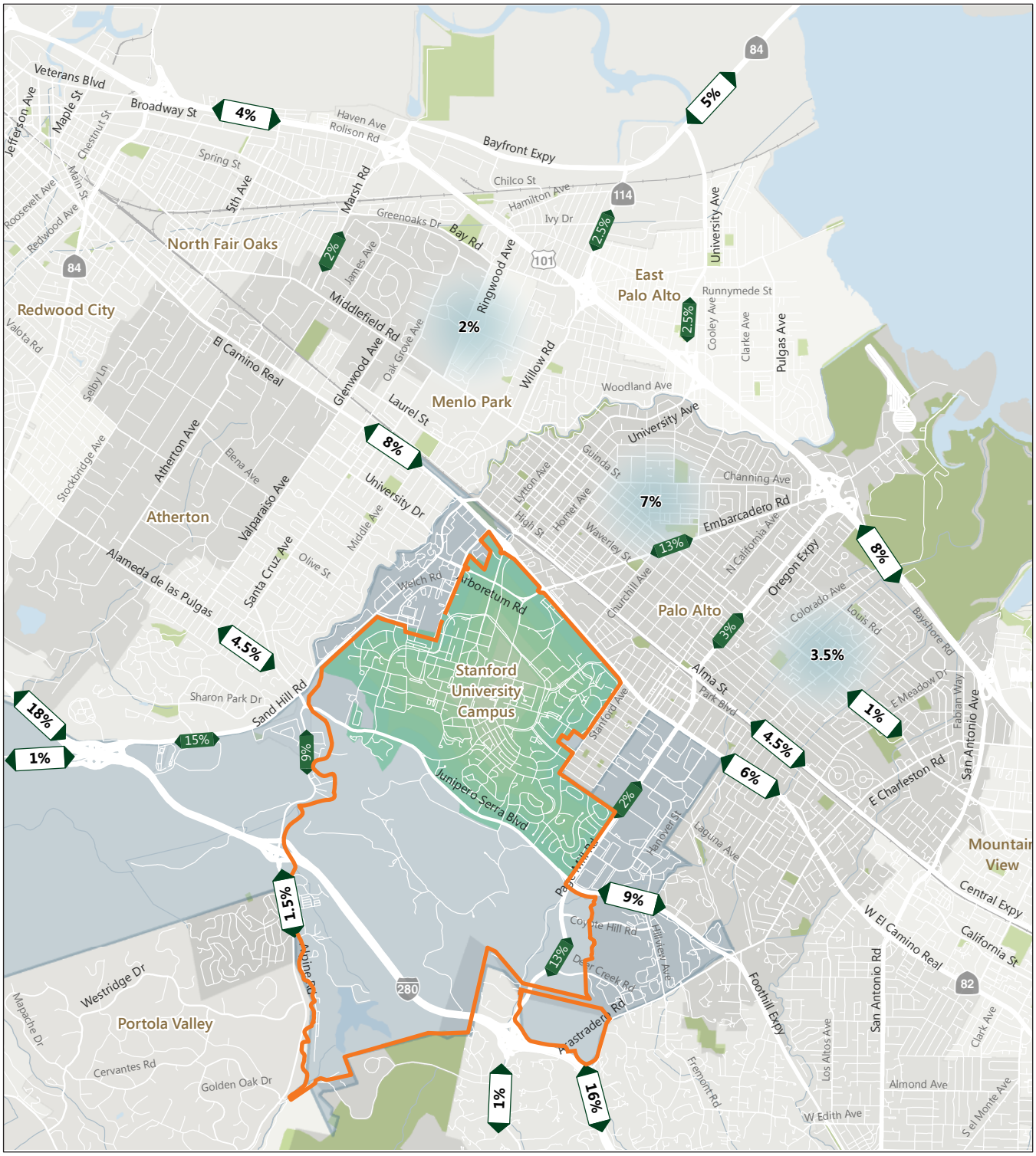
Stanford Vehicle Trip Distribution

Off-Campus Commuter Vehicle Trip Distribution

Stanford's 2015 commuter travel survey and information on commuter place of residence were used to develop a commuter vehicle trip distribution for the campus. The commuter mode choice (drive-alone or rideshare) by geography was combined with the total number of commuters within a geographic area to estimate the number of drivers from each area. The resulting vehicle trip distribution for Stanford off-campus commuters is shown in **Figure 5.15-6** (with boxes with the white background showing the primary directions of the trips, and boxes with the green background indicating the percent of the trips assigned to the local roadways). After review of potential changes in commuter residences by 2035, the vehicle trip distributions shown in Figure 5.15-6 were also used for the 2035 Cumulative analysis.

Campus Resident Vehicle Trip Distribution

The vehicle trip distribution for Stanford residents (faculty, staff and students) was developed using data from the Census Transportation Planning Package (CTPP) for three (primarily housing) census tracts surrounding Stanford. The data for these census tracts were combined to develop an off-campus vehicle distribution for all Stanford resident trips (see **Table 5.15-18**). The off-campus travel trip distribution was calculated by removing internal trips between the Stanford campus census tracts, which represented approximately 44 percent of the total trips. After making that off-campus adjustment, approximately 55 percent of the remaining resident vehicle trips



Stanford 2018 General Use Permit Boundary

NORTH

SOURCE: Fehr & Peers

Stanford 2018 General Use Permit . 160531

Figure 5.15-6
Distribution of Stanford Commuters
Using Auto Trip Place-of-Residence

TABLE 5.15-18
STANFORD RESIDENTS – OFF-CAMPUS DESTINATIONS

Location	Roadway	Percent	
Palo Alto	**Local**		**55.0%**
Palo Alto – Downtown	University, Embarcadero	10.0%	
Palo Alto – Medical Center / Shopping Center	Campus, El Camino Real (ECR), Junipero Serra	20.0%	
Palo Alto – South of Oregon / East of ECR	Oregon, ECR, Alma	5.0%	
Palo Alto – California Avenue / Research Park	ECR, Foothill	20.0%	
North of Campus	**Local**		**7.3%**
Menlo Park, Atherton	ECR North	3.9%	
Redwood City / San Carlos	ECR North, Santa Cruz	3.4%	
North of Campus	**Regional**		**6.5%**
Northern Peninsula – Belmont to Millbrae	I-280, Alpine, Sand Hill	1.8%	
San Francisco	I-280	4.1%	
South San Francisco / Daly City	I-280, Alpine, Sand Hill	0.6%	
South of Campus	**Local**		**7.2%**
Los Altos	Foothill	0.4%	
Mountain View	ECR South, Foothill, Alma Street/Central Expressway	6.8%	
South of Campus	**Regional**		**18.1%**
Santa Clara County	I-280, US 101	0.8%	
Santa Cruz County	I-280, US 101	1.0%	
Santa Clara, Sunnyvale, North San Jose	US 101, Alma Street, ECR South	6.2%	
Campbell / Central San Jose	I-280	0.2%	
Cupertino / Saratoga / Los Gatos	I-280, Foothill	1.1%	
Downtown – East San Jose	US 101, I-280	8.3%	
South San Jose	I-280	0.5%	
East of Campus	**Local**		**0.6%**
East Palo Alto	University, Embarcadero	0.6%	
East of Campus	**Regional**		**5.1%**
Alameda County	Dumbarton, US 101	3.3%	
Contra Costa County	Dumbarton, US 101	1.1%	
Fremont / Milpitas	Dumbarton, US 101	0.7%	
West of Campus	**Local**		**0.4%**
Portola Valley, Woodside	Alpine Road, Sand Hill	0.4%	
TOTAL		**100%**	**100%**

SOURCE: US Census Transportation Planning Products (CTPP) and Fehr & Peers, March 2017.

were assigned to destinations (four geographic areas) within the City of Palo Alto based on CTPP data regarding the trips to specific census tracts within the City of Palo Alto, as follows:

- Downtown and northern Palo Alto – north of Oregon Expressway and east of El Camino Real
- Southeast Palo Alto – south of Oregon Expressway and east of El Camino Real
- Southwest Palo Alto – south of the campus and west of El Camino Real (includes research park)
- Medical center and shopping center

The "Roadway" column in Table 5.15-18 identifies the primary roadways that would be used by Stanford residents. These roadways were selected based on engineering judgment and local knowledge of area congestion. **Figure 5.15-7** shows the vehicle trip distribution for Stanford residents. This distribution is used for both the 2018 and 2035 Cumulative analyses.

Impact Evaluation

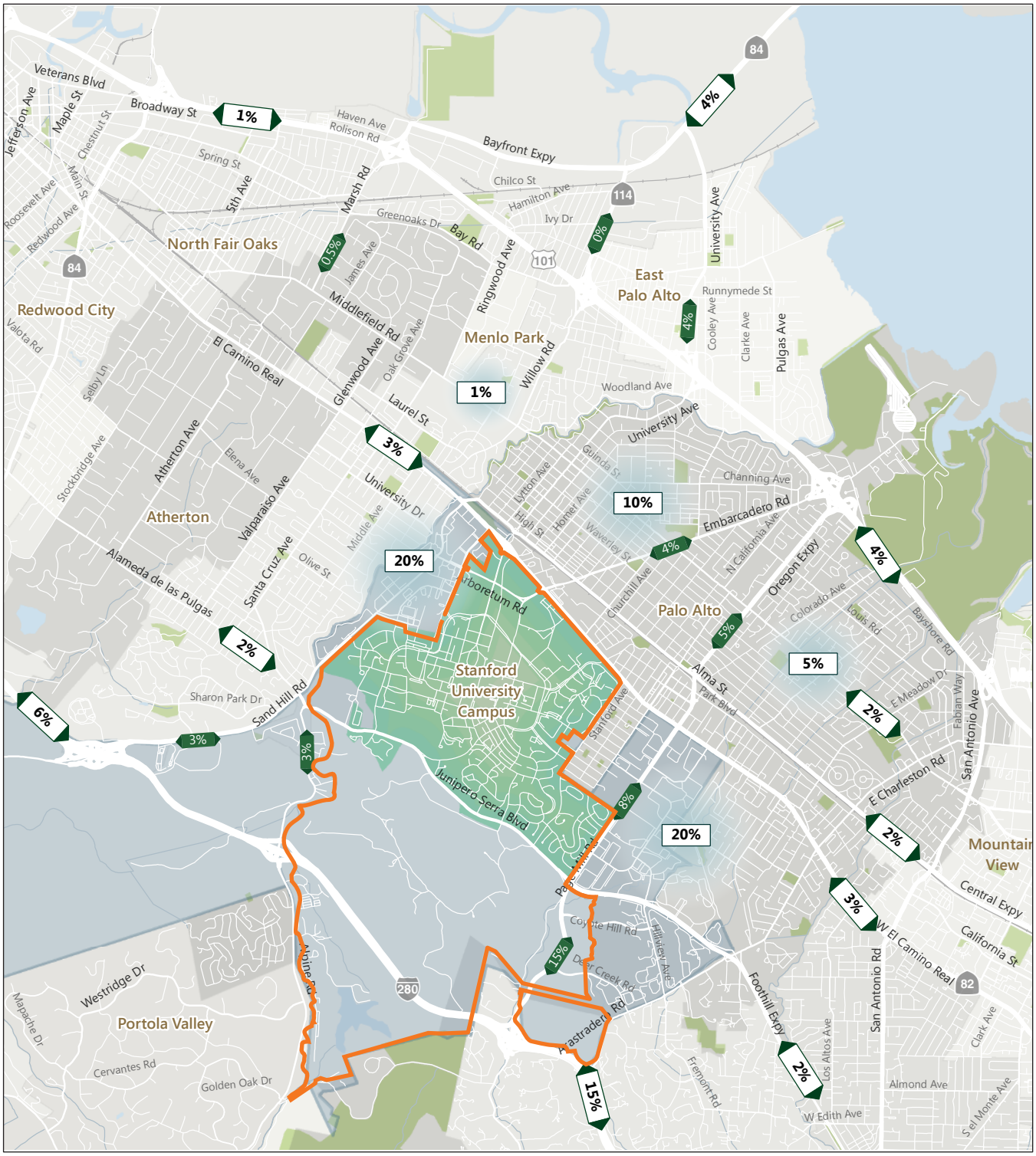
Construction Impacts

Impact 5.15-1: The proposed Project would generate construction traffic that would cause a substantial reduction in mobility and in access to land uses. (*Significant*)

In general, the type and intensity of construction activities under the proposed 2018 General Use Permit, and the associated level of construction traffic, would be similar to that which has occurred under the 2000 General Use Permit. Impacts could include reduction in off-campus on-street parking; reduction in pedestrian, bicycle and public transit access; additional peak-hour traffic; use of non-truck routes by construction traffic; and interference with special events. These impacts would be potentially significant.

Project impacts of construction traffic to mobility and access would be mitigated to less-than-significant levels through implementation of the following mitigation measures:

> **Mitigation Measure 5.15-1:** *Construction Traffic Control Measures.* The following traffic control measures are required to address impacts from construction of individual 2018 General Use Permit projects.
>
> - ***Protection and Maintenance of Public Transit Access and Routes***. Stanford and its contractors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, during project construction without prior approval from the VTA and other affected jurisdictions. Such approvals shall require submittal and advance coordination per VTA's Bus Stop Relocation Policy of a mitigation plan to reduce transit impacts to a less than significant level. Potential actions that would impact access to transit include, but are not limited to, relocating or removing public transit bus stops, limiting access to public transit bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.



SOURCE: Fehr & Peers

Stanford 2018 General Use Permit . 160531

Figure 5.15-7
Distribution of Stanford Residents Using Auto Off-Campus

- ***Maintenance of Pedestrian Access***. Stanford and its contractors shall be prohibited from substantially limiting pedestrian access to properties or facilities during construction of the project, without prior approval from the affected jurisdictions. Such approvals shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting pedestrian access include, but are not limited to, sidewalk closures, bridge closures, crosswalk closures, pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided if determined by the County to be needed for pedestrian safety.

- ***Maintenance of Bicycle Access***. Stanford and its contractors shall be prohibited from substantially limiting bicycle access to properties or facilities during construction of the project, without prior approval from those jurisdictions. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting bicycle access include, but are not limited to, bike lane closures or narrowing, closing or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists.

- ***Protection and Maintenance of Emergency Service Access and Routes***. Stanford shall inform the Stanford Police and Palo Alto Police and Fire Departments of construction locations, and shall designate alternate evacuation and emergency routes to maintain response times during construction periods.

- ***Parking for Construction-Related Vehicles***. Stanford shall provide adequate on-campus parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the Stanford campus, a satellite parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to/from the job site.

- ***Restriction on Construction Delivery Hours***. Stanford shall make feasible attempts to avoid construction material deliveries from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM on weekdays. When feasible, Stanford shall be required to prohibit or limit the number of construction employees arriving or departing the site between 4:30 PM and 6:00 PM.

- ***Construction Truck Routes***. Stanford shall deliver and remove all construction-related equipment and materials on truck routes designated by the Cities of Palo Alto and Menlo Park and, in the event the County of San Mateo designates truck routes, by the County of San Mateo. Heavy construction vehicles shall be prohibited from accessing the site from routes that the Cities of Palo Alto, Menlo Park, or County of San Mateo have prohibited for use by such vehicles. Stanford shall provide written notification to all contractors regarding appropriate routes to and from construction sites and the weight and speed limits for local roads used to access construction sites. A copy of all such written notifications shall be submitted to the County Planning Office.

- ***Phone Number for Complaints***. Stanford shall post at least one sign no smaller than 1,296 square inches at all active construction sites. The sign shall contain the name, telephone number and e-mail address of the appropriate Stanford person the public may contact to report alleged violations of this mitigation measure or to register complaints about construction traffic associated with building projects under the 2018 General Use Permit. Stanford shall keep a written record of all such complaints and shall provide copies of these records to the County Planning Office as part of the annual report process.

- ***Construction Impact Mitigation Plan***. In lieu of the above mitigation measures, Stanford may submit a detailed construction impact mitigation plan to the County for review and approval prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. If Stanford determines that it is not feasible to comply with the "Restriction on Construction Delivery Hours" above, then the plan shall also explain the basis for this infeasibility determination. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.

- ***Construction During Special Events***. Stanford shall prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be obtained to host such events during significant construction phases.

Significance after Mitigation: Less than Significant.

Operational Impacts

2018 Baseline With Project Conditions

Impact 5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions. (*Significant*)

Project impacts are identified by comparing the 2018 Baseline traffic volumes to the 2018 Baseline with Project Conditions traffic volumes. Significant impacts are identified based on the impact criteria presented in Table 5.15-9, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay[6] and critical V/C ratios for intersections operating unacceptably.[7] Levels of service for Baseline (2018) conditions, without and with the proposed Project, were calculated using the TRAFFIX 8.0 software, which uses the *2000 HCM*

6 Critical delay represents the delay associated with the critical movements of the intersection, or the movements that require the most "green time" and have the greatest effect on overall intersection operations.

7 As stated above, it is Stanford's intent to avoid the need for intersection capacity improvements, by achieving the Stanford Community Plan's No Net New Commute Trips standard. However, to ensure that potential impacts are not understated, this analysis conservatively assumes that Stanford does not achieve the Plan's standard.

methodology and is consistent with VTA TIA guidelines. The results of the LOS analysis are summarized in **Table 5.15-19**.

The intersections where the proposed Project would have a significant impact under 2018 Baseline with Project conditions, and the reason that the impact is considered significant, are documented in **Table 5.15-20**. Measures/strategies to mitigate the significant impacts are described below.

Mitigation Measure 5.15-2(a) addresses peak hour, peak direction project impacts, with fair share mitigation fees triggered if the "no net new commute trips" standard is not achieved, while Mitigation Measure 5.15-2(b) addresses peak-hour, off-peak (reverse commute) direction impacts, which are not subject to the "no net new commute trips" standard and, therefore, fair share mitigation fees are triggered upon project approval.[7a]

> **Mitigation Measure 5.15-2(a):** Stanford shall mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of fair share fees for the improvements for adversely affected intersections specified in Table 1 [minus the contribution to these improvements provided pursuant to Mitigation Measure 5.15-2(b), below], which funds shall be expended by the County to fund mitigation efforts.
>
> 1. As specified on page 64 and Policy C-1 of the Stanford Community Plan, the no net new commute trips standard is defined as no increase in automobile trips during peak commute times in the peak commute direction, as counted at defined cordon locations around the central campus. The peak commute period is defined as the one-hour period in the morning (AM) and afternoon (PM) with the highest volume of traffic at the cordon locations, as determined by traffic counts.
>
> 2. The reasonable cost of all traffic counts and other work conducted for determination of compliance with this mitigation measure shall be paid for by Stanford. The counts shall be performed by an independent consultant under the direction of the County Planning Office or provided to the County Planning Office through another County-approved methodology.
>
> 3. The baseline for measuring the no net new commute trips standard shall be the count that was established in 2001. However, during implementation of the 2018 General Use Permit, the County may modify, or approve Stanford-proposed modifications to the monitoring methodology on new technology such as automation, so long as the basic principles underlying the no net new commute trips standard are still met. If the monitoring methodology is updated, testing and calibration of the new methodology or equipment will require coordination with the County. The County may adjust the 2001 baseline as needed to reflect any such calibration. Monitoring counts shall be performed each year using the County-approved methodology.

[7a] Fehr and Peers, 2018 Stanford General Use Permit: Reverse-Commute Analysis, Appendix RCA.

TABLE 5.15-19
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
1	I-280 NB On-Ramp / Sand Hill Road	Menlo Park	LOS D	AM PM	10.4 12.5	B+ B	10.2 13.5	B+ B	0.015 0.032	-0.2 1.1
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**137.4** 21.4	**F** C+	**0.038** 0.021	**18.9** 0.2
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	32.4 21.0	C- C+	42.4 21.7	D C+	0.037 0.032	15.7 1.3
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	15.0 21.7	B C+	15.3 21.2	B C+	0.036 0.031	0.6 -0.5
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	16.7 16.6	B B	16.8 16.3	B B	0.036 0.032	0.4 -0.1
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	16.1 16.9	B B	16.0 16.8	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	48.9 48.1	D D	49.8 49.0	D D	0.031 0.038	1.4 1.7
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.6 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.0 0.1
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	23.3 28.2	C C	24.3 29.2	C C	0.028 0.027	1.6 1.2
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.9 27.3	C+ C	20.9 27.7	C+ C	0.009 0.017	0.3 0.7
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	18.5 27.3	B- C	19.3 27.8	B- C	0.013 0.017	1.3 0.9
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	39.0 34.1	D C-	38.9 34.3	D+ C-	0.012 0.016	-0.1 0.3
13	I-280 SB Ramps / Page Mill Road *	Santa Clara County	LOS E (Warrant)	AM PM	**151.7** **85.9**	**F** **F**	**153.3** **88.3**	**F** **F**	N/A	N/A

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
14	I-280 NB Ramps / Page Mill Road *	Santa Clara County	LOS E (Warrant)	AM PM	40.5 14.8	E B	41.5 14.9	E B	N/A	N/A
15	Deer Creek Road / Page Mill Road	Santa Clara County	LOS E	AM PM	14.5 13.5	B B	15.4 13.7	B B	0.026 0.021	1.4 -0.3
16	Coyote Hill Road / Page Mill Road	Santa Clara County	LOS E	AM PM	7.5 9.0	A A	8.0 9.4	A A	0.014 0.021	0.0 -0.2
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**101.5** **109.9**	**F** **F**	**0.029** **0.063**	**7.2** **19.3**
18	Peter Coutts Road / Page Mill Road	Santa Clara County	LOS E	AM PM	20.9 29.7	C+ C	21.3 29.8	C+ C	0.020 0.015	0.6 0.0
19	Hanover Street / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	63.0 47.6	E D	65.7 48.2	E D	0.013 0.017	0.6 -0.1
20	El Camino Real / Page Mill Road – Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	61.2 66.2	E E	66.1 68.8	E E	0.047 0.021	6.5 2.7
21	Middlefield Road / Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	63.6 58.5	E E+	64.2 58.9	E E+	0.009 0.012	1.0 0.5
22	Oregon Expressway / West Bayshore Rd	Santa Clara County	LOS E	AM PM	20.7 18.9	C+ B-	20.7 19.1	C+ B-	0.003 0.008	0.1 0.2
23	I-280 SB Ramps / Alpine Road *	San Mateo County	LOS E (Warrant)	AM PM	40.5 16.1	E C	41.0 16.2	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Road *	San Mateo County	LOS E (Warrant)	AM PM	27.2 26.8	D D	28.5 29.9	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Road	Menlo Park	LOS D	AM PM	43.8 48.8	D D	46.2 50.9	D D	0.049 0.048	3.0 2.4
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	28.7 40.7	C D	30.5 45.4	C D	0.009 0.052	1.2 5.9

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14.1 16.3	B B	14.5 17.9	B B	0.020 0.036	0.8 2.8
28	Junipero Serra Blvd / Stanford Avenue	Santa Clara County	LOS E	AM PM	19.6 21.1	B- C+	21.0 25.1	C+ C	0.061 0.076	1.8 4.4
29	Foothill Expressway / Hillview Avenue	Santa Clara County	LOS E	AM PM	35.0 34.9	C- C-	35.7 35.1	D+ D+	0.006 0.015	-0.3 0.2
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	74.7 **95.8**	E **F**	0.016 0.150	4.6 -1.0
31	Foothill Expressway / San Antonio Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	18.7 75.8	B- E-	19.2 78.5	B- E-	0.016 0.021	0.6 4.0
32	Foothill Expressway / El Monte Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	74.6 **88.9**	E **F**	79.0 **89.9**	E- **F**	0.014 0.004	9.5 1.3
33	Foothill Expressway / Springer Road – Magdalena Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	62.6 71.9	E E	64.0 73.2	E E	0.015 0.010	1.9 2.3
34	Bowdoin Street / Stanford Avenue *	Palo Alto	LOS E (Warrant)	AM PM	14.4 18.5	B C	18.4 27.6	C D	N/A	N/A
35	Arboretum Road / Quarry Road	Palo Alto	LOS D	AM PM	43.6 41.5	D D	44.1 42.1	D D	0.040 0.039	1.2 1.4
36	Arboretum Road / Palm Drive	Palo Alto	LOS D	AM PM	29.9 28.6	C C	31.9 29.4	C C	0.085 0.044	3.3 1.3
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	17.2 29.9	B C	17.0 29.8	B C	0.011 0.015	-0.1 0.1
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	42.5 42.0	D D	42.4 42.2	D D	0.017 0.015	0.4 0.5
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	31.3 35.6	C D+	31.0 35.4	C D+	0.018 0.017	-0.3 -0.1

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
40	El Camino Real / Santa Cruz Avenue	Menlo Park	LOS D	AM PM	14.0 23.0	B C	13.8 22.7	B C+	0.018 0.016	-0.3 -0.4
41	El Camino Real / Ravenswood Road	Menlo Park	LOS D	AM PM	43.7 47.0	D D	43.9 47.2	D D	0.022 0.020	0.6 0.7
42	El Camino Real / Roble Avenue	Menlo Park	LOS D	AM PM	14.4 14.7	B B	14.1 14.3	B B	0.014 0.013	-0.3 -0.3
43	El Camino Real / Middle Avenue	Menlo Park	LOS D	AM PM	27.2 27.5	C C	27.0 27.2	C C	0.014 0.009	-0.3 -0.2
44	El Camino Real / Cambridge Avenue	Menlo Park	LOS D	AM PM	13.6 19.6	B B-	13.4 19.5	B B-	0.014 0.009	-0.3 -0.2
45	El Camino Real / Quarry Road	Palo Alto	LOS D	AM PM	14.3 33.2	B C-	15.8 34.2	B C-	0.029 0.031	1.6 1.6
46	El Camino Real (SB) / University Avenue	Palo Alto (SC CMP)	LOS E	AM PM	21.1 20.3	C+ C+	20.7 20.0	C+ C+	0.028 0.030	-0.2 -0.3
47	El Camino Real (NB) / University Avenue	Palo Alto (SC CMP)	LOS E	AM PM	19.5 26.3	B- C	20.0 26.4	B- C	0.030 0.033	0.4 0.8
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)	LOS E	AM PM	45.9 51.1	D D-	47.5 54.9	D D-	0.047 0.059	2.0 7.0
49	El Camino Real / Churchill Avenue	Palo Alto	LOS D	AM PM	24.7 26.6	C C	24.4 26.4	C C	0.017 0.018	-0.1 -0.1
50	El Camino Real / Serra Street	Palo Alto	LOS D	AM PM	24.5 28.0	C C	27.8 33.2	C C-	0.082 0.112	5.4 8.0
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	33.0 31.9	C- C	33.8 33.1	C- C-	0.060 0.054	11.5 2.0
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	24.0 28.8	C C	22.8 27.9	C+ C	0.029 0.031	-0.9 -0.7

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
53	El Camino Real / Arastradero Road - Charleston Road	Palo Alto (SC CMP)	LOS E	AM PM	47.8 55.6	D E+	48.3 56.3	D E+	0.020 0.007	0.9 0.4
54	El Camino Real / San Antonio Road	Mountain View (SC CMP)	LOS E	AM PM	53.4 53.6	D- D-	53.4 53.5	D- D-	0.008 0.007	0.0 -0.1
55	Alma Street / Lytton Avenue	Palo Alto	LOS D	AM PM	20.8 18.0	C+ B	21.8 18.6	C+ B-	0.016 0.015	1.5 0.8
56	Alma Street / Hamilton Avenue	Palo Alto	LOS D	AM PM	6.9 14.9	A B	7.1 15.3	A B	0.008 0.012	0.2 0.8
57	Alma Street / Churchill Avenue	Palo Alto	LOS D	AM PM	28.2 48.3	C D	28.3 48.3	C D	0.005 0.005	0.1 0.0
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**55.7** **55.9**	**E+** **E+**	0.010 0.017	0.5 1.1
59	Middlefield Road / Marsh Road	Atherton	LOS D	AM PM	29.2 53.9	C D-	30.1 54.4	C D-	0.012 0.005	1.4 0.8
60	Middlefield Road / Ravenswood Avenue	Menlo Park	LOS D	AM PM	34.3 40.4	C- D	35.0 41.2	C- D	0.012 0.012	0.8 0.9
61	Middlefield Road / Ringwood Avenue	Menlo Park	LOS D	AM PM	38.0 50.6	D+ D	38.1 50.7	D+ D	0.004 0.005	0.2 0.2
62	Middlefield Road / Willow Road	Menlo Park	LOS D	AM PM	47.9 47.3	D D	48.0 47.5	D D	0.007 0.006	5.3 0.2
63	Middlefield Road / Lytton Avenue	Palo Alto	LOS D	AM PM	38.0 45.9	D+ D	38.3 46.5	D+ D	0.018 0.016	0.4 0.6
64	Middlefield Road / University Avenue	Palo Alto	LOS D	AM PM	30.0 35.6	C D+	30.3 36.1	C D+	0.019 0.031	0.3 0.9
65	Middlefield Road / Hamilton Avenue	Palo Alto	LOS D	AM PM	11.5 11.6	B+ B+	11.5 11.6	B+ B+	0.009 0.007	0.0 0.0

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
66	Middlefield Road / Embarcadero Road	Palo Alto	LOS D	AM PM	33.7 39.6	C- D	34.1 40.1	C- D	0.030 0.025	0.7 0.5
67	St. Francis Drive / Embarcadero Road	Palo Alto	LOS D	AM PM	23.6 17.5	C B	23.4 17.3	C B	0.015 0.014	0.0 -0.1
68	E. Bayshore Road / Embarcadero Road	Palo Alto	LOS D	AM PM	51.3 **57.6**	D- **E+**	51.6 **58.1**	D- **E+**	0.007 0.005	0.4 0.6
69	Middlefield Road / Charleston Road	Palo Alto	LOS D	AM PM	50.5 52.6	D D-	50.6 52.7	D D-	0.004 0.006	0.0 0.2
70	US 101 SB Ramps / Marsh Road	Menlo Park	LOS D	AM PM	32.6 33.9	C- C-	32.6 33.9	C- C-	0.000 0.000	0.0 0.0
71	US 101 NB Ramps / Marsh Road	Menlo Park	LOS D	AM PM	18.2 20.7	B- C+	18.2 20.7	B- C+	0.000 0.000	0.0 0.0
72	Bay Road / Willow Road	Menlo Park	LOS D	AM PM	18.8 10.7	B- B+	18.8 10.7	B- B+	0.008 0.006	0.1 0.0
73	Newbridge Street / Willow Road	Menlo Park	LOS D	AM PM	43.5 44.1	D D	43.4 44.1	D D	0.005 0.004	0.0 0.2
74	O'Brien Drive / Willow Road	Menlo Park	LOS D	AM PM	12.0 14.5	B+ B	11.9 14.5	B+ B	0.003 0.005	0.0 0.0
75	Hamilton Avenue / Willow Road	Menlo Park	LOS D	AM PM	40.9 45.3	D D	41.5 45.5	D D	0.005 0.003	1.0 0.3
76	Bayfront Expy / Willow Road	Menlo Park (SM CMP)	LOS F	AM PM	40.3 57.8	D E+	40.3 58.0	D E+	0.000 0.004	0.0 0.2
77	Woodland Avenue / University Avenue	East Palo Alto	LOS D	AM PM	54.5 **60.1**	D- **E**	54.8 **60.3**	D- **E**	0.000 0.000	0.0 0.0
78	US 101 SB Ramps / University Avenue	East Palo Alto	LOS D	AM PM	29.4 25.5	C C	29.4 25.5	C C	0.003 0.006	0.1 0.1

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
79	Donohoe Street / University Avenue	East Palo Alto	LOS D	AM PM	**72.4** 44.3	**E** D	**73.2** 44.3	**E** D	0.005 0.004	1.3 0.1
80	University Avenue / Bay Road	East Palo Alto	LOS D	AM PM	48.6 50.1	D D	48.7 50.6	D D	0.005 0.009	0.2 0.9
81	University Avenue / Bayfront Expressway	Menlo Park (SM CMP)	LOS F	AM PM	23.6 94.4	C F	23.7 96.9	C F	0.008 0.007	0.2 3.1
82	Town & Country Driveway / Embarcadero Road	Palo Alto	LOS D	AM PM	28.9 28.4	C C	28.1 28.0	C C	0.031 0.021	-0.6 -0.3
83	Charleston Road / San Antonio Road	Palo Alto (SC CMP)	LOS E	AM PM	61.6 62.5	E E	61.8 62.7	E E	0.001 0.002	0.3 0.4
84	US 101 SB Ramps / Willow Road	Menlo Park	LOS D	AM PM	11.4 13.0	B+ B	11.5 13.0	B+ B	0.002 0.000	0.2 0.0
85	US 101 NB Ramps / Willow Road	Menlo Park	LOS D	AM PM	21.1 23.5	C+ C	21.2 23.5	C+ C	0.000 0.002	0.0 0.1
86	Central Expressway / Rengstorff Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**175.3** **83.9**	**F** **F**	**177.4** **86.1**	**F** **F**	0.010 0.008	3.1 1.3
87	Central Expressway / Shoreline Blvd (N)	Santa Clara Co. (SC CMP)	LOS E	AM PM	3.6 7.0	A A	3.6 6.9	A A	0.003 0.007	0.0 -0.1
88	Central Expressway / Shoreline Blvd (S)	Santa Clara Co. (SC CMP)	LOS E	AM PM	12.0 7.6	B+ A	11.9 7.5	B+ A	0.003 0.005	-0.1 0.0
89	Central Expressway / Moffett Boulevard	Santa Clara Co. (SC CMP)	LOS E	AM PM	**122.6** **94.4**	**F** **F**	**125.1** **97.1**	**F** **F**	0.007 0.006	4.1 3.3
90	Foothill Expressway / Edith Avenue	Santa Clara County	LOS E	AM PM	28.9 39.0	C D+	29.2 43.2	C D	0.016 0.288	0.6 22.9
91	Foothill Expressway / Main Street	Santa Clara Co. (SC CMP)	LOS E	AM PM	23.0 24.3	C+ C	23.2 24.4	C C	0.016 0.009	0.5 -0.4

TABLE 5.15-19 (CONTINUED)
2018 INTERSECTION LEVELS OF SERVICE
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
92	University Avenue / O'Brien Drive	Menlo Park	LOS D	AM PM	9.2 12.7	A B	9.2 12.7	A B	0.005 0.006	0.0 0.0
93	University Avenue / Adams Drive *	Menlo Park	LOS E (warrant)	AM PM	**76.3** 30.7	**F**[h] D	**79.8** 31.9	**F**[h] D	N/A	N/A
94	University Avenue / Runnymede Street	East Palo Alto	LOS D	AM PM	15.3 19.9	B B-	15.3 19.8	B B-	0.005 0.005	0 0
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 18.2	B B-	14.7 18.1	B B-	0.005 0.005	0 -0.1

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.
In some cases, intersections may show a reduction in average delay with the addition of Project traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County; "(SM CMP)" indicates CMP intersection in San Mateo County
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] Change ("Δ") in critical volume-to-capacity ratio (V?C) between Background (2018) and Background (2018) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".
[g] Change ("Δ") in average critical movement delay between Background (2018) and Background (2018) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".
[h] A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, September 2018.

TABLE 5.15-20
2018 BASELINE WITH PROJECT INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#13 I-280 SB Off-Ramp / Page Mill Road (AM and PM Peak Hours)	**Unsignalized Intersection:** Under unacceptable LOS F conditions without and with the project, peak-hour traffic signal warrant would be met.
#17 Junipero Serra Blvd – Foothill Expy / Page Mill Rd (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Project-generated traffic would cause a degradation from an acceptable LOS D to an unacceptable LOS E.

4. Traffic counts and determination of traffic volumes shall occur as described below, unless modifications are approved by the County Planning Office.

    a. Peak-hour traffic for a single year shall be determined through counts taken at two times during the year. All counts shall be conducted during the regular academic year, which does not include academic breaks or end-of-quarter finals. Homecoming or other irregular traffic patterns should be avoided. Specific dates for each count shall be determined by the County Planning Office. The two annual counts shall be averaged to determine the annual traffic level for each monitoring year.

        i. During monitoring periods, the total amount of traffic crossing the cordon line will be counted by travel direction. The cordon count monitoring will be conducted on a 24-hour basis. The morning (AM) and afternoon (PM) peak hours within the 24-hour count period will be calculated based on total volumes to determine the campus-wide peak hours.

        ii. All counts shall be taken at the campus entry and exit points shown in Figure 5.15-2, which together form the defined cordon line. Additional cordon gateways may be added or the location of the cordon line may be modified as determined by the County.

            a) Traffic counts shall include a methodology to determine the rate of cut-through traffic.

                1) Cut-through trips will be identified through license plates on each vehicle or other means. Entry and exit times will be noted to determine when a vehicle crosses the cordon in either direction.

TABLE 1
STUDY INTERSECTION MITIGATION MEASURES UNDER 2018 GENERAL USE PERMIT

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Project Conditions	2035 Cumulative with Project Conditions
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	Contribute fair share funding toward the addition of second northbound right-turn lane, as identified in the ConnectMenlo Final Environmental Impact Report.	X	X
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X	
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward installation of an overlap signal phase for northbound and southbound right-turning vehicles and widening of the southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane. Contribute fair-share funding toward the installation of a third westbound through lane and associated receiving lane with a westbound right-turn overlap phase.	X	X
19	Hanover St / Page Mill Rd – Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a second westbound left-turn lane, identified as an option in the Page Mill Expressway Corridor Study Report.		X
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report.		X
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	No feasible mitigation measure.		X
29	Foothill Expy / Hillview Ave	Santa Clara County	No feasible mitigation measure.		X
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward a grade separation improvement project, as identified in the draft Santa Clara County Expressway Plan 2040. The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.	X	X
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue as identified in the draft Santa Clara County Expressway Plan 2040.		X

TABLE 1 (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER 2018 GENERAL USE PERMIT

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Project Conditions	2035 Cumulative with Project Conditions
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third northbound through lane and associated receiving lane that extends to San Antonio Avenue, as identified in the draft Santa Clara County Expressway Plan 2040.		X
33	Foothill Expy / Springer Road - Magdalena Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the following improvements, as identified as a Tier 2 improvement in the draft Santa Clara County Expressway Plan 2040: • Convert the signal to provide 8-phase phasing; • Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and • Change the configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.		X
37	El Camino Real / Encinal Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
38	El Camino Real / Valparaiso Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	Contribute fair share funding toward the addition of a second northbound left-turn lane.		X
56	Alma St / Hamilton Ave	Palo Alto	Contribute fair share funding toward the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, by removing a portion of the parking.		X
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements.	X	X
59	Middlefield Rd / Marsh Rd	Atherton	Contribute fair share funding toward the addition of a second westbound left-turn lane and second receiving lane on the south leg.		X
63	Middlefield Rd / Lytton Ave	Palo Alto	No feasible mitigation measure.		X
66	Middlefield Rd / Embarcadero Rd	Palo Alto	No feasible mitigation measure.		X

TABLE 1 (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER 2018 GENERAL USE PERMIT

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Project Conditions	2035 Cumulative with Project Conditions
89	Central Expy / Moffett Blvd	Santa Clara County (SC CMP)	The City of Mountain View's planned closure of Castro Street at the train tracks to form a T-intersection of Central Expressway and Moffett Boulevard would mitigate the Project impact (Mountain View Transit Center Master Plan). The effects of this project are shown in the mitigation columns to the right. If the Castro Street closure project is not implemented, the secondary, back-up mitigation is to contribute fair-share funding toward the construction of a second southbound left turn lane from Central Expressway to Moffett Boulevard. Stanford shall contribute its fair-share funding toward the second southbound left-turn lane from Central Expressway to Moffett Boulevard. The funding can be used for the Castro Street closure project.		X
90	Foothill Expressway / Edith Avenue	Santa Clara County (SC CMP)	No feasible mitigation measure.		X

2) Matching license plates will be determined by comparing numbers that crossed both an entering and exiting cordon within a defined period (i.e., 20 minutes or as updated), or through other means. Vehicles that enter and exit the cordon within the time period will be cut-through trips across the campus without a campus-related purpose. If data are available or it is feasible to measure, the County will include in the cordon counts all rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs.

b) Cordon volumes will be adjusted to account for use of parking lots within the cordon line by hospital-related traffic and use of lots outside the cordon line by campus-related traffic. Parking areas change due to the evolving needs of campus and hospital operations. The lots used for hospital and university parking shall be confirmed prior to annual surveys. The County reserves the right to change the methodology related to hospital parking or other parking factors in response to changing conditions.

1) Hospital trips will be subtracted from the count and campus trips will be added to the count. The count adjustment will also factor in the potential for hospital trips to park in the campus lots and campus trips to park in the hospital lots. At the beginning and end of the peak hours, data will need to be collected from each lot. If campus parking occurs in lots outside the cordon, trips associated with those vehicles will be added back into the count. If hospital parking occurs inside the cordon, trips associated with those vehicles will be subtracted from the count. All vehicles without a parking permit will be assumed to be correctly parked in their respective lots, unless the County approves an alternate protocol for assigning such parking.

c) Based on the 24-hour counts, the AM and PM peak hours will be identified for the campus. Peak hour traffic volume will be determined for the campus based on the count, adjusted for cut-through traffic and hospital parking as described above.

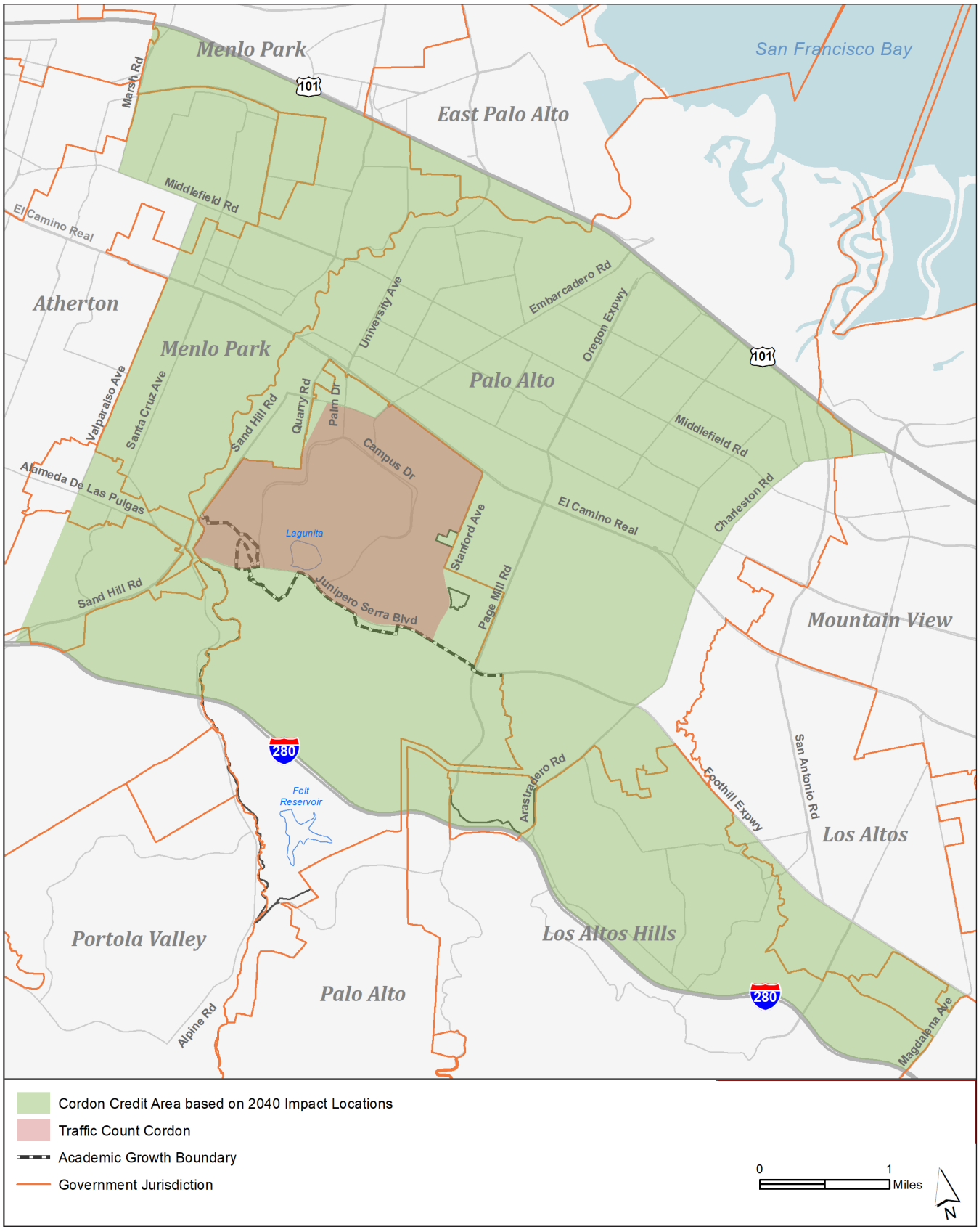
1) Total entering and exiting traffic will be summed for the 16 campus gateways. A single AM and PM peak hour will be determined for the entire campus based on the peak inbound traffic in the AM period and the peak outbound traffic in the PM period. The percent of cut-through trips calculated by the license plate matching (or other technology) described above will be removed. With the exception of rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs, the cut-through vehicles will be removed from both the inbound and the outbound traffic since they will have been observed crossing both an entering and exiting cordon boundary. Finally, the entering and

exiting traffic for hospital uses inside the cordon boundary and the campus uses outside the cordon boundary calculated as described above will be subtracted from or added to the counts.

5. As specified by Community Plan Policy C-8, the County Planning Office will recognize participation by Stanford in off-campus trip reduction efforts and credit those reduced trips towards Stanford's attainment of the no net new commute trips standard. Stanford shall receive credit commensurate with the actual number of trips reduced outside the cordon due to Stanford's direct efforts, or the proportion of the cost of the program to which Stanford is contributing. A reduction of an off-campus trip may be recognized as long as at least one terminus for the trip is within the area shown on **Figure 5.15-8**. The County Planning Office will determine the appropriate trip credit and monitoring methodology for each program in which Stanford proposes to participate. Such proposals shall be submitted by Stanford to the County Planning Office for review, modification and potential approval. The proposals shall be presented to the Community Resource Group prior to any determination by the County Planning Office. Once the County Planning Office has accepted the proposal and the program implementation begins, the County Planning Office will identify, at Stanford's cost, the number of trips reduced outside the cordon and calculate a trip reduction credit for application toward attainment of the no net new commute trips standard, with the continuing requirement that Stanford provide evidence of its participation in the ongoing program in a manner that can be independently verified. The County reserves the right to further regulate Project-generated trips and the use of trip credits through the Conditions of Approval for the General Use Permit.

   Funding of off-campus circulation infrastructure improvements may also qualify for trip credits if the improvements will enhance safety or increase mobility for pedestrians, bicyclists or transit users within the local impact area, and thereby remove vehicular trips from the local impact area. For example, funding roadway widening or modifications to add transit vehicle or bicycle lanes or to add signals to improve pedestrian or bicycle safety could qualify for trip credits under this approach if approved by the County. Any proposal for such credits shall be accompanied by substantial evidence demonstrating that the infrastructure project would remove vehicular trips from the local impact area. Once the County Planning Office has approved infrastructure improvement project for a trip reduction credit, the project has been implemented, and the trip reductions have been verified, the trip reduction credit will be factored into the County's conclusion regarding Stanford's annual compliance with the no net new commute trips standard in each subsequent year.

   Each year, the County will report Stanford's trip credits in its annual monitoring report. The County will track and calculate trip reduction credits in a manner designed to ensure that credits benefit the three geographic sub-areas surrounding the Stanford campus (north, east, and south/southwest) in rough proportion to the 2018 General Use Permit trip assignment forecasted in the Draft EIR. Trip reduction credits with area-wide benefit will be tracked separately from trip reduction credits with sub-area geographic benefits.



SOURCE: Stanford LBRE LUEP

Stanford 2018 General Use Permit . 160531

Figure 5.15-8
Revised Cordon Credit Area

6. The County Planning Office shall monitor the cordon counts using the procedures described above. If the cordon counts, as modified by trip reduction credits, exceed the baseline volume by 1% or more for any two out of three consecutive years, mitigation of impacts to intersections in the form of fair share payments will be required, implementing Stanford Community Plan Implementation Recommendation C(i)(9). Table 1 identifies the intersection impacts that could occur if the no net new commute trips standard is not achieved, and the physical improvements that would substantially reduce each impact.

   Upon the County's determination that the no net new commute trips standard has been exceeded by 1% or more in two out of three consecutive years, the County will require Stanford to make its fair share contribution toward improvements at adversely affected intersections and roadways based on all exceedances of the "no net new commute trips" standards.

   The County Planning Office will use the intersection improvement fees collected from Stanford as follows:

   a. The fees shall be used to fund the intersection improvements identified in Table 1. The priority order for funding such intersection improvements will be determined by the County Planning Office in consultation with the affected jurisdictions. If the fees are used to fund an intersection improvement in another jurisdiction, the County will enter into an agreement with such jurisdiction to address the timing for the County to provide the funding, the timing for the relevant jurisdiction to complete the improvement, and any other matters that the County determines to be appropriate.

   b. Substitute Mitigation: If the County Planning Office determines that it is not feasible to use the fees for the specified intersection improvements (e.g., it does not appear that there will be full funding for the improvements within a reasonable time; the public agencies with authority or jurisdiction over the improvement projects will not approve the projects), then the fees may be used to fund off-campus projects that encourage and improve the use of alternative transportation modes or otherwise reduce peak period traffic in the local impact area, including but not limited to transit improvements that would directly or indirectly benefit the local impact area. This fund also could be used for transportation improvements that increase safety and mobility for pedestrians, bicyclists and transit users provided there is substantial evidence demonstrating how the improvements would remove vehicular trips from the local impact area.

Mitigation Measure 5.15-2(b): Stanford shall mitigate the transportation impacts of its additional development and population growth with respect to reverse-commute impacts through the contribution of fair share fees for the cost of improvements for adversely affected intersections specified in Table 2 (a subset of the adversely affected intersections specified in Table 1), which funds shall be expended by the County to fund transportation mitigation efforts in the same manner as provided in Mitigation Measure 5.15-2(a)(6)(a) and (b).

Significance after Mitigation: Significant and Unavoidable.

TABLE 2
STUDY INTERSECTION REVERSE-COMMUTE MITIGATION MEASURES UNDER 2018 GENERAL USE PERMIT

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Project Conditions	2035 Cumulative with Project Conditions	Fair-Share Contribution[a]
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X		12.9%
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward installation of an overlap signal phase for northbound and southbound right-turning vehicles and widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane.	X	X	12.6%
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report.		X	7.3%
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X	4.3%
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane.	X		1.5%

NOTE:

[a] The fair-share contribution is estimated based on the total number of proposed Project reverse-commute direction trips at the intersection divided by the difference between the total cumulative intersection volume and the existing intersection volume. The value presented in this table represents the maximum percentage of the AM and PM peak hours if both peak hours are impacted; the AM percentage if only the AM peak hour is impacted, and the PM percentage if only the PM peak hour is impacted. Additional calculations are provided in Appendix RCA. It should be noted that these percentages are projected based on Baseline and Cumulative projects known at this time, and are subject to change if new projects (i.e., projects not included in Baseline and/or Cumulative analysis scenarios) that would add volumes to the study intersections are approved prior to issuance of the first building permit authorized under the 2018 General Use Permit.

This mitigation would substantially reduce traffic congestion impacts to intersections; however, this is considered a significant and unavoidable impact because it is uncertain whether it would be feasible to improve some of the affected intersections if the No Net New Commute Trips standard is not achieved, if there are not sufficient additional funds to complete the intersection impacts, or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2018 Baseline with Project conditions identified in Table 1, above, are located in other jurisdictions, and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. For these reasons, the impact would remain significant and unavoidable.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the proposed Project, the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are evaluated below. In all cases, these effects of mitigation are determined to be less than significant.

- **Intersection #2: Contribute fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report.***

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #13: Contribute fair-share funding to the installation of a traffic signal at the unsignalized intersection of I-280 Southbound Off-Ramp / Page Mill Road.**

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans,

and requires additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the bicycle StreetScore+ QOS, as it would remain unchanged at QOS 3.7. There is no pedestrian access at this intersection.

It is noted that Santa Clara County's *Page Mill Expressway Corridor Study Report* describes improvements along the length of Page Mill Road from the I-280 Southbound Ramps to El Camino Real. The improvement concept at the I-280 Southbound Ramps intersection is a roundabout with a traffic signal at the I-280 Northbound Ramps intersection and a third eastbound and westbound through lane on Page Mill Road to the east of the I-280 Northbound Ramps intersection. The County would determine the ultimate improvement design and phasing for the corridor improvements. The proposed Project's fair-share funding contribution identified for Intersection #13 may be applied toward a roundabout at the I-280 Southbound Ramps intersection if the County chooses, and the timing of this improvement would also be determined by the County.

- **Intersection #17: Contribute fair-share funding to the installation of an overlap signal phase for northbound and southbound right-turning vehicles at the signalized intersection of Junipero Serra Boulevard – Foothill Expressway / Page Mill Road; widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane; and addition of a third westbound through lane and associated receiving lane and installation of a westbound right turn overlap phase.**

  Installation of an overlap phase for northbound, southbound and westbound right-turning vehicles would be accommodated through the modification of the existing traffic signal. Widening southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road likely would require the acquisition of additional right-of-way. This improvement would allow southbound right-turning vehicles additional queuing space so that southbound through vehicles do not block the right-turn lane. The new westbound through lane and receiving lane would require some right-of-way from the subdivision corner (northeast corner) and along the dish parcel for the receiving lane (northwest corner).

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5

and QOS 4, respectively. With the proposed mitigation, a second lane would be added traveling southbound between Stanford Avenue and Page Mill Road, aligning with the existing designated southbound right-turn lane at Page Mill Road, and would not impact the existing intersection configuration of the southbound approach. A third through lane would be added to the westbound approach and continued on the westbound receiving lanes, requiring additional right-of-way, and increasing the pedestrian crossing distance on the east and west legs of the intersection. In addition, the north/south bicycle crossing distances would increase slightly due to the additional through lane while maintaining but not exacerbating the current uncomfortable conditions for bicyclists and pedestrians at the intersection.

It is noted that there are improvements identified for this intersection in the draft *Santa Clara County Expressway Plan 2040.* The first improvement, which is a Tier 1 (highest priority) improvement, would widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. This improvement is fully funded through Measure B but conservatively is not anticipated to be in place by 2035.

The second improvement, which is a Tier 3 (lowest priority) improvement, is to eliminate the intersection by grade-separating Page Mill Road above Junipero Serra Boulevard – Foothill Expressway. The grade separation improvements were not identified as mitigation for the proposed 2018 General Use Permit project because the mitigation measure for Intersection #17 which is a smaller project and would have fewer secondary environmental effects, mitigates the proposed Project's contribution to the cumulative impact to a less-than-considerable level by 2035. In addition, the grade separation project has not completed CEQA review, may not be approved, and may not receive funding.

- **Intersection #30: Contribute fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of- way would be required to construct this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 2 to 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #58: Contribute fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection and remain unchanged on all other approaches while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on the northbound and southbound approaches. The proposed mitigation measure would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

  See **Table 5.15-21** for mitigated LOS conditions.

TABLE 5.15-21
2018 BASELINE WITH PROJECT INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Project		Mitigation Measure	2018 Baseline With Project (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**137.4** 21.4	**F** C+	See MM 5.15-2(a) (Table 1)	46.5 18.3	D B-	LTS/SU
13	I-280 SB Ramps / Page Mill Road	Santa Clara County	LOS E (Warrant)	AM PM	**151.7** **85.9**	**F** **F**	**153.3** **88.3**	**F** **F**	See MM 5.15-2(a) (Table 1)	37.2 42.3	D+ D	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**101.5** **109.9**	**F** **F**	See MM 5.15-2(a) (Table 1)	**97.3** **97.7**	**F** **F**	SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	74.7 **95.8**	E **F**	See MM 5.15-2(a) (Table 1)	60.2 67.9	E E	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**55.7** **55.9**	**E+** **E+**	See MM 5.15-2(a) (Table 1)	54.7 54.8	D- D-	LTS/SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection;
SU = significant and unavoidable.

SOURCE: Fehr & Peers, September 2018.

Impact 5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions. (*Significant*)

Freeway Segments

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Freeway segments with significant Project impacts under 2018 Baseline with Project Conditions are:

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour);
- Southbound I-280
  - El Monte Road to Magdalena Avenue (PM peak hour).

There are limited options to widen these freeway segments due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. For these reasons, the proposed Project's freeway impacts would remain significant and unavoidable. However, Mitigation Measure 5.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fees from exceeding the No Net New Commute Trips standard to alternative programs that reduce vehicular trips.

Freeway Ramps

A freeway ramp analysis was conducted to assess increases in peak period ramp queue lengths with the addition of proposed Project traffic and the effects of those increased queues on freeway and local street operations. Ramp queuing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions. Thus, the results presented here are provided for information purposes only.

Freeway On-Ramps

As described above, there are freeway on-ramps equipped with ramp meters within the study area. Caltrans operates dynamic ramp metering rates based on queues on the freeways and on the ramps. Therefore, the on-ramp queues were evaluated at the minimum and maximum ramp metering rates to show the potential range of queues at the given ramp. As shown in **Table 5.15-22**, the Embarcadero Road on-ramp queue would surpass the available storage when the ramp metering rate operates at the maximum (900 vphpl) rate during the PM peak period under 2018 Baseline and 2018 Baseline With Project Conditions. All other queues would remain within the available storage

when operating at the maximum ramp metering rate. All queues would exceed the available storage when using the minimum ramp metering rate, although it is unlikely that the metering rate remains at the minimum rate, given the above-stated ability for the rate to change. **Table 5.15-23** shows the other (non-metered) on-ramps that provide access to Stanford.

TABLE 5.15-22
2018 FREEWAY METERED ON-RAMP QUEUING EVALUATION
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	2018 Baseline		2018 Baseline With Project	
			Ramp Volume	Min. / Max. Queue (feet)[c]	Ramp Volume	Min. / Max. Queue (feet)[c]
Oregon Expressway (US 101 Southbound)	1,400	AM PM	1,383 1,305	30 / **20,280** 30 / **67,140**	1,389 1,308	30 / **20,400** 30 / **68,370**
Embarcadero Road (US 101 Southbound)	1,150	AM PM	817 803	30 / **18,630** **1,890 / 31,770**	833 835	30 / **19,500** **2,490 / 35,010**

NOTES: **Bold** text indicates conditions where the queue exceeds the available storage capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.

[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.

[c] Minimum queues estimated using the maximum metering rates provided by Caltrans. Maximum queues estimated using the minimum metering rates provided by Caltrans. The minimum queue is one vehicle, which is equal to 30 feet.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

TABLE 5.15-23
2018 FREEWAY NON-METERED ON-RAMP VOLUMES AND STORAGE CAPACITY
(2018 BASELINE AND 2018 BASELINE WITH PROJECT)

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	2018 Baseline Volume	2018 Baseline With Project Volume
US 101 Northbound On-Ramps				
Willow Road	650	AM PM	372 243	374 249
University Avenue	880	AM PM	381 202	383 206
I-280 Northbound On-Ramps				
Sand Hill Road	1,460	AM PM	631 1,516	675 1,617
Alpine Road	1,000	AM PM	360 710	360 710
Page Mill Road	700	AM PM	740 430	756 459
I-280 Southbound On-Ramps				
Page Mill Road	1,500	AM PM	606 948	650 1,037
Alpine Road	650	AM PM	377 563	377 563
Sand Hill Road	800	AM PM	390 1,200	398 1,211

NOTES: **Bold** text indicates conditions where the queue exceeds the available storage capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.

[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

Freeway Off-Ramps

Off-ramp queues that terminate at an intersection were evaluated using ramp-terminal intersection queue estimates from the intersection LOS calculations (see **Table 5.15-24**). Slip ramps where there is no control device (e.g., no signal or stop sign) and the ramp merges with the local street were evaluated using V/C ratios (see **Table 5.15-25**).

TABLE 5.15-24
2018 FREEWAY OFF-RAMP QUEUING EVALUATION (2018 BASELINE AND 2018 BASELINE WITH PROJECT): SIGNALIZED AND STOP-CONTROLLED TERMINAL INTERSECTIONS

Off-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	2018 Baseline		2018 Baseline With Project	
			Ramp Volume[c]	Queue (feet)[d]	Ramp Volume[c]	Queue (feet)[d]
US 101 Southbound Off-Ramps						
University Avenue	1,870 / 190	AM PM	262 / 360 191 / 560	480 / **630** 300 / **660**	265 / 360 194 / 560	480 / **630** 300 / **690**
I-280 Northbound Off-Ramps						
Sand Hill Road	740 / 300	AM PM	100 / 710 50 / 300	90 / **1,740** 60 / **510**	100 / 713 50 / 305	90 / **1,860** 60 / **540**
Alpine Road [f]	1,360 / 280	AM PM	250 / 881 130 / 272	30 / [e] 30 / [e]	250 / 911 130 / 293	30 / [e] 30 / [e]
Page Mill Road	60 / 1,830	AM PM	140 / 1,839 50 / 341	**90** / [e] 30 / [e]	140 / 1,926 50 / 406	**90** / [e] 30 / [e]
I-280 Southbound Off-Ramps						
Alpine Road	1,370 / 450	AM PM	390 / 520 160 / 270	240 / [e] 60 / [e]	390 / 520 160 / 270	240 / [e] 60 / [e]
Page Mill Road [f]	150 / 1,940	AM PM	1,140 / 50 820 / 100	**810** / [e] **330** / [e]	1,143 / 50 827 / 100	**810** / [e] **330** / [e]

Bold text indicates conditions where the queue exceeds the turn pocket capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements. Storage Capacity for a Controlled Ramp - ##/## = left-turn and (or) through pocket / right-turn pocket
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] Ramp volume by turning movement - ##/## = left-turn and (or) through movement / right-turn movement
[d] The queue indicated represents the 95th Percentile Queue for signalized movements and the Average Queue for stop- controlled movements - ##/## = left-turn and (or) through queue / right-turn queue
[e] Only left-turn movement is stop-controlled. Free right-turn queues are not provided.
[f] For all-way stop-controlled ramp intersections, the average queue is reported due to the limitations of the *2000 HCM*.

SOURCE: Fehr & Peers, September 2018.

TABLE 5.15-25
2018 FREEWAY OFF-RAMP QUEUING EVALUATION (2018 BASELINE AND 2018 BASELINE WITH PROJECT): UNCONTROLLED TERMINAL INTERSECTIONS

Off-Ramp	Maximum Vehicle Flow Rate (Capacity, vphpl)[a]	Peak Period[b]	2018 Baseline		2018 Baseline With Project	
			Ramp Volume	Volume-to-Capacity Ratio	Ramp Volume	Volume-to-Capacity Ratio
US 101 Northbound Off-Ramps						
Embarcadero Road	1,800	AM PM	644 510	0.36 0.28	681 530	0.38 0.29
US 101 Southbound Off-Ramps						
Willow Road	1,900	AM PM	433 402	0.23 0.21	440 405	0.23 0.21
I-280 Northbound Off-Ramps						
Alpine Road [c]	1,900	AM PM	881 272	0.46 0.14	911 294	0.48 0.15
Page Mill Road [c]	1,900	AM PM	1,839 341	0.97 0.18	1,926 406	**1.01** 0.21
I-280 Southbound Off-Ramps						
Sand Hill Road	1,800	AM PM	2,065 722	**1.15** 0.40	2,179 782	**1.21** 0.43
Alpine Road [c]	1,900	AM PM	520 270	0.27 0.14	520 270	0.27 0.14
Page Mill Road [c]	1,900	AM PM	50 100	0.03 0.05	50 100	0.03 0.05

Bold text indicates the off-ramp does not have sufficient capacity to accommodate the exiting volumes.

[a] Diagonal ramps were assumed to have a capacity of 1,900 vehicles per hour per lane (vphpl). Loop ramps were assumed to have a capacity of 1,800 vphpl.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] The right-turn movement is uncontrolled. Therefore, the right-turn volume and V/C is the only ramp movement reported in the table.

SOURCE: Fehr & Peers, September 2018.

As shown in Table 5.15-24, all off-ramps would accommodate vehicle queues within the available ramp storage, with the exception of the I-280 / Sand Hill Road northbound off-ramp, on which excessive queues would result in a queue spillback onto the freeway mainline of 1,000 feet and 1,120 feet under 2018 Baseline and 2018 Baseline with Project Conditions, respectively. Additionally, the following queues would exceed the available turn-pocket storage queue:

- US 101 / University Avenue southbound loop off-ramp – right-turn queue would exceed pocket storage length during the AM and PM peak periods, without and with the Project
- I-280 / Sand Hill Road northbound diagonal off-ramp – right-turn queue would exceed pocket storage length during the AM and PM peak periods, without and with the Project
- I-280 / Page Mill Road northbound diagonal off-ramp – left-turn queue would exceed pocket storage length during the AM peak period, without and with the Project
- I-280 / Page Mill Road southbound diagonal off-ramp – left-turn queue would exceed pocket storage length during the AM and PM peak periods, without and with the Project

While these turn queues would exceed the available turn pocket storage, the queues would still be served within the total ramp storage, and would not spillback into the freeway mainline.

As shown in Table 5.15-25, most of the V/C ratios (for 2018 Baseline and 2018 Baseline With Project Conditions) for the off-ramps with uncontrolled terminal intersections for the AM and PM peak periods would be less than 1.00, indicating that the off-ramps have sufficient capacity to accommodate the exiting volumes at these locations, with the following exceptions:

- I-280 / Page Mill Road northbound off-ramp (No Project V/C is 0.97, With Project V/C is 1.01, in the AM peak period);
- I-280 / Sand Hill Road southbound off-ramp (No Project V/C is 1.15, With Project V/C is 1.21, in the AM peak period).

  Mitigation Measure: Implement Mitigation Measure 5.15-2(a).

  Significance after Mitigation: Significant and Unavoidable.

As stated above, there are limited options to widen these freeway segments due to right-of-way constraints, and mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 5.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fees from exceeding the No Net New Commute Trips standard to alternative programs that reduce vehicular trips. Nevertheless, because it is uncertain whether implementation of the improvements would occur, the proposed Project's freeway impacts would remain significant and unavoidable.

Impact 5.15-4: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. The proposed 2018 General Use Permit does not propose infrastructure changes outside the Project site and, thus, would not interfere with the ability of transit agencies to modify or expand service.

The proposed Project would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 5.15-26**, the proposed Project would not add substantial delays relative to the total route travel time to any of the transit routes assessed. The additional delay would be fewer than 15 seconds on all but two of the routes, and fewer than 21 seconds in all cases.

TABLE 5.15-26
2018 BASELINE WITH PROJECT TRANSIT ROUTE DELAYS

Route		Direction	Peak Hour	Increased Average Delay with Project (seconds)
VTA 22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM PM	< 5.0 14.3
		Westbound	AM PM	10.9 7.0
VTA 35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM PM	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0
VTA 89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM PM	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0
VTA 102	South San Jose to Palo Alto	Northbound	AM	< 5.0
		Southbound	PM	7.1
VTA 104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0
		Westbound	AM	14.4
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM PM	< 5.0 16.0
		Westbound	AM PM	10.9 7.0
SamTrans 281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM PM	5.1 < 5.0
		Westbound	AM PM	< 5.0 < 5.0
SamTrans ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM PM	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0
AC Transit DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM PM	< 5.0 < 5.0
		Westbound	AM PM	< 5.0 < 5.0
AC Transit DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM PM	<5.0 9.3
		Westbound	AM PM	20.8 13.3
AC Transit U	Fremont BART to Stanford Oval	Eastbound	PM	12.3
		Westbound	AM	< 5.0
Palo Alto Shuttle E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM PM	< 5.0 5.3
		Westbound	AM PM	< 5.0 < 5.0
Palo Alto Shuttle C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM PM	< 5.0 < 5.0
		Westbound	AM PM	< 5.0 < 5.0

SOURCE: Fehr & Peers, September 2018.

Therefore, the proposed Project's impact on transit services would be less than significant.

Mitigation: None required.

Impact 5.15-5: Implementation of the proposed Project would not substantially increase intrusion by traffic in nearby neighborhoods. (*Less than Significant*)

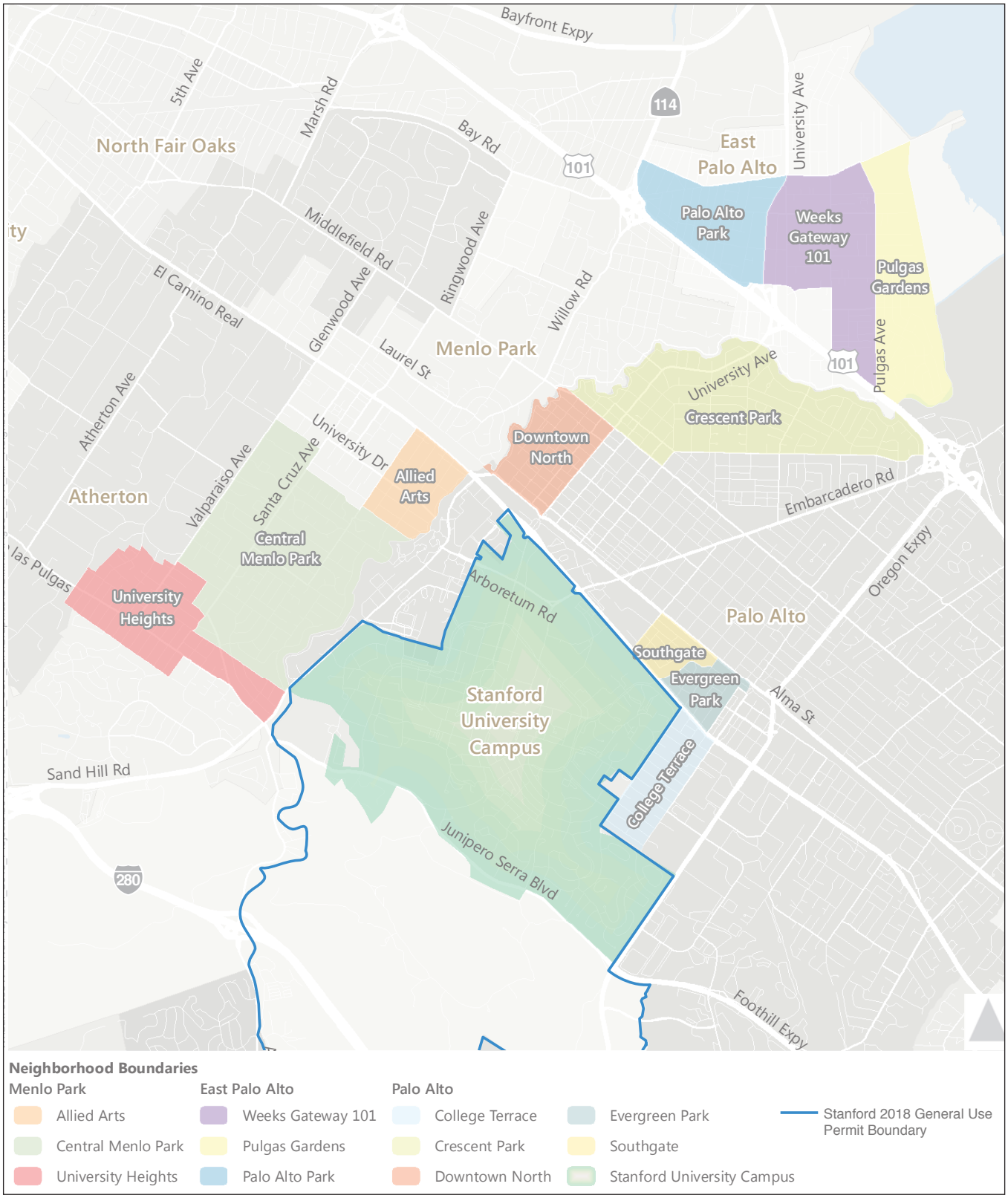
Traffic impacts on residential streets were estimated using the Traffic Infusion on Residential Environment (TIRE) methodology, which empirically determines the potential impact on residential streets based on the premise that any increase in traffic that would cause an index increase of 0.1 or more would be noticeable to residents. The TIRE index is based on a logarithmic scale, and is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling, or playing. The TIRE indices values range from zero (representing the least noticeable effect on traffic) to five (representing the most severe effect). The index and associated traffic thresholds relative to existing volumes are included in Appendix N of the TIA, in Appendix TIA-REV in in this EIR).

Stanford is surrounded by residential neighborhoods located in the cities of Palo Alto (College Terrace, Southgate, Evergreen Park, Downtown North, and Crescent Park) and Menlo Park (University Heights, Central Menlo Park, and Allied Arts) that currently experience some level of neighborhood traffic congestion, and are shown in **Figure 5.15-9**. In addition to these nearby neighborhoods in Menlo Park and Palo Alto, there are three neighborhoods in the City of East Palo Alto (Palo Alto Parks, Weeks – Gateway 101, and Pulgas Gardens) that currently experience cut-through traffic due to the volume of regional traffic using the Dumbarton Bridge. Due to the existing congestion on University Avenue and Willow Road, these neighborhoods are potential cut-through traffic locations.

Since the approval of the 2000 General Use Permit, there have been a number of efforts to reduce and/or eliminate travel through these neighborhoods generated by Stanford. These efforts include the following actions:

- **Sand Hill Road Corridor Project (2003)** – The Sand Hill Road Corridor Project resulted in widening and realignment of Sand Hill Road between Santa Cruz Avenue and Arboretum Road, and an extension from Arboretum Road to El Camino Real. Also, Santa Cruz Avenue was widened and realigned from Sand Hill Road to Alpine Road, with a realignment of the Alpine Road/Junipero Serra Boulevard intersection.

Prior to the construction of the Sand Hill Road Corridor Project, there was a two-lane bridge over San Francisquito Creek that created a bottleneck on Sand Hill Road during both the morning and evening peak travel periods. In addition, Sand Hill Road did not extend to El Camino Real. These two conditions limited both the accessibility and capacity of Sand Hill Road for trips between Santa Cruz Avenue and El Camino Real, and as a result, drivers chose alternative routes that passed through downtown Menlo Park. The combination of improvements within the corridor reduced the need for drivers to seek alternative routes through the University Heights, Central Menlo Park, and Allied Arts neighborhoods. For this reason, these neighborhoods are not included in the present Neighborhood Streets assessment.



SOURCE: Fehr & Peers

Stanford 2018 General Use Permit . 160531

Figure 5.15-9
Location of Neighborhoods Considered for Street Assessment

- **Downtown North Traffic Calming Study (2004)** – This was an effort to restrict through movements and turning movements during peak traffic periods to reduce or eliminate neighborhood traffic impacts in downtown Palo Alto between Middlefield Road and Alma Street. Based on input from the neighborhood, a plan was implemented that included the following traffic calming elements:

  – Street closure at Middlefield Road/Palo Alto Avenue

  – Traffic circles at the intersections of Everett Avenue/Emerson Street, Hawthorne Avenue/Cowper Street, and Everett Avenue/Webster Street

  – Speed tables on Palo Alto Avenue and Hawthorne Avenue between Alma Street and Emerson Street

  – Time-limited left-turn restrictions during the morning and evening peak periods from Alma Street to Hawthorne Avenue and Everett Avenue

  – Time-limited right-turn restrictions during the morning peak period from Middlefield Road to Hawthorne Avenue and Everett Avenue

  These improvements have been effective at reducing through traffic in Downtown North while allowing access and mobility to the residents. For this reason, this neighborhood has not been included in the Neighborhood Streets assessment.

- **College Terrace Traffic Calming Project (2004)** – A traffic calming study was conducted for the neighborhood to develop additional traffic calming measures to reduce the potential for neighborhood traffic impacts from through traffic. College Terrace had a number of street closures that were designed to reduce through traffic in the neighborhood prior to the 2004 study. A new traffic calming plan was tested that included the installation of five traffic circles and five speed tables within the neighborhood. Four traffic circles were constructed on College Avenue at Yale Street, Oberlin Street, Hanover Street, and Columbia Street. A fifth traffic circle was constructed at Yale Street and Cambridge Avenue. Four speed humps were constructed on Stanford Avenue and three speed humps on California Avenue. Following a test period, the traffic calming plan was refined to include the following improvements:

  – Traffic circles on Yale Street at College Avenue and Cambridge Avenue

  – Four speeds humps on Stanford Avenue at Wellesley Street, Oberlin Street, Dartmouth Street, and Amherst Street

  – Three speed humps on California Avenue at Wellesley Street, Oberlin Street, and Dartmouth Street

  – Four speed humps on College Avenue at Wellesley Street, Princeton Street, Harvard Street and Dartmouth Street

  – Center median islands were added at Oberlin Street/College Avenue, Hanover Street/College Avenue and Columbia Street/College Avenue

  The before-and-after studies of the neighborhood indicated that the traffic calming program has reduced the number and speed of vehicles in the neighborhood.

While there have not been any new traffic calming studies in the Southgate and Evergreen Park neighborhoods since the preparation of the 2000 General Use Permit, these neighborhoods have some existing traffic calming features that reduce the potential for vehicle trips through the neighborhood. Even without the existing traffic calming, the location and design of the roadway network eliminates any advantage in traveling through the neighborhood to access the Stanford campus. In addition, there are existing barriers in the Southgate and Evergreen neighborhoods that make it difficult to use the roadways to pass through the neighborhood, as follows:

- The vehicle barrier at the intersection of Castilleja Way and Park Boulevard prevents vehicles from cutting through the neighborhood using Serra Street, Park Boulevard, Castilleja Way, and Mariposa Avenue to access Churchill Avenue;
- A partial barrier on Park Boulevard east of Oxford Avenue prevents westbound cut through traffic; and
- A road closure on Ash Avenue east of Stanford Avenue prevents pass through trips in either direction.

Instead of passing through the Southgate and Evergreen Park neighborhoods, travelers accessing the Stanford campus use Churchill Avenue along the northern edge of the Southgate neighborhood or Oregon Expressway and El Camino Real to the south and west, respectively. As these roadways are located on the edge of the neighborhoods, through traffic is not expected to travel within the neighborhoods. Therefore, these neighborhoods were not included in the Neighborhood Streets assessment, which focuses on pass through trips.

The three above-cited East Palo Alto neighborhoods are experiencing increased cut-through traffic during the economic recovery over the past few years. The Palo Alto Parks neighborhood lies between Willow Road and University Avenue and extends between US 101 on the south and Newbridge-Bay Road on the north. This neighborhood experiences cut-through by commuters traversing between Willow Road and University Avenue in order to avoid congestion on the arterials. The Weeks-Gateway 101 and Pulgas Garden neighborhoods, located east of University Avenue, experience cut-through traffic on Clarke Avenue and Pulgas Avenue between East Bayshore and Bay Road. These roadways parallel University Avenue and serve as bypasses of the congestion on University Avenue. Traffic using these roadways typically cross US 101 at Embarcadero Road. The level of cut-through traffic in the East Palo Alto neighborhoods is related to the growth in both local and regional traffic combined with the limited available capacity on the major roadways that serve the Dumbarton Bridge. However, the potential for traffic generated by the proposed 2018 General Use Permit on the area is small based on the trip generation and trip distribution analyses prepared for this Project, and further analysis of cut-through traffic in East Palo Alto neighborhoods is not warranted because the number of trips potentially generated by the Project would be too low to exceed the TIRE index significance threshold.

Based on the effectiveness of prior mitigation strategies described above, the current conditions within the neighborhoods, and the expected trip distribution and assignment under the proposed 2018 General Use Permit, two neighborhoods in Palo Alto (College Terrace and Crescent Park) were identified as locations where neighborhood traffic impacts might occur with the proposed growth in the 2018 General Use Permit. These locations were selected for the following reasons:

- **College Terrace** – The neighborhood lies along the southern boundary of the campus and shares access with Stanford Avenue, which is a primary access route to the campus. Even though the traffic calming measures instituted in this neighborhood appear to have been effective, there remains a concern that there are routes through the neighborhood that drivers from Stanford might use to travel between Stanford Avenue and California Avenue to access Page Mill Road or El Camino Real.

- **Crescent Park** – The neighborhood lies along University Avenue, which is a major access route to regional roadways such as US 101 and SR 84 (Dumbarton Bridge), and is a road used by some drivers accessing Stanford. There is existing congestion on the corridor that includes spillover traffic to parallel roadways such as Hamilton Avenue.

Neighborhood Descriptions

College Terrace Neighborhood

The College Terrace neighborhood is a primarily residential neighborhood bounded by Stanford Avenue on the north, California Avenue on the south, El Camino Real on the east, and Amherst Street on the west. The neighborhood is 12 blocks long and 2 blocks wide. Stanford Avenue forms a boundary between College Terrace and Stanford. The principal roadway connecting College Terrace to the Stanford campus is Bowdoin Street. College Avenue parallels Stanford Avenue and forms the central east-west street in the neighborhood. Several other smaller roadways connect Stanford Avenue to the residential campus community, Escondido Village, located on the north side on Stanford Avenue.

College Terrace was designed as a grid roadway network; however, in the 1970s, the grid pattern was modified with a number of road closures to discourage travel between Stanford Avenue and California Avenue. By 2012, additional permanent traffic calming strategies were implemented within the neighborhood, including traffic circles at two locations on Yale Street, multiple speed tables on Stanford Avenue, College Avenue, and California Avenue, and several locations where bollards prevent through vehicle traffic. These devices were designed to slow vehicles and further deter travel through the neighborhood.

Daily traffic counts were collected on Columbia Street, Hanover Street, Harvard Street, Oberlin Street, Princeton Street and Cornell Street to understand the extent of traffic diversion within the neighborhood. As there were no obvious signs of neighborhood traffic impacts in these counts, Stanford traffic was not observed to use these neighborhood streets to access the campus.

Crescent Park Neighborhood

The Crescent Park residential neighborhood straddles University Avenue and is bounded by Middlefield Road, Channing Avenue, Newell Road, Woodland Avenue, and San Francisquito Creek. University Avenue is a residential arterial within the Crescent Park neighborhood, providing access to and from Stanford, US 101, and the East Bay via the Dumbarton Bridge.

Daily traffic counts were collected on University Avenue, Hamilton Avenue, and Lytton Avenue to understand the extent of traffic diversion off University Avenue within the neighborhood. These counts show that, during the PM peak period, Hamilton Avenue sees an increase in traffic due to congestion on University Avenue. On a daily basis, Hamilton Avenue, just west of Lincoln Avenue,

carries about 16 percent of the combined volume (University Avenue plus Hamilton Avenue); however, between 4:00 – 7:00 PM, it carries about 67 percent. This higher percent is due to a combination of factors, including commuters destined for US 101 and points east diverting from University Avenue, and local traffic that avoids University Avenue due to the congestion.

College Terrace TIRE Analysis

As shown in **Table 5.15-27**, TIRE indices for the local streets serving Stanford in the College Terrace neighborhood range from 2.6 to 3.1.

TABLE 5.15-27
COLLEGE TERRACE NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Project Daily Trips[a]	Volume that Equates to 0.1 Change[b]	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index			
Columbia Street, between College Avenue and California Avenue	2	640	2.8	57	140	No
Hanover Street, between Stanford Avenue and College Avenue	2	1,160	3.1	76	290	No
Harvard Street, between Stanford Avenue and College Avenue	2	430	2.6	28	97	No
Oberlin Street, between Stanford Avenue and College Avenue	2	850	2.9	55	170	No
Princeton Street, between College Avenue and California Avenue	2	610	2.8	54	140	No
Cornell Street, between College Avenue and California Avenue	2	370	2.6	33	97	No

[a] Assumes 20% of the added daily Stanford traffic east of Bowdoin Street on Stanford Avenue.
[b] Minimum daily traffic volume increase to produce an impact.

SOURCE: Fehr & Peers, September 2018.

A driver traveling through the College Terrace neighborhood on his or her way to the Stanford campus would most likely access the campus at the Bowdoin Street gateway because Oberlin Street, Wellesley Street and Yale Street primarily serve the graduate student residents in Escondido Village, and access to the main campus is blocked at Escondido Road. Based on traffic counts presented in the *Stanford University Traffic Monitoring Report (2015)*, about ten percent of Stanford-related trips travel in and out of the campus at Bowdoin Street. Based on the 2018 General Use Permit's proposed distribution of development on campus, this percentage is not expected to change substantially under the proposed 2018 General Use Permit. Applying this percentage to the new daily trips estimated for the proposed 2018 General Use Permit yields an estimate that about 1,892 vehicles per day would use Bowdoin Street to access Stanford.

Many of the daily trips that access the Stanford campus at Bowdoin Street do not pass through the College Terrace neighborhood, as there is a barrier at the entrance to the College Terrace neighborhood at Bowdoin Street, and all vehicles entering or exiting the campus at Bowdoin Street must also use Stanford Avenue. Vehicles traveling to or from the campus by way of the

portion of Stanford Avenue that is to the west of Bowdoin Street do not pass through the College Terrace neighborhood. Vehicles traveling to or from the campus by way of the portion of Stanford Avenue that is to the east of Bowdoin Street can continue on Stanford Avenue directly to El Camino Real. These vehicles also do not pass through the College Terrace neighborhood. The only vehicles that travel through the College Terrace neighborhood are those that zig zag through the neighborhood by taking College Avenue or California Avenue to and from El Camino Real, or by taking Hanover Street to or from Page Mill Road. Vehicles cannot travel directly from Stanford Avenue to Page Mill Road on Hanover Street; there is a barrier at the intersection of California Avenue and Hanover Street that prevents through traffic.

Morning and afternoon peak period turning movement counts collected at the Bowdoin Street/Stanford Avenue intersection were used to estimate trip distribution along Stanford Avenue. Of the 1,892 additional daily trips accessing the campus at Bowdoin Street, it is estimated that 795 daily trips would travel on Stanford Avenue to the east of Bowdoin Street, thereby having the potential to pass through the College Terrace neighborhood.

Existing daily traffic volumes collected throughout the College Terrace neighborhood where Stanford traffic may use neighborhood streets were used to estimate trip distribution throughout College Terrace neighborhood. Due to the existing street closures and traffic calming devices, relatively few drivers are likely to choose to negotiate the circuitous route, as well as multiple stop signs and speed humps, to pass through the neighborhood to access El Camino Real; the alternative (Stanford Avenue) is a direct route to El Camino Real with fewer stops. Similarly, it is unlikely that a large number of drivers would choose to travel from Stanford Avenue to Page Mill Road through the College Terrace neighborhood given that multiple turns and out-of-way travel would be needed. For example, if a driver were to leave the campus at Bowdoin Street, they would need to turn left on Stanford Avenue, right on Hanover Street, right on College Avenue, left on Columbia Street and left on California Avenue to access Page Mill Road. The other options would be to use Stanford Avenue to access Peter Coutts to Junipero Serra Boulevard, or El Camino Real to access Page Mill Road.

While the traffic calming and circuitous routing minimizes the number of drivers electing to cut through the neighborhood, the analysis assumed (based on professional judgment and knowledge of the neighborhood traffic calming and routing) that approximately 20 percent of drivers who travel to and from the Stanford gateway via the east of Bowdoin Street might elect to pass through the neighborhood streets. Because the TIRE index is based on daily traffic volumes, and the greatest time savings for drivers cutting through the neighborhood would be during the morning or evening peak periods when El Camino Real, Page Mill Road and Junipero Serra Boulevard are congested, the 20 percent assumption is considered conservative.

To determine the likelihood that an upward or downward shift in this 20-percent assumption would affect the analysis results, a sensitivity analysis was completed to determine the percent of added Stanford traffic east of Bowdoin Street that would need to travel through the College Terrace streets in order to surpass the 0.1 TIRE index threshold. It was found that more than 50 percent of added daily Stanford traffic traveling east of Bowdoin Street on Stanford Avenue would need to travel through the neighborhood in order to surpass the 0.1 TIRE index threshold.

Given the extent of the existing traffic calming throughout the College Terrace neighborhood and the more direct routes that are available, it is not considered to be reasonably foreseeable that 50 percent of drivers would choose to pass through the College Terrace neighborhood.

While it is unlikely that even 20 percent of the added daily Stanford traffic traveling east of Bowdoin Street on Stanford Avenue would travel through the neighborhood, this percentage was used to demonstrate a conservatively-high analysis scenario. Project trip estimates along Oberlin Street, Harvard Street, Hanover Street, Cornell Street, Princeton Street, and Columbia Street were distributed based on the relative existing daily volumes on these roadways. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in Table 5.15-27**,** the Project would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact would be less than significant.

Crescent Park TIRE Analysis

As shown in **Table 5.15-28**, TIRE indices for the local streets serving Stanford in the Crescent Park neighborhood range from 3.5 to 3.7.

TABLE 5.15-28
CRESCENT PARK NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Project Daily Trips	Volume that Equates to 0.1 Change[a]	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index			
Lytton Avenue, between Middlefield Road and Fulton Street	2	2,940	3.5	76	825	No
Hamilton Avenue, between Middlefield Road and Fulton Street	2	5,580	3.7	145	1,250	No
Hamilton Avenue, between Hamilton Court and Lincoln Avenue	2	3,700	3.6	121	1,025	No
Hamilton Avenue, between Lincoln Avenue and Crescent Drive	2	3,400	3.5	106	825	No

[a] Minimum daily traffic volume increase to produce an impact.

SOURCE: Fehr & Peers, September 2018.

A driver traveling through the Crescent Park neighborhood on his or her way to the Stanford campus may be expected to access the campus at the University Avenue gateway. While the annual monitoring data from the *Stanford University Traffic Monitoring Report (2015)* was used for the College Terrace roadway analysis, the campus monitoring data could not be used for the Crescent Park neighborhood because of its distance from the campus. For the Crescent Park neighborhood analysis, an estimated four percent of Stanford-related trips was applied to University Avenue between downtown Palo Alto and US 101, based on the existing travel patterns to and from the campus. The percentage of trips using University Avenue that would be likely to divert to neighborhood roadways when passing through Downtown Palo Alto was then calculated. The potential diversion of this volume to parallel routes within the Crescent Park

neighborhood was based on an analysis of the relative existing daily traffic volumes on University Avenue, Lytton Avenue, and Hamilton Avenue for four different segments: east of Middlefield Road, west of Lincoln Avenue, east of Lincoln Avenue, and west of Woodland Avenue. The existing daily traffic volumes along each roadway in each segment were used to estimate potential daily trip distributions. For example, if the proposed 2018 General Use Permit is estimated to contribute 15 trips on University Avenue, while University Avenue has an existing 100 daily trips and Hamilton Avenue has an existing 50 trips, then ten additional Stanford trips would be assumed to use University Avenue, and five trips would be assumed to use Hamilton Avenue. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in Table 5.15-28, the effect of the proposed Project would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact would be less than significant. It should be noted that since the TIRE indices are based on the effect of the Project as a percentage of total traffic, the Project's effect on cumulative traffic conditions would be even less, and similarly less than significant.

Mitigation: None required.

Impact 5.15-6: Implementation of the proposed Project would not substantially increase hazards due to a design feature or incompatible uses. (*Less than Significant*)

The potential safety impacts of the proposed 2018 General Use Permit are evaluated based on whether any identified intersection mitigation measures would cause adverse safety effects for vehicles, transit, pedestrians, or bicyclists, and if the proposed Project would introduce incompatible uses (i.e., types of vehicles that differ from those currently on area roadways). The intersection mitigation measures would be constructed according to the design standards of the relevant jurisdiction/agency (i.e., where the intersection is located), which conform to industry standards for roadway and intersection design and operations. In addition, the secondary effects of the intersection mitigations on pedestrians and bicyclists are described for each mitigation measure (Impact 5.15-2, above, and Impact 5.15-9, below). Lastly, the mix of vehicles on area roadways (trucks, autos, etc.) would not materially change from existing conditions. Therefore, the mitigation measures and increased traffic would not cause adverse safety effects for vehicles, transit, pedestrians or bicyclists, and the Project's impact on safety is less-than-significant.

It is also noted that Stanford's proposed mitigation approach aims to eliminate congestion impacts and the need for the intersection mitigation measures. The approach includes a combination of trip reduction measures for trips to and from the Stanford campus, and trip reduction measures for trips outside the Project site within the impact area, incorporating both infrastructure projects and programs supporting non-auto modes. If successful, this approach would avoid the need to construct any of the intersection capacity mitigations.

Mitigation: None required.

Impact 5.15-7: Implementation of the proposed Project would not result in inadequate emergency access. (*Less than Significant*)

Emergency access can be impeded as a result of the construction of physical features that can block emergency access routes or make them more circuitous, or as a result of high levels of congestion that lengthen the response time of emergency providers. The proposed 2018 General Use Permit would not result in any infrastructure changes outside the Project site, and thus would not create fixed physical barriers to, or impede, emergency access. The proposed Project traffic analyses (Impact 5.15-2 above, and Impact 5.15-9 below) indicate significant impacts (increased congestion/delays) at intersections in both the 2018 with Project and 2035 Cumulative with Project conditions, and identifies intersection capacity mitigations, if feasible. Emergency responders are charged with developing fastest-response travel routes and assessing traffic conditions and developing alternate routes in real time to provide emergency services. Therefore, the identified significant impacts at area intersections would not result in inadequate emergency access within the study area, and the impact on emergency access under the Project and cumulative conditions would be less than significant.

Mitigation: None required.

Impact 5.15-8: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

A significant impact to bicycle or pedestrian facilities could occur when the proposed Project would create a hazardous condition that currently does not exist for pedestrians or bicyclists, or conflicts with planned facilities or local agency policies regarding bicycle and pedestrian facilities. The proposed 2018 General Use Permit would not result in any infrastructure changes outside the Project site and would preclude implementation of planned bicycle or pedestrian facilities, and thus, would not create hazardous conditions where none exist today, nor conflict with planned facilities or local agency policies.

However, several intersection capacity mitigation measures are identified (for Impact 5.15-2, above, and Impact 5.15-9, below). Therefore, the analysis of potential impacts also focuses on the proposed mitigations, as these could be effects of the Project if they are constructed. The analysis of each mitigation location also includes the effect of the daily traffic volume with the additional Project trips. The analysis found that none of the identified intersection improvements would substantially affect quality of service for pedestrians and bicyclists (i.e., no substantial worsening of QOS indices). In some cases, the mitigations would add another vehicle lane to cross or navigate as a bicyclist. However, these changes would not affect the QOS rating because it is already at 4 (the worst rating). As noted in the traffic mitigation discussions, the implementation of the mitigation measures would ultimately be the decision of the responsible jurisdiction, and considerations for bicyclist and pedestrian comfort and convenience may enter into those decisions, resulting in a modified improvement that adds or enhances pedestrian and/or bicycle facilities, or rejection of the identified mitigation measure.

In addition as described in Section 5.15.7, below, assessment of the bicycle facility capacity to serve future growth in bicycle commuters to the campus (based on existing bicycle counts at the campus gateways and estimates of future growth to 2018 and 2035 under the proposed 2018 General Use Permit) shows that the carrying capacities of bicycle paths and lanes in the various "bike shed" areas surrounding the campus exceed the estimated future growth in bicycle volumes.

For the above reasons, the proposed Project's impact on pedestrian and bicycle facilities under Project and cumulative conditions would be less than significant.

Separate from the above analysis, it is noted that the Project would construct improvements on its lands in unincorporated Santa Clara County that have been identified by the Palo Alto Unified School District (PAUSD) and the City of Palo Alto as the Suggested Routes to Schools shown on the Walkabout Maps for Nixon and Escondido Elementary Schools. These improvements would benefit both pedestrian and bicycle circulation in the immediate area of both schools. Circulation improvements on Stanford lands in unincorporated Santa Clara County, in and around Nixon Elementary School, could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, and wayfinding signs. Circulation improvements in and around Escondido Elementary School similarly could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, additional traffic control. Specific improvements on Stanford property could include an enhanced mid-block crosswalk on Escondido Road.

Mitigation: None required.

Cumulative Impacts

Impact 5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions. (*Significant*)

Project traffic congestion impacts are identified by comparing Cumulative 2035 Cumulative to 2035 Cumulative with Project Conditions. Significant impacts are identified based on the impact criteria presented in Table 5.15-9, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay and critical V/C ratios for intersections operating unacceptably.[8] Levels of service for 2035 Cumulative and 2035 Cumulative with Project conditions were calculated using the TRAFFIX 8.0 software, which uses the *2000 HCM* methodology and is consistent with VTA TIA guidelines. The results of the LOS analysis are summarized in **Table 5.15-29**.

[8] As stated above, it is Stanford's intent to avoid the need for intersection capacity improvements, by achieving the Stanford Community Plan's No Net New Commute Trips standard. However, to ensure that potential impacts are not understated, this analysis conservatively assumes that Stanford does not achieve the Plan's standard.

TABLE 5.15-29
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
1	I-280 NB On-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.3 12.6	B+ B	10.1 13.7	B+ B	0.015 0.032	-0.2 1.2
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**155.2** 18.6	**F** B-	**0.038** 0.021	**19.2** 0.2
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	37.9 21.5	D+ C+	49.6 22.3	D C+	0.037 0.032	18.3 1.4
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	19.4 30.1	B- C	19.6 29.8	B- C	0.036 0.031	0.5 -0.2
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	17.4 18.9	B B-	17.4 18.6	B B-	0.036 0.032	0.3 0.0
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	13.3 14.6	B B	13.3 14.5	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	51.3 46.2	D- D	52.8 47.2	D- D	0.030 0.038	2.1 1.7
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.5 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.1 0.1
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	24.3 29.4	C C	25.4 30.3	C C	0.028 0.022	1.7 0.9
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.7 26.8	C+ C	20.8 27.4	C+ C	0.009 0.017	0.4 0.7
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	25.3 31.7	C C	26.0 32.3	C C-	0.013 0.012	1.3 0.9
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	43.8 39.8	D D	43.6 40.3	D D	0.019 0.013	-3.1 0.6
13	I-280 SB Ramps / Page Mill Rd	Santa Clara County	LOS E	AM PM	37.0 44.7	D+ D	37.2 45.0	D+ D	0.003 0.003	0.3 0.2

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
14	I-280 NB Ramps / Page Mill Rd	Santa Clara County	LOS E	AM PM	14.4 12.4	B B	14.5 12.5	B B	0.005 0.004	0.6 0.7
15	Deer Creek Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	17.5 11.5	B B+	19.1 11.8	B- B+	0.026 0.021	2.7 0.1
16	Coyote Hill Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	8.9 8.5	A A	9.8 8.9	A A	0.014 0.021	0.0 -0.1
17	Junipero Serra Blvd - Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**186.9** **175.2**	**F** **F**	**0.028** **0.044**	**4.5** **27.8**
18	Peter Coutts / Page Mill Rd	Santa Clara County	LOS E	AM PM	22.3 30.5	C+ C	22.9 30.8	C+ C	0.020 0.015	0.8 0.0
19	Hanover St / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**92.1** 52.8	**F** D-	**0.025** 0.018	**11.2** 0.6
20	El Camino Real / Page Mill Rd – Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**84.9** **90.2**	**F** **F**	**0.047** **0.035**	**13.2** **11.0**
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.6** **103.6**	**F** **F**	**0.014** **0.012**	**4.7** **3.1**
22	Oregon Expy / West Bayshore Rd	Santa Clara County	LOS E	AM PM	23.4 20.8	C C+	23.4 21.0	C C+	0.003 0.008	0.0 0.1
23	I-280 SB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	42.0 16.7	E C	42.7 16.9	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	26.7 29.1	D D	27.8 32.5	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Rd	Menlo Park	LOS D	AM PM	48.1 50.6	D D	51.6 52.8	D- D-	0.049 0.029	4.6 1.7
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	30.1 44.1	C D	32.5 50.3	C- D	0.009 0.043	1.5 8.6

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14.0 17.8	B B	14.4 19.5	B B-	0.020 0.037	0.7 2.8
28	Junipero Serra Blvd / Stanford Ave	Santa Clara County	LOS E	AM PM	20.6 24.9	C+ C	22.4 29.9	C+ C	0.061 0.084	2.5 6.8
29	Foothill Expy / Hillview Ave	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**135.0** 64.2	**F** E	**0.024** 0.015	**16.1** 9.0
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**201.2** **208.9**	**F** **F**	**0.016** **0.095**	**10.4** **18.2**
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	43.2 **171.0**	D **F**	0.016 **0.021**	6.7 **8.1**
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**149.3** **137.9**	**F** **F**	**0.014** **0.004**	**13.5** **1.9**
33	Foothill Expy / Springer Road-Magdalena Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.9** **154.4**	**F** **F**	**0.014** **0.010**	**4.8** **5.1**
34	Bowdoin St / Stanford Ave*	Palo Alto	LOS E (warrant)	AM PM	16.7 25.8	C D	22.8 43.2	C E	N/A	N/A
35	Arboretum Rd / Quarry Rd	Palo Alto	LOS D	AM PM	46.8 43.3	D D	47.5 44.2	D D	0.040 0.039	1.3 1.8
36	Arboretum Rd / Palm Dr	Palo Alto	LOS D	AM PM	31.0 31.1	C C	32.4 32.5	C- C-	0.080 0.049	2.1 2.5
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.4 **92.9**	D **F**	0.007 **0.015**	1.4 **5.5**
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 **57.4**	D- **E+**	0.017 **0.015**	1.9 **2.7**
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	34.4 39.0	C- D+	34.1 38.9	C- D+	0.018 0.017	-0.2 0.0

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
40	El Camino Real / Santa Cruz Ave	Menlo Park	LOS D	AM PM	26.8 35.5	C D+	26.5 35.5	C D+	0.018 0.010	-0.1 0.0
41	El Camino Real / Ravenswood Rd	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.7 **65.8**	D **E**	0.008 **0.020**	1.0 **3.8**
42	El Camino Real / Roble Ave	Menlo Park	LOS D	AM PM	12.8 15.3	B B	12.7 15.2	B B	0.006 0.009	-0.1 -0.1
43	El Camino Real / Middle Ave	Menlo Park	LOS D	AM PM	25.1 28.5	C C	24.9 28.3	C C	0.014 0.009	-0.2 0.1
44	El Camino Real / Cambridge Ave	Menlo Park	LOS D	AM PM	15.2 24.8	B C	15.0 24.8	B C	0.014 0.009	-0.2 0.2
45	El Camino Real / Quarry Rd	Palo Alto	LOS D	AM PM	11.9 33.0	B+ C-	13.3 34.8	B C-	0.029 0.032	1.6 2.7
46	El Camino Real (SB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	21.0 22.7	C+ C+	20.7 22.5	C+ C+	0.016 0.031	-0.1 0.0
47	El Camino Real (NB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	27.3 25.2	C C	28.6 26.1	C C	0.008 0.016	0.5 0.7
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	60.4 **82.2**	E **F**	0.032 **0.059**	5.2 **20.0**
49	El Camino Real / Churchill Ave	Palo Alto	LOS D	AM PM	25.4 26.7	C C	25.4 26.6	C C	0.017 0.018	0.1 0.1
50	El Camino Real / Serra St	Palo Alto	LOS D	AM PM	24.6 29.3	C C	28.3 36.1	C D+	0.082 0.111	6.1 10.7
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	31.1 32.2	C C-	31.7 34.7	C C-	0.033 0.054	1.0 3.9
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	22.8 27.8	C+ C	22.1 27.5	C+ C	0.029 0.031	-0.4 0.0

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
53	El Camino Real / Arastradero Rd - Charleston Rd	Palo Alto (SC CMP)	LOS E	AM PM	67.1 68.7	E E	70.2 70.3	E E	0.020 0.019	5.5 3.8
54	El Camino Real / San Antonio Rd	Mountain View (SC CMP)	LOS E	AM PM	60.8 55.6	E E+	61.3 55.7	E E+	0.008 0.007	0.8 0.0
55	Alma St / Lytton Ave	Palo Alto	LOS D	AM PM	28.2 25.9	C C	30.9 27.1	C C	0.017 0.015	4.1 1.9
56	Alma St / Hamilton Ave	Palo Alto	LOS D	AM PM	10.2 **57.7**	B+ **E+**	10.4 **60.0**	B+ **E**	0.007 **0.012**	0.3 **5.0**
57	Alma St / Churchill Ave	Palo Alto	LOS D	AM PM	32.4 **59.2**	C- **E+**	32.5 **59.8**	C- **E+**	0.005 **0.006**	0.2 **1.0**
58	Alma St / Charleston Rd	Palo Alto	LOS D	AM PM	**123.4** **121.5**	**F** **F**	**127.3** **126.7**	**F** **F**	**0.009** **0.017**	**3.9** **6.6**
59	Middlefield Rd / Marsh Rd	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.7** **77.4**	**E-** **E-**	**0.012** **0.000**	**4.6** **0.0**
60	Middlefield Rd / Ravenswood Ave	Menlo Park	LOS D	AM PM	49.3 45.3	D D	51.0 46.7	D D	0.011 0.012	2.1 1.9
61	Middlefield Rd / Ringwood Ave	Menlo Park	LOS D	AM PM	43.2 52.6	D D-	43.4 52.9	D D-	0.004 0.006	0.2 0.4
62	Middlefield Rd / Willow Rd	Menlo Park	LOS D	AM PM	50.0 53.0	D D-	50.2 53.4	D D-	0.000 0.006	0.0 0.5
63	Middlefield Rd / Lytton Ave	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.1 **70.1**	D- **E**	0.018 **0.017**	2.1 **4.4**
64	Middlefield Rd / University Ave	Palo Alto	LOS D	AM PM	35.1 39.4	D+ D	35.6 40.8	D+ D	0.019 0.031	0.5 2.0
65	Middlefield Rd / Hamilton Ave	Palo Alto	LOS D	AM PM	10.5 10.8	B+ B+	10.6 10.9	B+ B+	0.005 0.007	0.1 0.1

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
66	Middlefield Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**59.4** **72.9**	**E+** **E**	**0.030** **0.025**	**5.8** **6.4**
67	Saint Francis Dr / Embarcadero Rd	Palo Alto	LOS D	AM PM	23.0 19.3	C+ B-	23.0 19.1	C+ B-	0.015 0.014	0.2 -0.1
68	E. Bayshore Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	**98.5** **77.7**	**F** **E-**	**99.0** **78.7**	**F** **E-**	**0.006** **0.004**	**0.5** **0.9**
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	**58.0** **67.7**	**E+** **E**	**58.3** **68.5**	**E+** **E**	**0.004** **0.007**	**0.4** **1.6**
70	US 101 SB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	**77.3** **78.0**	**E-** **E-**	**77.2** **77.9**	**E-** **E-**	**0.000** **0.000**	**0.0** **0.0**
71	US 101 NB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	23.2 41.1	C D	23.2 41.1	C D	0.000 0.000	0.0 0.0
72	Bay Rd / Willow Rd	Menlo Park	LOS D	AM PM	19.7 11.3	B- B+	19.7 11.3	B- B+	0.008 0.006	0.1 0.1
73	Newbridge St / Willow Rd	Menlo Park	LOS D	AM PM	42.7 53.6	D D-	42.7 53.9	D D-	0.005 0.004	0.1 0.6
74	O'Brien Dr / Willow Rd	Menlo Park	LOS D	AM PM	19.4 20.1	B- C+	19.4 20.0	B- C+	0.003 0.004	0.0 0.0
75	Hamilton Ave / Willow Rd	Menlo Park	LOS D	AM PM	41.3 40.9	D D	42.0 41.1	D D	0.005 0.004	1.2 0.3
76	Bayfront Expy / Willow Rd	Menlo Park (SM CMP)	LOS F	AM PM	51.1 64.9	D- E	51.1 65.3	D- E	0.000 0.004	0.0 0.6
77	Woodland Ave / University Ave	East Palo Alto	LOS D	AM PM	**71.7** **66.1**	**E** **E**	**72.7** **66.4**	**E** **E**	**0.000** **0.006**	**0.0** **0.9**
78	US 101 SB Ramps / University Ave	East Palo Alto	LOS D	AM PM	27.9 25.8	C C	28.0 25.8	C C	0.004 0.006	0.2 0.1

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[1a]	LOS Threshold[2] [b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[d]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
79	Donohoe St / University Ave	East Palo Alto	LOS D	AM PM	**76.3** 43.4	**E-** D	**77.1** 43.5	**E-** D	**0.005** 0.004	**1.3** 0.1
80	University Ave / Bay Rd	East Palo Alto	LOS D	AM PM	54.1 51.8	D- D-	54.4 52.4	D- D-	0.005 0.009	0.5 1.1
81	University Ave / Bayfront Expy	Menlo Park (SM CMP)	LOS F	AM PM	26.4 137.3	C F	26.6 140.0	C F	0.008 0.007	0.5 3.3
82	Town & Country Driveway / Embarcadero Rd	Palo Alto	LOS D	AM PM	27.8 28.3	C C	27.2 27.9	C C	0.031 0.021	-0.4 -0.3
83	Charleston Rd / San Antonio Rd	Palo Alto (SC CMP)	LOS E	AM PM	79.2 68.3	E- E	79.4 68.6	E- E	0.001 0.002	0.4 0.5
84	US 101 SB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	11.1 12.8	B+ B	11.2 12.8	B+ B	0.003 0.000	0.2 0.0
85	US 101 NB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	25.0 24.2	C C	25.1 24.2	C C	0.000 0.003	0.0 0.1
86	Central Expy / Rengstorff Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**447.1** **248.1**	**F** **F**	**449.7** **250.5**	**F** **F**	**0.010** **0.008**	**2.2** **2.6**
87	Central Expy / Shoreline Blvd (N)	Santa Clara County (SC CMP)	LOS E	AM PM	**224.5** **97.4**	**F** **F**	**223.6** **97.1**	**F** **F**	**0.004** **0.006**	**0.2** **-0.1**
88	Central Expy / Shoreline Blvd (S)	Santa Clara County (SC CMP)	LOS E	AM PM	11.2 7.5	B+ A	11.2 7.5	B+ A	0.003 0.005	-0.1 0.0
89	Central Expy / Castro St-Moffett Blvd	Santa Clara County (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**243.7** **225.7**	**F** **F**	**0.010** **0.009**	**5.2** **4.5**
90	Foothill Expy / Edith Ave	Santa Clara County	LOS E	AM PM	55.9 **105.5**	E+ **F**	61.5 **112.6**	E **F**	0.016 **0.015**	10.2 **11.8**
91	Foothill Expy / Main St	Santa Clara County (SC CMP)	LOS E	AM PM	44.6 54.8	D D-	49.9 55.8	D E+	0.016 0.009	8.5 -1.3

TABLE 5.15-29 (CONTINUED)
2035 INTERSECTION LEVELS OF SERVICE
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Cumulative (2035) No Project		Cumulative (2035) With Project			
					Delay[d]	LOS[e]	Delay[a]	LOS[e]	Δ in Crit. V/C[f]	Δ in Crit. Delay[g]
92	University Ave / O'Brien Dr	Menlo Park	LOS D	AM PM	9.1 13.4	A B	9.1 13.3	A B	0.005 0.006	0.0 0.0
93	University Ave / Adams Dr*	Menlo Park	LOS E (warrant)	AM PM	425.5 39.6	F[h] E	456.2 41.4	F[h] E	N/A	N/A
94	University Ave / Runnymede St	East Palo Alto	LOS D	AM PM	15.3 19.1	B B-	15.3 19.1	B B-	0.005 0.005	0.0 0.0
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 17.3	B B	14.7 17.2	B B	0.005 0.005	0.0 0.0

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.
In some cases, intersections may show a reduction in average delay with the addition of Project traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

a Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County; "(SM CMP)" indicates CMP intersection in San Mateo County

b LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.

c AM = morning peak traffic hour, PM = evening peak traffic hour.

d Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.

e LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.

f Change ("Δ") in critical volume-to-capacity ratio (V/C) between Cumulative (2035) and Cumulative (2035) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

g Change ("Δ") in average critical movement delay between Cumulative (2035) and Cumulative (2035) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

h A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, September 2018.

The intersections where the proposed Project would have a significant impact under 2035 Cumulative with Project conditions, and the reason that the impact is considered significant, are documented in **Table 5.15-30**. Measures/strategies to mitigate the contribution of the proposed Project to significant cumulative impacts are described below.

Mitigation Measure: Implement Mitigation Measure 5.15-2(a)-(b).

TABLE 5.15-30
2035 CUMULATIVE WITH PROJECT INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#17 Junipero Serra Blvd – Foothill Expressway / Page Mill Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#19 Hanover Street / Page Mill Road (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#20 El Camino Real / Page Mill Road – Oregon Expressway (AM and PM Peak Hours)	**VTA:** During the AM peak hour, project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F. During the PM peak hour, under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#21 Middlefield Road / Oregon Expressway (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#29 Foothill Expressway / Hillview Avenue (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#31 Foothill Expressway / San Antonio Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#32 Foothill Expressway / El Monte Avenue (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#33 Foothill Expressway / Springer Road – Magdalena Avenue (AM and PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.

TABLE 5.15-30 (CONTINUED)
2035 CUMULATIVE WITH PROJECT INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#37 El Camino Real / Encinal Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#38 El Camino Real / Valparaiso Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#41 El Camino Real / Ravenswood Road (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#48 El Camino Real / Embarcadero Road (PM Peak Hour)	**VTA:** Project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F.
#56 Alma Street / Hamilton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#59 Middlefield Road / Marsh Road (AM Peak Hour)	**Atherton:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#63 Middlefield Road / Lytton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#66 Middlefield Road / Embarcadero Road (AM and PM Peak Hours)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#89 Central Expwy / Castro St. – Moffett Blvd. (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#90 Foothill Expressway / Edith Avenue (PM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.

As detailed in Mitigation Measure 5.15-2(a), Stanford shall mitigate the peak hour, peak direction transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts. Further, Mitigation Measure 5.15-2(b) requires that Stanford mitigate the peak-hour, off-peak direction (reverse commute) transportation impacts of its additional development and population growth through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts.

Significance after Mitigation: Significant and Unavoidable.

This mitigation would substantially reduce the Project's contribution to cumulative traffic congestion impacts to intersections; however, the Project's contribution to the cumulative impact would be a significant and unavoidable impact because there is no feasible mitigation to improve some of the affected intersections, and for others it is uncertain whether it would be feasible to improve the intersections if the No Net New Commute Trips standard is not achieved or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2035 Cumulative with Project conditions identified in Table 1 in Mitigation Measure 5.15-2(a) are located in other jurisdictions, and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. At one intersection, the mitigation measure would improve LOS and delay, but would not mitigate impacts to a less-than-significant level. At other intersections, there are no feasible improvements to reduce the impact to a less-than-significant level. For these reasons, the impact would remain significant and unavoidable.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the proposed Project, the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are discussed below. In all cases, these effects are determined to be less than significant.

- **Intersection #2: Implement the same mitigation identified for this intersection under 2018 Baseline with Project conditions, which stipulates contribution of fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report*.**

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #17: Implement the same mitigation identified for this intersection under 2018 Baseline with Project conditions, which stipulates contribution of fair-share funding to the installation of an overlap signal phase for northbound and southbound right-turning vehicles at the signalized intersection of Junipero Serra Boulevard – Foothill Expressway / Page Mill Road; widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane; and addition of a third westbound through lane and associated receiving lane and installation of a westbound right turn overlap phase.**

  Installation of an overlap phase for northbound, southbound and westbound right-turning vehicles would be accommodated through the modification of the existing traffic signal. Widening southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road likely would require the acquisition of additional right-of-way. This improvement would allow southbound right-turning vehicles additional queuing space so that southbound through vehicles do not block the right-turn lane. The new westbound through lane and receiving lane would require some right-of-way from the subdivision corner (northeast corner) and along the dish parcel for the receiving lane (northwest corner).

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 and QOS 4, respectively. With the proposed mitigation, a second lane would be added traveling southbound between Stanford Avenue and Page Mill Road, aligning with the existing designated southbound right-turn lane at Page Mill Road, and would not impact the existing intersection configuration of the southbound approach. A third through lane would be added to the westbound approach and continued on the westbound receiving lanes,

requiring additional right-of-way, and increasing the pedestrian crossing distance on the east and west legs of the intersection. In addition, the north/south bicycle crossing distances would increase slightly due to the additional through lane while maintaining but not exacerbating the current uncomfortable conditions for bicyclists and pedestrians at the intersection.

It is noted that there are improvements identified for this intersection in the draft *Santa Clara County Expressway Plan 2040.* The first improvement, which is a Tier 1 (highest priority) improvement, would widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. This improvement is fully funded through Measure B but conservatively is not anticipated to be in place by 2035.

The second improvement, which is a Tier 3 (lowest priority) improvement, is to eliminate the intersection by grade-separating Page Mill Road above Junipero Serra Boulevard – Foothill Expressway. The grade separation improvements were not identified as a mitigation for the proposed 2018 General Use Permit project because the mitigation measure for Intersection #17 which is a smaller project and would have fewer secondary environmental effects, mitigates the proposed Project's contribution to the cumulative impact to a less-than-considerable level by 2035. In addition, the grade separation project has not completed CEQA review, may not be approved, and may not receive funding.

- **Intersection #19: Contribute fair-share funding to installation of a second westbound left-turn lane, at the signalized intersection of Hanover Street / Page Mill Road, identified as an option in the *Page Mill Expressway Corridor Study Report*.**

  To accommodate the construction of a second westbound left-turn lane, the westbound approach would need to be widened from three to four lanes and may require the removal of the center median, reduction in lane width, and/or reduction in bicycle lane width at the intersection. There is adequate right-of-way to accommodate the dual westbound left-turn lanes and associated receiving lanes on Hanover Street.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4 and QOS 3, respectively. With the proposed mitigation, limited bicycle facilities on Hanover Street would remain, as well as the intersection crossing distance, maintaining but not exacerbating the current uncomfortable conditions for bicyclists at the intersection. Pedestrian crossing distances would be unchanged on all approaches. The proposed mitigation measure would not create additional conflicts for the City of Palo Alto's proposed Class I facility on the south side of Page Mill Road as identified in their *Bicycle and Pedestrian Transportation Plan*.

It is noted that there is another Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*. The improvement would convert the signal phasing to an eight-phase signal. That improvement would not reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. Therefore, it was not identified as a mitigation measure. The proposed mitigation measure for Intersection 19 would not conflict with the County's Tier 1 intersection improvement.

- **Intersection #20: Contribute fair-share funding to the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, at the signalized intersection of El Camino Real / Page Mill Road – Oregon Expressway, as identified in the *Page Mill Expressway Corridor Study Report*.**

  To accommodate the reconfiguration of the east leg of the intersection, parking would need to be removed along the south side of Page Mill Road, and the median island would need to be shifted to the south to accommodate the additional westbound lane. Little to no right-of-way would be needed to accommodate this improvement; however, an easement would be needed on the north side of the roadway to preserve the sidewalk width, and the bus stop on the southeast corner of the intersection on Oregon Expressway may need to be relocated or further addressed during design. These improvements are identified in Santa Clara County's *Page Mill Corridor Expressway Plan*, and the extension of the double westbound left-turn lanes is identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040* along with enhanced pedestrian facilities on the southwest and southeast corners of the intersection.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. However, because this improvement depends on the actions of Caltrans, and the provision of the remaining improvements may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the Project's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions assuming the parking is removed next to the eastbound receiving lanes, and right-turn slip lanes and/or high vehicle turning speeds would remain, maintaining the current uncomfortable conditions for bicyclists and pedestrians at the intersection. The proposed mitigation measure would not conflict with the City of Palo Alto's *Bicycle and Pedestrian Transportation Plan* to implement a Class III facility on Oregon Expressway east of the intersection.

- **Intersection #30: Implement the same mitigation identified for this intersection under 2018 Baseline with Project conditions, which stipulates contribution of fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of- way would be required to construction this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #31: Contribute fair-share funding to the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue.**

  A third receiving lane would be added on the south leg of Foothill Expressway, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040*, to extend the southbound right-turn lane from El Monte Avenue to San Antonio Road, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, as it would remain unchanged at QOS 4. With the proposed mitigation, right-turn slip lanes and high vehicle turning speeds would remain,

maintaining the current uncomfortable environments for bicyclists at the intersection. The proposed mitigation measure would have no effect on pedestrian quality of service as there is no pedestrian access at this intersection.

It is noted that the full Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #31 would implement the southbound widening.

- **Intersection #32: Contribute to fair-share funding to the addition of a third northbound through lane, and an associated receiving lane at the signalized intersection of Foothill Expressway / El Monte Avenue, as identified in the draft *Santa Clara County Expressway Plan 2040.***

  To accommodate the construction of a third northbound through lane, the northbound approach would be widened from two to three lanes and may require the acquisition of additional right-of-way. The receiving lanes on the north side of the intersection would also need to be widened, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040,* to extend the northbound right-turn lane from San Antonio Road to El Monte Avenue, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. Because the remainder of these improvements would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged, at QOS 4 (for both). The east-west bicycle and pedestrian crossing distances would increase slightly due to the additional through lane and continue to have right-turn slip lanes and high vehicle turning speeds, while maintaining the current QOS score.

  It is noted that the full Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #32 would implement the northbound widening, but while southbound widening would increase the available storage capacity, it would not be enough to reduce the Project's AM peak-hour impact to a less-than-significant level. Therefore, the southbound widening was not identified as a potential mitigation measure at this intersection.

- **Intersection #33: Contribute fair-share funding to the following improvements, at the signalized intersection of Foothill Expressway / Springer Road – Magdalena Avenue, as identified as a Tier 2 improvement in the draft Santa Clara County *Expressway Plan 2040*:**

  – Convert the signal to provide 8-phase phasing;

  – Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and

  – Change the lane configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.

  To accommodate an eight-phase signal, the eastbound and westbound left-turn movements would require designated left-turn lanes, and may require the acquisition of additional right-of-way. To accommodate the change to eastbound and westbound lane configurations, the center median on the west leg of the intersection would need to be shifted to incorporate a designated left-turn lane and remove one receiving lane from the west leg. The eastbound approach would require restriping to change the shared left-turn/through lane to a designated left-turn lane.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. To construct the designated eastbound left-turn lane, the eastbound lanes will be narrowed and the center median may be reduced, resulting in the same curb-to-curb width, but increasing the number of travel lanes. The proposed mitigation would not adversely affect the City of Los Alto's existing Class II bicycle facilities at the intersection.

  It is noted that the full Tier 2 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes converting to an eight-phase signal, operational/safety improvements at the County Club Drive intersection, and potentially adding a signal at the adjacent Berry Avenue intersection. The mitigation measure identified above for Intersection #33 would implement the eight-phase signal and associated lane configuration changes at the intersection.

- **Intersection #37: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Encinal Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

Implementation of this mitigation measure would reduce the contribution of the proposed Project to the significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.8 and QOS 2.7, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances on all approaches. While the bicycle StreetScore+ QOS on the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a designated right-turn lane. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) proposes Class II bike lanes on El Camino Real between Valparaiso Avenue and Alejandra Avenue, and the City of Menlo Park's *El Camino Real Corridor Study* (approved May 2016) proposes buffered Class II facilities (bicycle lanes) between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At Valparaiso Avenue, the northbound right-turn lane would allow for the conversion of a through/right-turn lane while maintaining the City's goal to provide bicycle lanes up to the Encinal Avenue intersection. The proposed mitigation measure could conflict with a Class II facility if only on-street parking is removed in order to add a third through lane. However, if the center median were narrowed, space for a bicycle lane could be provided. The existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers if the proposed mitigation measure is constructed. However, this is typical for bus stops on El Camino Real and other major arterials.

- **Intersection #38: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Valparaiso Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 4, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. While the bicycle StreetScore+ QOS on the northbound approach

would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a designated right-turn lane. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) proposes Class II bike lanes on El Camino Real between Valparaiso Avenue and Alejandra Avenue, and the City of Menlo Park's *El Camino Real Corridor Study* (approved May 2016) proposes buffered Class II facilities (bicycle lanes) between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). The proposed mitigation can be provided without precluding bicycle lanes on El Camino Real by using the center-median space on the north side of the intersection and modifying the buffered bicycle lane to a standard, non-buffered bike lane (Class II). On the south side of the intersection, the City's proposed design concept can be preserved by using the center-median space and modifying the shared right-turn/Class III facility to a shared through/right-turn lane and Class II facility to the right.

- **Intersection #41: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Ravenswood Road.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 (for both). The proposed mitigation would not alter the existing pedestrian crossing distances. While the bicycle StreetScore+ QOS at the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area and Right Turn On Red would be reduced because vehicles would no longer have a designated right- turn lane. The City of Menlo Park's *El Camino Real Corridor Study* (approved May 2016) proposes buffered Class II facilities (bicycle lanes) between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At the Ravenswood Avenue intersection, the northbound approach includes a left-turn lane, three through lanes, a bicycle lane, and a right-turn lane. This improvement is essentially consistent with the proposed mitigation and allows separate through and right-turn lanes. Thus, the proposed mitigation would not conflict with the City's planned Class II facility at this location.

- **Intersection #48: Contribute fair-share funding to the addition of a second northbound left-turn lane, at the signalized intersection of El Camino Real / Embarcadero Road.**

  To accommodate the construction of a second northbound left-turn lane, the northbound approach would be widened from four to five lanes by potentially reducing the lane widths, reducing the width of the center median, and/or removing on-street parking for the length of the additional left-turn pocket and taper. Addition right-of-way may be required to accommodate the second northbound left-turn lane.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.8 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, but would add an additional travel lane on the south leg of the intersection, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*. It should be noted that the City of Palo Alto is currently designing bicycle improvements at this intersection.

  The VTA El Camino Real Bus Rapid Transit (BRT) Project would upgrade Rapid Bus Route 522 to have BRT status. The geometric alternatives included in the draft Environmental Impact Report for the BRT Project do not include a separate bus lane through this intersection. Some alternatives studied include the creation of outboard bus lanes through the removal of parking on the south side of El Camino Real. Because there is no final design for this intersection, and the BRT project completion date is uncertain, it is not possible to determine what, if any, effect this mitigation measure would have on the BRT Project. However, the existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers; this typical for bus stops on El Camino Real and other major arterials.

- **Intersection #56: Contribute fair-share funding to the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, at the signalized intersection of Alma Street / Hamilton Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the north side of Hamilton Avenue.

  Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. However,

because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.5 and QOS 2, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*.

- **Intersection #58: Implement the same mitigation identified for this intersection under 2018 Baseline with Project conditions, which stipulates contribution of fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would improve the level of service, and the impact would be reduced, but not to a less-than-significant level. Therefore, the contribution of the proposed Project to this impact would remain considerable, and the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection, and remain unchanged on all other approaches, while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on the northbound and southbound approaches. The proposed mitigation measure for Intersection #58 would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

- **Intersection #59: Contribute fair-share funding to the addition of a second westbound left-turn lane and a second receiving lane on the south leg, at the signalized intersection of Middlefield Road / Marsh Road.**

  The construction of a second westbound left-turn lane and a second receiving lane would require the acquisition of additional right-of-way. This mitigation measure is consistent with recommendations in the *ConnectMenlo Final EIR,* the *Middle Plaza at*

500 El Camino Real Draft EIR, the *Menlo Park Facebook Campus Expansion Project FEIR* and the *Menlo Gateway Final EIR*. The Town of Atherton has preliminary plans to redesign the intersection.

Implementation of this mitigation measure would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Town of Atherton, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The proposed mitigation would cause the bicycle StreetScore+ QOS to worsen from QOS 2.7 to QOS 3; the pedestrian StreetScore+ QOS would remain unchanged at QOS 3. With the proposed mitigation, a second receiving lane would be added on the southbound approach, causing an uncomfortable situation where bicyclists travel along a four-lane roadway compared to a three-lane roadway existing today. Missing sidewalks and curb ramps cause uncomfortable situations for pedestrians at all intersection crossings.

- **Intersection #89: Close Castro Street at the train tracks to form a T-intersection of Central Expressway / Moffett Boulevard, consistent with recommendations in the May 2017 *Mountain View Transit Center Master Plan*.**

  The City of Mountain View has approved plans to close Castro Street (the west leg) at the train tracks, which would change the current four-leg intersection to a T-intersection of Central Expressway and Moffett Boulevard. This improvement would not require any additional right-of-way if implemented by the City of Mountain View. Given that this is the City's preferred improvement and would reduce the contribution of the proposed Project to this significant cumulative impact to a less-than-considerable level, the closure of Castro Street is the identified mitigation measure at this intersection.

  It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*, which would grade-separate the train tracks from the intersection, increasing the available capacity at the intersection and reducing the Project's impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that the proposed Project's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The proposed mitigation is anticipated to improve bicycle and pedestrian QOS; the bicycle QOS would shift from 3.3 to 1.7, and the pedestrian QOS would shift from 4 to 2. With the closure of Castro Street, pedestrian and bicycle crossings will be moved to a separated underground facility to cross Central Expressway and the Caltrain tracks with the exception of the east leg of the intersection where pedestrian crossings would still occur at-grade. Northbound and southbound bicyclists would continue to travel on Central Expressway, but bicyclists traveling from Moffett Boulevard to Castro Street would use the underground crossing.

***Intersection #89 Alternative Mitigation*:** If the closure of Castro Street is not implemented in a timely manner and/or the City of Mountain View does not pursue the improvement, the following alternative (back-up) mitigation measure is proposed, which would reduce the contribution of the proposed Project to this significant cumulative impact to a less than considerable level:

> *Intersection #89 Alternative Mitigation Measure*: Contribute fair-share funding to the construction of a second southbound left-turn lane from Central Expressway to Moffett Boulevard.

To accommodate the construction of a second southbound left-turn lane, the Central Expressway center median would need to be reduced and/or removed; the improvement would not require any additional right-of-way. Given the existing and proposed geometry, signal timings may also need to be modified to provide lead-lag left turns (to account for potential truck turn conflicts). With this mitigation, the contribution of the proposed Project to the significant cumulative impact would be reduced to a less-than-considerable level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the significant cumulative impact is mitigated. In that case, the impact would remain significant and unavoidable.

Stanford will contribute its fair-share funding toward the second southbound left-turn lane from Central Expressway to Moffett Boulevard. The funding can be used for the Castro Street closure project.

Remaining Intersections: Due to physical constraints, no feasible mitigation measures have been identified at the following intersections, and the contribution of the proposed Project to significant cumulative impacts would remain considerable, and the cumulative impacts would remain significant and unavoidable:

21. Middlefield Road / Oregon Expressway – the constraint is the proximity of the Oregon Avenue frontage road and the County's desire to preserve the shoulder striping along Oregon Expressway for use by bicyclists.

29. Foothill Expressway / Hillview Avenue – the constraint is the proximity of the Miranda Avenue / Hillview Avenue intersection and lack of improvement identified in the draft Santa Clara County Expressway Plan 2040.

63. Middlefield Road / Lytton Avenue – the constraint is the proximity of the residential units near the intersection.

66. Middlefield Road / Embarcadero Road – the constraint is the proximity of the residential units near the intersection.

90. Foothill Expressway / Edith Avenue – the constraint is the proximity of the residential units and retail space near the intersection.

See **Table 5.15-31** for mitigated LOS conditions.

TABLE 5.15-31
2035 CUMULATIVE WITH PROJECT INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Project		Mitigation Measure	2035 Cumulative With Project (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**155.2** 18.6	**F** B-	See MM 5.15-2(a) (Table 1)	**68.1** 15.7	**E** B	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**186.9** **175.2**	**F** **F**	See MM 5.15-2(a) (Table 1)	**147.8** **162.5**	**F** **F**	LTS/SU
19	Hanover Street / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**92.1** 52.8	**F** D-	See MM 5.15-2(a) (Table 1)	73.7 50.3	E D	LTS/SU
20	El Camino Real / Page Mill Road – Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**84.9** **90.2**	**F** **F**	See MM 5.15-2(a) (Table 1)	69.7 **82.4**	E **F**	LTS/SU
21	Middlefield Road / Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.6** **103.6**	**F** **F**	N/A (no feasible improvements)			SU
29	Foothill Expressway / Hillview Avenue	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**135.0** 64.2	**F** E	N/A (no feasible improvements)			SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**201.2** **208.9**	**F** **F**	See MM 5.15-2(a) (Table 1)	41.9 70.7	D E	LTS/SU
31	Foothill Expressway / San Antonio Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	43.2 **171.0**	D **F**	See MM 5.15-2(a) (Table 1)	43.2 46.4	D D	LTS/SU
32	Foothill Expressway / El Monte Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**149.3** **137.9**	**F** **F**	See MM 5.15-2(a) (Table 1)	75.0 **113.9**	E **F**	LTS/SU
33	Foothill Expressway / Springer Road – Magdalena Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.9** **154.4**	**F** **F**	See MM 5.15-2(a) (Table 1)	**122.9** **147.7**	**F** **F**	LTS/SU
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.4 **92.9**	D **F**	See MM 5.15-2(a) (Table 1)	35.5 67.2	D+ E	LTS/SU
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 **57.4**	D- **E+**	See MM 5.15-2(a) (Table 1)	52.5 52.3	D- D-	LTS/SU
41	El Camino Real / Ravenswood Road	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.7 **65.8**	D **E**	See MM 5.15-2(a) (Table 1)	47.6 **63.7**	D **E**	LTS/SU

TABLE 5.15-31 (CONTINUED)
2035 CUMULATIVE WITH PROJECT INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Project		Mitigation Measure	2035 Cumulative With Project (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	60.4 **82.2**	E **F**	See MM 5.15-2(a) (Table 1)	53.0 71.7	D- E	LTS/SU
56	Alma Street / Hamilton Avenue	Palo Alto	LOS D	AM PM	10.2 **57.7**	B+ **E+**	10.4 **60.0**	B+ **E**	See MM 5.15-2(a) (Table 1)	10.0 39.3	B+ D	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	**123.4** **121.5**	**F** **F**	**127.3** **126.7**	**F** **F**	See MM 5.15-2(a) (Table 1)	**120.5** **123.2**	**F** **F**	SU
59	Middlefield Road / Marsh Road	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.7** **77.4**	**E-** **E-**	See MM 5.15-2(a) (Table 1)	41.7 68.6	D E	LTS/SU
63	Middlefield Road / Lytton Avenue	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.1 **70.1**	D- **E**	N/A (no feasible improvements)			SU
66	Middlefield Road / Embarcadero Road	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**59.4** **72.9**	**E+** **E**	N/A (no feasible improvements)			SU
89	Central Expwy / Castro St-Moffett Blvd	Santa Clara Co. (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**243.7** **225.7**	**F** **F**	See MM 5.15-2(a) (Table 1)	85.2 94.0	F F	LTS/SU
90	Foothill Expressway / Edith Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	55.9 **105.5**	E+ **F**	61.5 **112.6**	E **F**	N/A (no feasible improvements)			SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection;
SU = significant and unavoidable.

SOURCE: Fehr & Peers, September 2018.

Impact 5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions. (*Significant*)

Freeway Segments

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Freeway segments with significant Project impacts under 2035 Cumulative with Project conditions are:

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour);
- Northbound I- 280
  - Wolfe Road to De Anza Boulevard (AM peak hour);
  - SR 85 to Foothill Expressway (AM and PM peak hours);
  - Foothill Expressway to Magdalena Avenue (AM peak hour);
  - Sand Hill Road to Woodside Road (PM peak hour);
- Southbound I-280
  - Sheep Camp Trail to Edgewood Road (AM peak hour);
  - Woodside Road to Sand Hill Road (AM peak hour);
  - Magdalena Avenue to Foothill Expressway (PM peak hour);
  - Foothill Expressway to SR 85 (PM peak hour);
  - State Route 85 to De Anza Boulevard (PM peak hour);
  - De Anza Boulevard to Wolfe Road (PM peak hour).

There are limited options to widen these freeway segments due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. For these reasons, the contribution of the proposed Project to significant cumulative freeway impacts would remain considerable, and the impacts would remain significant and unavoidable. Mitigation Mitigation Measure 5.15-2(a) would reduce the Project's contribution to significant cumulative impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fair share fees paid by Stanford for exceeding the No Net New Commute Trips standard to fund transportation mitigation efforts. Nevertheless, because it is uncertain whether implementation of the improvements would occur, the proposed Project's freeway impacts would remain significant and unavoidable.

Freeway Ramps

A freeway ramp analysis was conducted to assess increases in peak period ramp queue lengths with the addition of Project traffic and the effects of those increased queues on freeway and local street operations. Ramp queuing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions. Thus, the results presented here are provided for information purposes only.

Freeway On-Ramps

As described above, there are freeway on-ramps equipped with ramp meters within the study area. Caltrans operates dynamic ramp metering rates based on queues on the freeways and on the ramps. Therefore, the on-ramp queues were evaluated at the minimum and maximum ramp metering rates to show the potential range of queues at the given ramp. As shown in **Table 5.15-32**, all queues would remain within the available storage when the ramp metering rate operates at the maximum (900 vphpl) rate under 2035 Cumulative and 2035 Cumulative with Project conditions. All queues would exceed the available storage when using the minimum ramp metering rate, although it is unlikely that the metering rate remains at the minimum rate, given the above-stated ability for the rate to change. **Table 5.15-33** shows the other (non-metered) on-ramps that provide access to Stanford.

Freeway Off-Ramps

Off-ramp queues that terminate at an intersection were evaluated using ramp-terminal intersection queue estimates from the intersection LOS calculations. Slip ramps where there is no control device (e.g., no signal or stop sign) and the ramp merges with the local street were evaluated using V/C ratios.

As shown in **Table 5.15-34**, all off-ramps would accommodate vehicle queues within the available ramp storage, with the exception of the I-280 / Sand Hill Road northbound off-ramp, on which excessive queues would result in a queue spillback onto the freeway mainline of 940 feet and 1,030 feet without and with the proposed Project, respectively. Additionally, the following queues would exceed the available turn-pocket storage queue:

- US 101 / University Avenue southbound loop off-ramp – right-turn queue would exceed pocket storage length during the AM and PM peak periods, without and with the Project
- I-280 / Sand Hill Road northbound diagonal off-ramp – right-turn queue would exceed pocket storage length during the AM and PM peak periods, without and with the Project
- I-280 / Page Mill Road northbound diagonal off-ramp – left-turn queue would exceed pocket storage length during the AM and PM peak period, without and with the proposed Project

While these turn queues would exceed the available turn pocket storage, the queues would still be served within the total ramp storage, and would not spillback into the freeway mainline.

TABLE 5.15-32
2035 FREEWAY METERED ON-RAMP QUEUING EVALUATION
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	2035 Cumulative No Project		2035 Cumulative with Project	
			Ramp Volume	Min. / Max. Queue (feet)[c]	Ramp Volume	Min. / Max. Queue (feet)[c]
Oregon Expressway (US 101 Southbound)	1,400	AM PM	1,304 1,416	30 / **18,300** 30 / **77,610**	1,310 1,429	30 / **18,390** 30 / **78,870**
Embarcadero Road (US 101 Southbound)	1,150	AM PM	813 726	30 / **18,450** 750 / **24,120**	829 758	30 / **19,290** 1,080 / **27,270**

Bold text indicates conditions where the queue exceeds the available storage capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] Minimum queues estimated using the maximum metering rates provided by Caltrans. Maximum queues estimated using the minimum metering rates provided by Caltrans. The minimum queue is one vehicle, which is equal to 30 feet.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

TABLE 5.15-33
2035 FREEWAY NON-METERED ON-RAMP VOLUMES AND STORAGE CAPACITY
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)

On-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	Cumulative (2035) No Project Volume	Cumulative (2035) with Project Volume
US 101 Northbound On-Ramps				
Willow Road	650	AM PM	411 352	413 358
University Avenue	880	AM PM	391 121	393 125
I-280 Northbound On-Ramps				
Sand Hill Road	1,460	AM PM	648 1,526	692 1,627
Alpine Road	1,000	AM PM	360 710	360 710
Page Mill Road	700	AM PM	863 1,395	866 1,401
I-280 Southbound On-Ramps				
Page Mill Road	1,500	AM PM	706 1,189	750 1,278
Alpine Road	650	AM PM	386 591	402 620
Sand Hill Road	800	AM PM	330 1,130	338 1,141

Bold text indicates conditions where the queue exceeds the available storage capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.

SOURCE: Caltrans, April 2017; and Fehr & Peers, September 2018.

TABLE 5.15-34
2035 FREEWAY OFF-RAMP QUEUING EVALUATION
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT):
SIGNALIZED AND STOP-CONTROLLED TERMINAL INTERSECTIONS

Off-Ramp	Storage Capacity (feet)[a]	Peak Period[b]	Cumulative (2035) No Project		Cumulative (2035) with Project	
			Ramp Volume[c]	Queue (feet)[d]	Ramp Volume[c]	Queue (feet)[d]
US 101 Southbound Off-Ramps						
Willow Road	1,025/1,025	AM PM	160 / 432 470 / 401	150 / 510 480 / 420	160 / 440 470 / 404	150 / 510 480 / 420
University Avenue	1,870 / 190	AM PM	262 / 250 190 / 590	540 / **510** 300 / **690**	267 / 250 193 / 590	540 / **510** 300 / **720**
I-280 Northbound Off-Ramps						
Sand Hill Road	740 / 300	AM PM	100 / 630 50 / 230	90 / **1,680** 90 / **450**	100 / 633 50 / 235	120 / **1,770** 90 / **450**
Alpine Road[f]	1,360 / 280	AM PM	250 / 851 130 / 269	40 / [e] 30 / [e]	250 / 880 130 / 291	40 / [e] 30 / [e]
Page Mill Road	60 / 1,830	AM PM	250 / 1,719 120 / 242	**600** / [e] **390** / [e]	250 / 1,806 120 / 307	**600** / [e] **390** / [e]
I-280 Southbound Off-Ramps						
Alpine Road	1,370 / 450	AM PM	390 / 550 160 / 320	250 / [e] 60 / [e]	390 / 550 160 / 320	250 / [e] 60 / [e]
Page Mill Road[f]	150 / 1,940	AM PM	1,612 / 50 1,116 / 50	**1,260** / [e] **1,080** / [e]	1,615 / 50 1,123 / 50	**1,290** / [e] **1,110** / [e]

Bold text indicates conditions where the queue exceeds the turn pocket capacity.

[a] Vehicle storage capacity is defined as the length of the longest mixed-flow lane available for vehicle queuing. Length is measured from gore point to gore point or where any queue spillback has the potential to block other movements. Storage Capacity for a Controlled Ramp - ##/## = left-turn and (or) through pocket / right-turn pocket
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] Ramp volume by turning movement - ##/## = left-turn and (or) through movement / right-turn movement
[d] The queue indicated represents the 95th Percentile Queue for signalized movements and the Average Queue for stop- controlled movements - ##/## = left-turn and (or) through queue / right-turn queue
[e] Only left-turn movement is stop-controlled. Free right-turn queues are not provided.
[f] For all-way stop-controlled ramp intersections, the average queue is reported due to the limitations of the *2000 HCM*.

SOURCE: Fehr & Peers, September 2018.

As shown in **Table 5.15-35**, most of the V/C ratios (for Cumulative (2035) Conditions without and with the Project) for the off-ramps with uncontrolled terminal intersections for the AM and PM peak periods would be less than 1.00, indicating that the off-ramps have sufficient capacity to accommodate the exiting volumes at these locations, except at I-280 / Sand Hill Road southbound off-ramp (No Project V/C is 1.03, with Project V/C would be 1.10, in the AM peak period).

Mitigation Measure: Implement Mitigation Measure 5.15-2(a).

Significance after Mitigation: Significant and Unavoidable.

TABLE 5.15-35
2035 FREEWAY OFF-RAMP QUEUING EVALUATION
(2035 CUMULATIVE AND 2035 CUMULATIVE WITH PROJECT)
(UNCONTROLLED TERMINAL INTERSECTIONS)

Off-Ramp	Maximum Vehicle Flow Rate (Capacity, vphpl)[a]	Peak Period[b]	2035 Cumulative		2035 Cumulative with Project	
			Ramp Volume	Volume-to-Capacity Ratio	Ramp Volume	Volume-to-Capacity Ratio
US 101 Northbound Off-Ramps						
Embarcadero Road (loop)	1,800	AM PM	714 601	0.41 0.33	778 621	0.43 0.35
I-280 Northbound Off-Ramps						
Alpine Road (diagonal)[c]	1,900	AM PM	851 269	0.45 0.14	880 291	0.46 0.15
Page Mill Road (diagonal)[c]	1,900	AM PM	1,719 242	0.90 0.13	1,806 307	0.95 0.16
I-280 Southbound Off-Ramps						
Sand Hill Road (loop)	1,800	AM PM	1,860 720	**1.03** 0.40	1,974 780	**1.10** 0.43
Alpine Road (diagonal)[c]	1,900	AM PM	550 320	0.29 0.17	550 320	0.29 0.17
Page Mill Road (diagonal)[c]	1,900	AM PM	50 50	0.03 0.03	50 50	0.03 0.03

Bold text indicates the off-ramp does not have sufficient capacity to accommodate the exiting volumes.

[a] Diagonal ramps were assumed to have a capacity of 1,900 vehicles per hour per lane (vphpl). Loop ramps were assumed to have a capacity of 1,800 vphpl.
[b] AM peak period – 6:00 AM to 9:00 AM. PM peak period – 3:00 PM to 7:00 PM.
[c] The right-turn movement is uncontrolled. Therefore, the right-turn volume and V/C is the only ramp movement reported in the table.

SOURCE: Fehr & Peers, September 2018.

As stated above, there are limited options to widen these freeway segments due to right-of-way constraints, and mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 5.15-2(a) would reduce cumulative impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fair share fees paid by Stanford from exceeding the No Net New Commute Trips standard to alternative programs that reduce vehicular trips. Nevertheless, because it is uncertain whether implementation of the improvements would occur, the Project's contribution to cumulative freeway impacts would remain significant and unavoidable.

Impact 5.15-11: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future, projects, would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. The proposed 2018 General Use Permit does not propose infrastructure changes outside the Project site and, thus, would not interfere with the ability of transit agencies to modify or expand service. Therefore, the proposed Project's impact on transit services would be less than significant. The Project would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 5.15-36**, the Project would not add substantial delays relative to the total route travel time to any of the transit routes assessed.

TABLE 5.15-36
2035 CUMULATIVE WITH PROJECT TRANSIT ROUTE DELAYS

Route		Direction	Peak Hour	Increased Average Delay with Project (seconds)
VTA 22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM PM	12.2 35.8
		Westbound	AM PM	20.9 17.4
VTA 35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM PM	11.8 22.0
		Southbound	AM PM	16.7 13.2
VTA 89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM PM	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0
VTA 102	South San Jose to Palo Alto	Northbound	AM	< 5.0
		Southbound	PM	16.7
VTA 104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0
		Westbound	AM	26.3
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM PM	9.1 34.1
		Westbound	AM PM	20.9 17.4
SamTrans 281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM PM	6.5 9.6
		Westbound	AM PM	< 5.0 < 5.0
SamTrans ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM PM	< 5.0 10.0
		Southbound	AM PM	< 5.0 < 5.0

TABLE 5.15-36 (CONTINUED)
2035 CUMULATIVE WITH PROJECT TRANSIT ROUTE DELAYS

Route		Direction	Peak Hour	Increased Average Delay with Project (seconds)
AC Transit DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM PM	< 5.0 7.4
		Westbound	AM PM	22.6 9.2
AC Transit DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM PM	<5.0 8.6
		Westbound	AM PM	31.1 26.2
AC Transit U	Fremont BART to Stanford Oval	Eastbound	PM	29.4
		Westbound	AM	17.0
Palo Alto Shuttle E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM PM	5.9 14.2
		Westbound	AM PM	11.8 < 5.0
Palo Alto Shuttle C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM PM	< 5.0 8.98
		Westbound	AM PM	29.1 6.3

SOURCE: Fehr & Peers, September 2018.

The additional delay would be fewer than 30 seconds on all but two of the routes. The VTA Route 22 would experience a longer delay change, at 36.5 seconds (eastbound direction in the PM peak hour only), and VTA Route 522 would experience a longer delay change, at 34.8 seconds (eastbound direction in the PM peak hour only). This is a less than significant impact.

Mitigation: None required.

5.15.6 Vehicle Miles Traveled Impacts

As explained above (5.15.1 *Introduction – Legal Requirements in Transition*), California has enacted a law (SB 743) that will phase out the traditional Transportation Impact Assessment as the approach used in documents prepared to comply with CEQA, and replace that methodology with an analysis of Vehicle Miles Traveled. A VMT Analysis evaluates vehicle trips made throughout the day, and focuses on the number and length of vehicle trips made by project employees and residents. Measures to reduce VMT include locating a project near major transit stops and high-quality transit corridors, improving bicycle and pedestrian facilities, and instituting programs to encourage travel by modes other than driving alone. Rather than increasing road capacity, a VMT analysis focuses on getting people out of their cars.

The County has not yet removed its congestion-based level of service criteria, and the traditional congestion-based approach to evaluating traffic impacts is still needed. However, the VMT

approach outlined in this Program EIR will most likely be required by the State law beginning at some point in time during the horizon of the 2018 General Use Permit. The VMT analysis has been included in this Program EIR to more fully describe the proposed Project's impacts and to facilitate the County's continued use of this Program EIR when it reviews and evaluates individual projects implementing or modifying the 2018 General Use Permit. As of the date of the publication of this Draft EIR, OPR's VMT guidelines are still in draft form. Consequently, the County has not adopted a threshold or established a standard methodology for evaluating VMT. The proposed 2018 General Use Permit represents a unique and distinct set of circumstances compared to other development applications presented to the County and located in predominately rural unincorporated areas of the County because the proposed development that would occur on Stanford lands is predominantly in-fill in nature, inclusive of mixed uses (housing and academic space), and would be located near transit systems. Therefore, the approach used in the following impact discussion would not be applicable to a VMT evaluation of other development applications under consideration by the County.

The following discussion evaluates the VMT characteristics of the proposed 2018 General Use Permit and is a based on the information from the Vehicle Miles Traveled (VMT) Analysis (see Appendix VMT). The evaluation reflects the stated intent of SB 743 and is informed by the draft proposals developed by the State Office of Planning and Research (OPR) for performing SB 743 assessments in CEQA documents.

Significance Criteria

In its November 2017 *Proposed Changes to the CEQA Guidelines*, OPR proposed criteria for analyzing transportation impacts of land use projects. On July 2, 2018, modifications to the proposed amendments to the CEQA Guidelines were released.[8A] The following reflects these revisions:

Proposed New Section 15064.3. Determining the Significance of Transportation Impacts.

(a) Purpose.

This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of a project's transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding highway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact.

[8A] Attachment A (Proposed 15-day Modifications) to the California Natural Resources Agency Notice of Public Availability of Modifications to Text of Proposed Regulation and Addendum to the Initial Statement of Reasons and Informative Digest (July 2, 2018).

> *(b) Criteria for Analyzing Transportation Impacts.*
>
> *Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less-than-significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.*

Other than the two presumptions listed in proposed CEQA Guidelines section 15064.3(b)(1), OPR does not propose to establish numeric significance criteria through the CEQA Guidelines. OPR's April 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA* provides numeric thresholds that an agency could choose to use when assessing the significance of a project's additional vehicle miles traveled in the event that the presumptions in proposed CEQA Guidelines section 15064.3(b)(1) do not apply.

Based on OPR's November 2017 *Proposed Changes to the CEQA Guidelines,* the July 2018 modifications to the proposed amendments to the CEQA Guidelines, and OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA*, the following significance criteria were used to assess VMT for the proposed 2018 General Use Permit:

1. Is the project within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor? If so, the project is presumed to result in a less-than-significant impact on VMT.
2. Alternatively, the proposed Project is considered to result in a significant impact to VMT if project-related VMT would exceed the following numeric thresholds:
    - Residential Per Capita Daily VMT: A project exceeding existing regional household daily VMT per capita minus 15 percent.
    - Worker Per Capita Daily VMT: A project exceeding a level of 15 percent below existing regional daily VMT per worker.

Approach to Analysis

OPR's draft *Technical Advisory* suggests that lead agencies can evaluate each component of a mixed-use project independently, and apply the significance threshold for each project type included in the mixed-use project. The analysis of each use may reflect credit for internal capture of trips within the project. Based on this guidance, residential and worker VMT for the proposed 2018 General Use Permit were assessed independently, and the project-specific data used in the evaluation account for internal capture.

Populations Included in the Analysis

Stanford anticipates that the 2018 General Use Permit will continue to cover all of its lands in unincorporated Santa Clara County. However, the General Use Permit does not apply to land uses within those areas that are permitted as of right (e.g., the single-family and two-family residences in

the faculty/staff subdivision), and therefore are not included in this VMT analysis. In addition, Stanford does not propose development under the 2018 General Use Permit in two areas zoned for medium-density faculty and staff housing (the Peter Coutts housing area and the Olmsted Terrace housing area). Nor does Stanford propose development outside the Academic Growth Boundary, including on the Stanford Golf Course. Therefore, these areas are not included in the VMT analysis.

The daily VMT analysis includes all of the Academic Campus and Campus Open Space lands, including the Stanford Driving Range, which Stanford proposes to designate as Academic Campus rather than medium-density residential. Thirty-eight existing faculty/staff housing units are included in the study area for the 2018 GUP. These units are located in the Searsville and Olmsted staff rental subdivision and were included in the daily VMT analysis.

Benchmarks Included in the Analysis

Based on the OPR guidance described above, the numeric benchmarks against which the proposed 2018 General Use Permit worker and resident VMT were compared are:

- the Bay Area regional daily average home-based-work VMT per worker; and
- the Bay Area regional daily average home-based VMT per capita.
- The VTA transportation model is a trip-based model developed and validated for the estimation of trips made for home-based work, home-based non-work and non-home based trips. OPR's draft *Technical Advisory* states that home-based trips can be the focus for analysis of residential projects, and home-based-work trips can be the focus of the analysis for office projects. Therefore, the VTA model is a reliable source to establish the Bay Area and Santa Clara County average daily VMT per worker and per capita at an aggregate level.

OPR's draft *Technical Advisory* recommends setting thresholds of significance at 15 percent below the regional benchmark for average daily VMT per worker[9] or per capita. Taking all of these recommendations into account, **Table 5.15-37** indicates the VMT generation thresholds to be applied to the proposed 2018 General Use Permit.[10]

9 OPR's draft Technical Advisory does not address travel by college students. The omission of VMT from students traveling to and from the campus would leave a large gap in the VMT picture for Stanford; therefore, student trips are included in the assessment of Worker VMT. While student travel behavior is similar to that of faculty and staff, a sensitivity analysis was prepared for Worker VMT that did not include the student travel. This analysis was prepared to document that inclusion of the students did not overly influence or obscure the level of VMT per worker generated by the faculty and staff alone.

10 In addition to numeric comparisons to regional benchmarks. OPR presents a third approach that can be used to assess the significance of VMT -- evaluation of the change in total VMT caused by the project. OPR states the third method is useful when a project is likely to divert or substitute trips. This method was considered for evaluation of trips by visitors to the Stanford campus; however, it was determined that the method does not appear to be well-suited to the specifics of the proposed 2018 General Use Permit. OPR has not provided guidance as to how an agency should assess significance using this method if the relevant visitor trips are not of the type that would be redistributed from one location to another.

TABLE 5.15-37
APPLICABLE BENCHMARKS AND NUMERIC SIGNIFICANCE THRESHOLDS

Traveler and Trip Type	Daily VMT per Capita	
	Benchmark (region-wide average)	Numeric Threshold of Significance (85% of benchmark)
Worker Home-Based-Work Daily VMT per Worker	16.18	13.75
Resident Home-Based Daily VMT per Capita	17.33	14.73

SOURCE: Fehr & Peers, 2017

Methodology for Calculating 2018 General Use Permit VMT

This VMT analysis uses the VTA model to establish the regional benchmarks for average daily home-based work trips per worker and all average daily home-based trips per resident (home-based-work and home-based-other trips) The Stanford-specific analysis uses the same categories of inputs and approach as the VTA model for calculating these same trip types; however, for improved accuracy in calculating Stanford-specific VMT, trip generation rates, trip origins and destinations, and trip lengths (for home-based work and home-based other trips) directly measured and monitored by Stanford and peer reviewed by Santa Clara County were used. The Stanford home-to-work trips were adjusted to be consistent with the VTA VMT calculation by using the VTA model's assumption regarding the percentage of work trips that travel directly from home to work. When Stanford-specific data was available, it was used in the project-specific model including trip rates, travel modes, and trip length. When Stanford-specific data was not available, the assumptions were based on values from the VTA model or California Household Transportation Survey (CHTS), which is a source used by the VTA.

Campus Population

An understanding of the campus population is relevant both to developing an inventory of contributors to worker and resident VMT, and determining the total numbers of workers and residents to use as the denominators in arriving at daily VMT per capita. The worker VMT calculations include students, faculty, staff, contractors and other onsite workers. The resident VMT calculations include students, faculty, staff, and other household members living on campus within the study area.

Stanford proposes to increase the amount of on-campus housing for students and faculty/staff. The change to where students, faculty and staff live is reflected in the VMT calculation methodology for workers and residents. Compared to 2018, by Fall 2020, Stanford will add another 2,020 student beds as part of the EV Graduate Residences project approved under the 2000 General Use Permit. The addition of these beds will reduce Stanford's off-campus student population, which will reduce worker VMT because moving off campus students to campus eliminates home-based work vehicle trips (on-campus students commute to class by bike or walking. Once the proposed 2018 General Use Permit is fully implemented, Stanford estimates there would be an additional 1,700 undergraduate beds, 900 graduate beds, and 550 faculty/staff dwelling units.

General Methodology for Counting VMT

Based on the data available to conduct this analysis and the methodologies of the VTA travel model, a trip-based assessment for both the worker and resident populations at Stanford was completed. OPR states in its draft *Technical Advisory* that where a trip-based approach is used for residential and office projects, "home based trips can be the focus for analysis of residential projects; home-based work trips can be the focus of the analysis for office projects."

To perform the analysis, data collected by Stanford Parking & Transportation Services (P&TS) in its annual transportation survey was relied upon. The annual survey includes all university faculty and staff, undergraduate and graduate students, post-doctoral students, and affiliates of Stanford. The survey collects a wide range of travel characteristics including key data on mode of travel, time of travel, and frequency - days per week on campus.

These surveyed travel characteristics, along with data for Santa Clara County from the California Household Travel Survey (CHTS) and the VTA travel demand model, were used to calculate the VMT for campus workers and residents.

Worker Analysis

Worker VMT is focused on trips that start at home and end at work, or start at work and end at home. Trips with an intermediate stop between home and work, such as the grocery store or cleaners, are not included in the calculation of Worker VMT, nor in the regional and countywide benchmarks to which they are compared.

Based on available site-specific data, data from the CHTS, and assumptions from the VTA model, the home-based work trips for those Stanford workers who travel directly between their residences and their work sites within the study area were determined, including trips from the Stanford campus to other destinations and internal to the Stanford campus during the workday. The Worker VMT calculation was based on the worker population on the campus, their place of residence, and their travel behavior (mode choice and vehicle occupancy) on their daily commute.

Resident Analysis

Resident VMT includes all trips that originate at the home, including trips related to work, shopping, recreation, or school. Many of home-based trips are relatively short, but there is a larger number of trip types included in the Resident VMT as compared to the Worker VMT.

Based on available site-specific data, data from the CHTS, and assumptions from the VTA model, the home-based trips for Stanford residents (students, faculty, staff and family members) were calculated. The VMT per campus resident was determined based on the sum of all home-based trips, including both home-based trips to and from work (home-based work trips) and home-based trips to and from other destinations (home-based other trips).

For household members who are Stanford workers (faculty, staff and students), site-specific assumptions were made regarding the frequency, length, and mode of home-based work trips as described above. For other home-based work trips by other household members and for home-based other trips for all residents, default assumptions were used from the CHTS and the VTA model.

Because Resident VMT includes all trip types, including work commutes, shopping, recreation and school, Resident VMT on a per capita basis may be larger than Worker VMT per capita. In addition, daily VMT per worker at Stanford is low due to Stanford's TDM program that provides incentives that reduce the number of drive-alone commuters. By contrast, Resident daily VMT per capita at Stanford is largely calculated based average defaults from the CHTS given that little information is available with regard to non-Stanford employee household members' trips and home-based other trips.

Fall 2015 Campus VMT Generation

The worker population within the study area in Fall 2015 was approximately 38,850 people, and the total resident population was approximately 12,590 people. The weekday vehicle trip generation per capita (for residents) and per worker are indicated in **Table 5.15-38**. As a sensitivity test, worker VMT excluding students has been provided.

TABLE 5.15-38
FALL 2015 TYPICAL WEEKDAY VMT

Traveler	Trip Purposes	Population	VMT	VMT per Capita
Workers (Including Students)	HBW	38,851	181,196	4.66
Workers (Excluding Students)	HBW	22,661	163,631	7.22
Study Area Residents	HBW + HBO	12,592	116,748	9.24

SOURCE: Fehr & Peers, 2017

Fall 2018 Campus VMT Generation

Continued growth under the 2000 General Use Permit is anticipated until 2018. In Fall 2018, the General Use Permit study area is anticipated to have a worker population of approximately 40,240 people and a resident population of approximately 13,030 people. The estimated daily VMT per capita for workers and residents is shown in **Table 5.15-39**. Similar to the 2015 analysis, worker VMT excluding students has been provided as a sensitivity analysis.

TABLE 5.15-39
FALL 2018 TYPICAL WEEKDAY VMT

Traveler	Trip Purposes	Population	VMT	VMT per Capita
Workers (Including Students)	HBW	40,240	186,739	4.64
Workers (Excluding Students)	HBW	23,627	169,326	7.17
Residents	HBW + HBO	13,028	121,192	9.27

SOURCE: Fehr & Peers, 2017

Between Fall 2015 and Fall 2018 daily VMT per worker will be reduced. The reasons for the reduction in the daily VMT per worker are that the University Terrace housing development, located in Palo Alto adjacent to the campus, will add 180 faculty housing units. Due to the proximity to campus, a substantial portion of these workers will choose to use alternative modes of travel (bike, walk, or use Marguerite) to campus. For those that do choose to drive to campus their average trip length would be reduced from over 11 miles to less than 2 miles. During this same time period Stanford plans to add 416 student beds to the campus, while increasing enrollment by only 423 undergraduate and graduate students.

Daily VMT per capita for residents will increase slightly between Fall 2015 and 2018, but will remain at a level that is well below regional averages. Stanford will have added a similar number of undergraduate student beds (216) and graduate student beds (200). The increase in resident daily VMT per capita is due to the fact that graduate student housing generates higher VMT per capita than undergraduate student housing.

Fall 2020 Campus VMT Generation (with Escondido Village Graduate Residences)

Stanford has received approval to construct a new housing complex in Escondido Village, which is expected to be completed in 2020 (shifting students from off-campus to on-campus housing); the additional beds will increase the Stanford residential population, which will add home-based trips. Adding these student beds will reduce the number of graduate students currently living off-campus and commuting to the campus, which will reduce the student commute VMT. This 2020 analysis assumes the same number of workers as the 2018 analysis. In Fall 2020, the study area is expected to have a resident population of approximately 15,250 people. The estimated daily VMT per capita for workers and residents is shown in **Table 5.15-40**. Similar to the 2015 analysis, Worker VMT excluding students has been provided as a sensitivity analysis.

TABLE 5.15-40
FALL 2020 TYPICAL WEEKDAY VMT

Traveler	Trip Purposes	Population	VMT	VMT per Capita
Workers (Including Students)	HBW	40,240	179,362	4.46
Workers (Excluding Students)	HBW	23,627	169,326	7.17
Residents	HBW + HBO	15,250	154,296	10.09

SOURCE: Fehr & Peers, 2017

Between Fall 2018 and Fall 2020 daily VMT per worker will be reduced. The reason for the reduction in the daily VMT per worker is the addition of 2,020 new graduate student beds in Escondido Village. The new housing reduces the number of students commuting to the campus.

Daily VMT per resident will increase between Fall 2018 and 2020, but remains at a level that is well below regional averages. The increase in resident daily VMT per capita is due to the fact that

the Escondido Village Graduate Student Residences project will add a large number of graduate student beds, which will increase the ratio of graduate student to undergraduate beds on the campus. Because graduate student housing generates higher VMT per capita than undergraduate student housing, this proportionate shift will slightly increase daily VMT per capita for campus residents.

Impact Evaluation

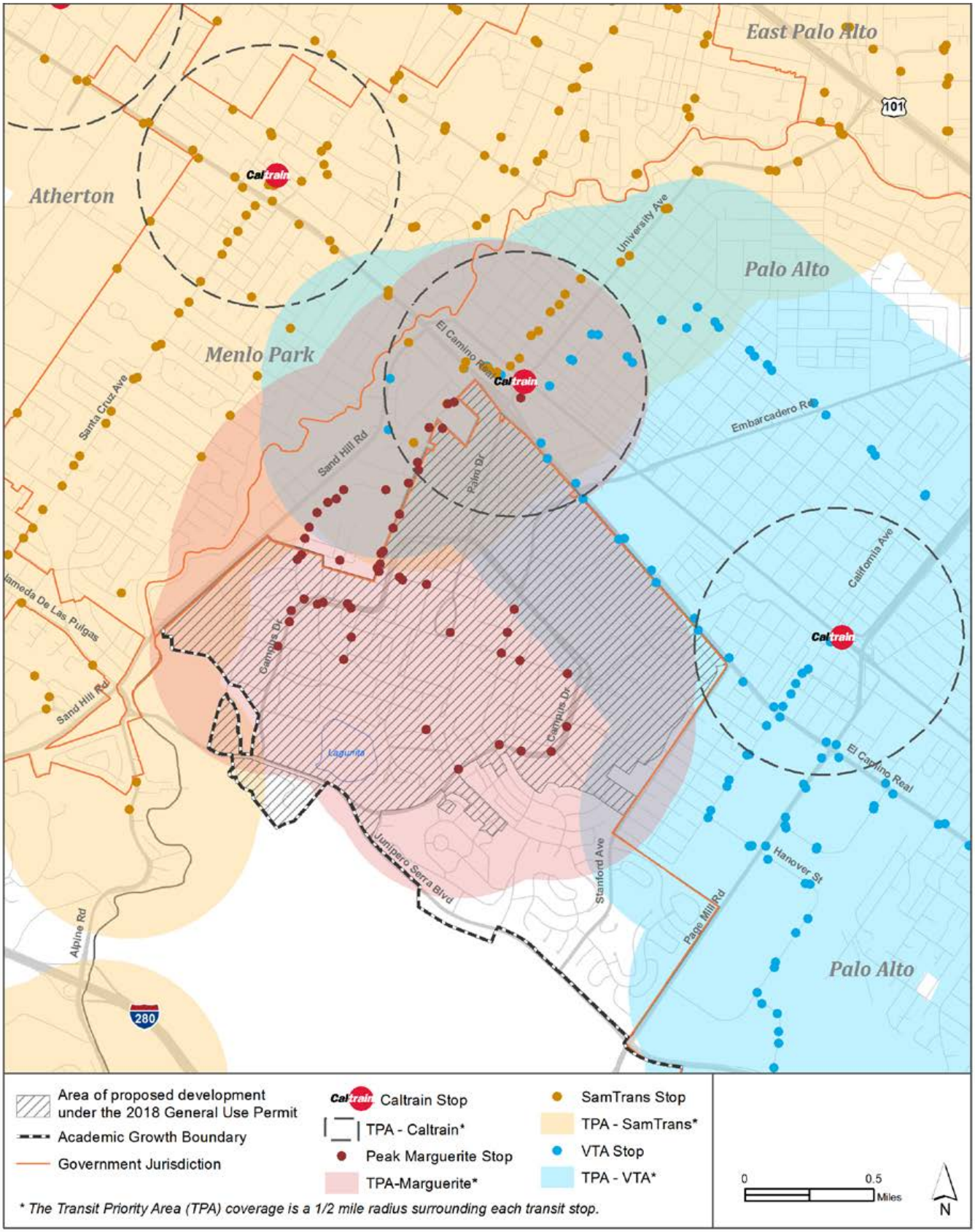
Impact 5.15-12: The Project would be located within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor. (*Less than Significant*)

As explained above, OPR has proposed that lead agencies generally should presume that residential, retail, and office projects, as well as mixed-use projects that are a mix of these uses, proposed within one-half mile of an existing major transit stop or an existing stop along a high-quality transit corridor have a less-than-significant impact on VMT. A major transit stop is a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A high-quality transit corridor means a corridor with fixed route bus with service intervals no longer than 15 minutes during peak commute hours.

Figure 5.15-10 shows the major transit stops and stops along high quality transit corridors on and near the Stanford campus, and land area within 1/2 mile of such stops and corridors. Caltrain stations are major transit stops, and the El Camino Real corridor served by VTA and SamTrans is a high-quality transit corridor. In addition to these three public transit systems, Stanford operates its own private transit system called the Marguerite Shuttle. One of the key aspects of the Marguerite Shuttle service is the provision of "last mile" service between the Stanford campus and the Downtown Palo Alto Intermodal Transit Center where all three public transit systems provide high-quality transit service. The Marguerite Shuttle service operates approximately 20 routes to various destinations on- and off-campus. During the morning peak period, buses are scheduled to meet each train. This service includes the provision of multiple buses on some routes in the morning to ensure sufficient capacity is available when large numbers of users arrive on the Bullet and Express trains. In the afternoon, the Marguerite Shuttle service is designed to provide sufficient capacity to get Caltrain users to the station ahead of train departures.

Based on the operations described above, Figure 5.15-10 shows the bus stops on the Stanford campus that receive four or more buses per hour, during the morning and evening peak periods, for routes that connect to the Downtown Palo Alto Intermodal Transit Center. Most of these bus stops have five or more buses, and some in the Quarry Road corridor have as many as 20 buses per hour. Therefore, Marguerite users have multiple, frequent opportunities to travel between the campus and the Caltrain Station and, the frequency of service at these stops meets, or exceeds, the level of service standard of providing 15-minute fixed route service.

Development under the proposed 2018 General Use Permit would constitute infill development that represents increased intensity and density compared to existing levels at Stanford. Stanford is located adjacent to Caltrain stations, and is well-served by transit.



Stanford 2018 General Use Permit . 160531

SOURCE: Fehr & Peers

Figure 5.15-10
Transit Priority Areas for Nearby Transit Agencies

Based on the January 2016 *Revised Proposed Changes to the CEQA Guidelines* proposed by OPR for assessment of VMT, the proposed 2018 General Use Permit can be presumed to result in a less-than-significant impact.

Mitigation: None required.

Impact 5.15-13: The proposed Project VMT would not exceed the numeric thresholds recommended by OPR. (*Less than Significant*)

Even though the proposed Project would be presumed to result in a less-than-significant impact under OPR's proposed CEQA Guidelines amendments (see Impact 5.15-12, above), this EIR also assesses the proposed Project's consistency with the numeric standards suggested by OPR.

Fall 2035 Campus VMT Generation

In 2035, the study area would include approximately 29,915 faculty, employees, postdoctoral students and contractors and an enrollment of approximately 19,515 undergraduate and graduate students. The worker population including faculty, employees, postdoctoral students, contractors and undergraduate and graduate students would be approximately 49,430 people. The campus resident population would be approximately 13,350 people including spouses and families.

Trip lengths for the 2035 calculations were adjusted from the 2015 levels (increased by 2 to 3 percent) based on the projected changes in the 2040 VTA travel model, taking into account the regional forecasts of growth patterns, future distribution of Bay Area housing and jobs, and improvements and transportation system and services, and their effects on travel mode choice. The resulting Fall 2035 daily VMT per capita for campus workers and residents is indicated in the **Table 5.15-41**. Similar to the previous scenarios, worker VMT excluding students has been provided as a sensitivity analysis.

TABLE 5.15-41
FALL 2035 TYPICAL WEEKDAY VMT

Traveler	Trip Purposes	Population	VMT	VMT per Capita[a]
Workers (Including Students)	HBW	49,428	223,842	4.53
Workers (Excluding Students)	HBW	29,915	212,555	7.11
Residents	HBW + HBO	19,353	207,986	10.75

[a] Worker HBW VMT were adjusted by +2%, and Resident HB VMT were adjusted by +3% to reflect changes in trip lengths derived from the VTA model.

SOURCE: Fehr & Peers, 2017

Between Fall 2018 and Fall 2035, daily VMT per worker will increase primarily due to the projected increase in trip length for the Bay Area. The amount of the increase in daily VMT per worker is reduced by adding 550 faculty housing units on the campus. Since these units would be in the core area of the campus, these workers would choose to use alternative modes of travel including bicycling, walking, or riding the Marguerite.

Resident daily VMT per capita is expected to increase from Fall 2018 to Fall 2035 because the ratio of graduate student housing to undergraduate student housing will change. Prior to the EV Graduate Residences project, Stanford housed approximately 55 percent of its graduate students on the campus. With the EV Graduate Residences, Stanford will house approximately 70 percent of its graduate students on campus. Graduate students have a higher daily VMT per capita than undergraduate students. Some spouses of graduate students are assumed to generate home-based work trips off-campus and both the graduate students and spouses generate more home-based-other trips than undergraduate students. Further, by Fall 2035, Stanford is proposing to add up to 550 new housing units occupied by faculty/staff. These new faculty and staff would generate additional home-based trips at a per capita rate that is higher than the addition of student housing units.

Primary reasons that Stanford's Worker VMT generation is so low compared to the regional average are: an aggressive and successful TDM program, and the provision of on-campus housing for faculty and students. The primary reason that Stanford's Resident VMT generation per capita is so low compared to the regional average is that Stanford campus residents can commute to work or class without using personal vehicles.

Worker and residential daily VMT per capita generated by the project in 2035 and the VMT Thresholds of Significance are shown in **Table 5.15-42**. The proposed 2018 General Use Permit home-based work VMT per worker, and home-based VMT per resident are below the significance thresholds, resulting in a less-than-significant impact on VMT.

TABLE 5.15-42
FALL 2035 WITH PROJECT VMT COMPARED TO SIGNIFICANCE THRESHOLDS

Traveler	Trip Purposes	Fall 2035 VMT per Capita	Significance Threshold VMT per Capita (85% of Regional Average)	Finding
Workers	HBW	4.53	13.75	Less than Significant
Residents	HBW + HBO	10.75	14.73	Less than Significant

SOURCE: Fehr & Peers, 2017

Mitigation: None required.

5.15.7 Transit and Bicycle Facility Capacity

OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* states that a project that blocks access to a transit stop or blocks a transit route may interfere with transit functions. By contrast, when evaluating multimodal transportation networks OPR advises:

> *[L]ead agencies generally should not treat the addition of new users as an adverse impact. Any travel-efficient infill development is likely to add riders to transit systems, potentially slowing transit vehicle mobility, but also potentially improving overall destination proximity. Meanwhile, such development improves regional vehicle flow generally by loading less travel onto the regional network than if that development were to occur elsewhere.*

OPR recognizes that increased demand throughout a region may cause a cumulative impact requiring new or additional transit infrastructure. However, OPR states such impacts may be best addressed through a fee program that fairly allocates the cost of improvements not just to projects that locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system.

Even though the addition of new users to transit facilities are not treated as an adverse impact in this EIR, this section provides information regarding the capacity of the public transit system to accommodate growth in ridership resulting from the proposed Project. This section also addresses the potential for growth in bicycle trips resulting from the proposed Project to exceed the capacity of local bicycle facilities.

The analyses presented earlier in this section conservatively assume that Stanford continues its existing TDM programs, but does not expand those programs to achieve the No Net New Commute Trips standard. That assumption produced a reasonable worst-case methodology for purposes of analyzing congestion-based traffic impacts and vehicle miles traveled.

The transit and bicycle facility capacity analysis identifies the increase in transit riders and bicyclists that would be expected to be generated under the 2018 General Use Permit if Stanford were to expand its TDM programs in order to meet the No Net New Commute Trips standard because that assumption results in a reasonable worst-case analysis for evaluating traffic capacity.[11]

New Stanford Transit Users and Bicyclists

For both transit users and bicyclists, estimated numbers were developed for Existing Conditions, Baseline Conditions (2018) and Expanded TDM Conditions (2035). The number of commuters for transit and bicycle modes for each year and scenario is determined by applying commuter mode shares (percentages) as shown in **Figure 5.15-11** to estimated commuter populations, which have been projected for the three analyzed years. The transit and bicycle capacity analyses utilize these estimates to calculate peak hour transit commuters and bicycle commuter estimates, distributing them and measuring their impact by comparing them with existing and anticipated capacity.

[11] Appendix TBC also includes an analysis of transit and bicycle capacity assuming Stanford does not achieve the No Net New Commute Trips standard.

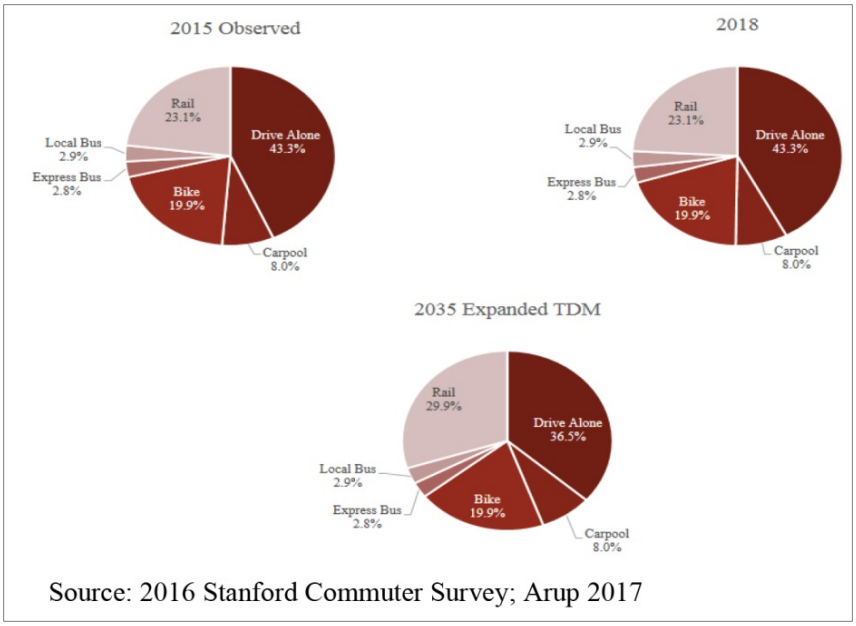


Figure 5.15-11
Existing and Forecasted Stanford Mode Share

For Existing Conditions, mode shares were calculated directly from the 2016 Stanford Transportation Survey, and these were held constant for the Background Conditions year (2018). For Expanded TDM Conditions (2035), mode shares were adjusted to reflect a shift from drive alone commuters to rail commuters.

The Expanded TDM scenario reduces the drive alone mode share from 43.2% to 36.5% between 2018 and 2035, which is the amount necessary to achieve the No Net New Commute Trips standard given the population increases projected to occur during the 2018 General Use Permit and assuming Stanford receives no trip reduction credits for improvements that take non-Stanford campus trips off the road. For purposes of this analysis, drive alone commuters have been shifted to the rail mode. Rail mode share is assumed to increase from 23.1% in 2015 and 2018 to 29.9% in 2035.

The Expanded TDM scenario reduces the drive alone mode share from 43.2% to 36.5% between 2018 and 2035, which is the amount necessary to achieve the No Net New Commute Trips standard given the population increases projected to occur during the 2018 General Use Permit and assuming Stanford receives no trip reduction credits for improvements that take non-Stanford campus trips off the road. For purposes of this analysis, drive alone commuters have been shifted to the rail mode. Rail mode share is assumed to increase from 23.1% in 2015 and 2018 to 29.9% in 2035.

All other modes have been kept constant. Although Stanford may choose to provide additional bus service, this would be provided by Stanford and would not place pressure on public transit providers. Bicycle mode share may increase under an Expanded TDM scenario, but not to a degree that is likely to have a substantial adverse effect on bicycle facility capacity.

Under the Expanded TDM scenario, the greatest pressure on transit services and bicycle infrastructure would occur in the AM and PM peak hours (i.e., 7:00 to 8:00 AM, and 5:00 to 6:00 PM).

The focus of this analysis is on commuters rather than on campus residents. The Stanford Transportation Survey, conducted by Stanford Parking & Transportation Services every year, yields robust data on transit and bicycle use by Stanford commuters. However, little information is available regarding mode choice by campus residents other than their single occupant vehicle trip generation.

Transit Capacity

A transit impact analysis was completed to evaluate the ability of local and regional transit infrastructure and services to accommodate increased Stanford transit ridership anticipated to occur under the proposed 2018 General Use Permit. This analysis was completed for Existing Conditions (2015), Background Conditions (2018) and Cumulative Conditions (2035), to determine what share of peak ridership comprises Stanford University affiliates, and whether peak ridership exceeds capacity standards.

Three transit modes were separately analyzed to determine the ridership of Stanford affiliates. These three transit modes analyzed were commuter rail (Caltrain), express buses serving the campus (Dumbarton Express Line DB, Line AE-F, and AC Transit Line U), and local bus routes operated by the Santa Clara Valley Transportation Authority (VTA) and San Mateo County Transit (SamTrans) that serve the campus.

Caltrain

Approach

To assess the future ridership growth generated by the 2018 General Use Permit and the capacity of Caltrain to accommodate that ridership, the analysis compared the anticipated Caltrain capacity with forecasted ridership growth at peak load stations and determined the share of future ridership attributable to Stanford affiliates.

The three factors considered are capacity, total load, and Stanford campus load. Estimates of each of these factors were generated for 2015, 2018, and 2035. It was assumed that the Caltrain modernization project, which includes electrification in 2021 and further capacity improvements thereafter, will be fully implemented by 2035. This means that 2018 will have no capacity improvements over 2015. Electrification would convert Caltrain rolling stock from diesel locomotive-hauled trains to electric multiple unit (EMU) trainsets between the 4th and King Street Station in San Francisco and the Tamien Station in San Jose. The electrification project would involve the installation of new infrastructure, including traction power supply substations and overhead catenary. After electrification, the number of peak hour trains will increase from the existing 5 trains to 6 trains. Another important improvement that will significantly expand capacity is a platform expansion and train program that would allow trains to increase from 5 to 6 cars per train to 8 cars per train.

Table 5.15-43 shows the capacity assumptions for Caltrain. This analysis defines full train capacity as 120% of seats, allowing for some standees.

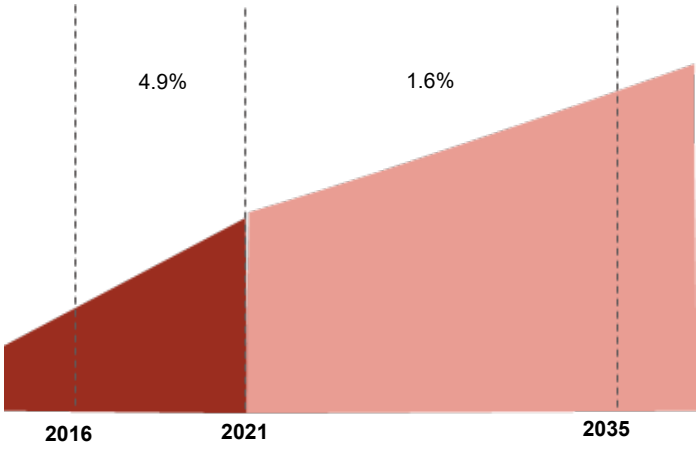
TABLE 5.15-43
CALTRAIN CAPACITY ASSUMPTIONS

	2018	2035
Train type	Diesel Locomotive	Electrical Multiple Unit
Seats per car	126	94
Train length	5 to 6 cars	8 cars
Trains per peak hour	5	6
Seated capacity	3,705	4,512
Total capacity (120% of seats)	**4,446**	**5,414**

NOTE: capacity numbers are rounded

SOURCE: Arup, Core Capacity Study, Caltrain Short Range Transit Plan: FY2015-2024, Scanlon, 2018

Total anticipated Caltrain ridership growth during the peak hour is based on Caltrain 2015 passenger load data along with two separate growth rates that have been applied to future years. The 2015 Caltrain ridership data includes Stanford riders. As shown in **Figure 5.15-12**, the overall annual growth in Caltrain ridership is assumed to be 4.9% from 2015-2021 based on the 20-year historical trend. From 2021-2035, the growth in ridership is assumed to be 1.6% annually based on ridership forecasts in the Peninsula Corridor Electrification Project EIR.



SOURCE: Peninsula Corridor Electrification Project (PCEP) Final Environmental Impact Report (FEIR), January 2015.

Figure 5.15-12
Caltrain Annual Growth Rate

During the AM peak of 7:00-8:00 AM, the northbound and southbound peak load Caltrain stations that Stanford commuters affect are California Avenue and San Carlos. During the PM peak of 5:00-6:00 PM this trend reverses, with the San Carlos Station being the northbound peak load point and the California Avenue Station being the southbound peak load point. Only passengers boarding, rather than alighting, at peak load stations during the peak hour were counted in the ridership estimate. It is also important to note that these peak load points represent the highest passenger load point that Stanford commuters affect. Both the AM and PM system wide peak load, peak direction load points are at San Mateo Station, and is not affected by Stanford commuters.

Analysis

This section analyzes growth in Stanford rail commuters on Caltrain, assuming that expanded TDM strategies designed to achieve the no net new commute trips standard are implemented through 2035. As mentioned, it was conservatively assumed that these strategies shifted all drive alone commuters to rail.

Table 5.15-44 shows how Stanford commuters were estimated for the AM and PM peak hours. To determine the proportion of Stanford-affiliated Caltrain riders during the peak hour, estimates of daily Stanford rail commuters were adjusted to eliminate a small proportion of rail commuters that use other services (e.g., BART, ACE) as their primary mode. It was assumed that of the Stanford affiliates that commute via Caltrain, 85% ride Caltrain every day. Based on the 2016 Commuter Survey, 40% of Stanford Caltrain commuters ride Caltrain during the AM peak hour and 36% ride Caltrain during the PM peak hour.

TABLE 5.15-44
STANFORD ESTIMATED PEAK HOUR PASSENGER LOAD (ACADEMIC CAMPUS ONLY)
EXPANDED TDM SCENARIO

	2015	2018	Change 2015-18	2035	Change 2018-35
Stanford Commuters	19,475	18,139	-1,336	22,489	+4,350
Rail Mode Share (%)	23.1%	23.1%		29.9%	
Adjustment for sick days, vacation, etc.	85%	85%		85%	
% of rail commuters on Caltrain*	96%	96%		96%	
Daily Caltrain Commuters	3,672	3,420	-252	5,494	+2,074
Percentage of Stanford-bound commute trips in peak hour**	40%	40%		40%	
Total AM peak hour trips - Caltrain	1,469	1,368	-101	2,197	+829
Percentage of home-bound commute trips in peak hour**	36%	36%		36%	
Total PM peak hour trips - Caltrain	1,322	1,231	-91	1,978	+747

* 4% of Stanford rail commuters use ACE, BART, or another rail system as their primary mode
** From 2015 Stanford Transportation Survey

SOURCE: Arup, 2017

Table 5.15-45 and **Table 5.15-46** allocate Stanford commuters by their direction of travel, either south or north of campus and thus traveling northbound or southbound in the morning or afternoon. A minority of commuters do not affect the peak load points as they are not on the train at that load point. AM peak hour Stanford Caltrain trips are projected to decrease from 1,469 in 2015 to 1,368 in 2018, a result of a temporary reduction of Stanford's commuter population. It is then projected to grow from 1,368 passenger trips in 2018 to 2,197 trips in 2035, an increase of 829. During the PM peak hour, Stanford passenger trips are projected to decrease from 1,322 in 2015 to 1,231 in 2018. Stanford PM peak ridership on Caltrain would increase from 1,231 passenger trips in 2018 to 1,978 riders in 2035, an increase of 747 passengers.

TABLE 5.15-45
TOTAL STANFORD COMMUTERS ON CALTRAIN DURING AM PEAK HOUR (ACADEMIC CAMPUS ONLY)
EXPANDED TDM SCENARIO

	2015	2018	2035
All AM Peak Hour Stanford Commuters	**1,469**	**1,368**	**2,197**
Northbound at peak load point (51%)	749	698	1,121
Southbound at peak load point (43%)	632	588	945

SOURCE: 2015 Stanford Commuter Survey; Arup, 2017

TABLE 5.15-46
TOTAL STANFORD COMMUTERS ON CALTRAIN DURING PM PEAK HOUR (ACADEMIC CAMPUS ONLY)
EXPANDED TDM SCENARIO

	2015	2018	2035
All PM Peak Hour Stanford Commuters	**1,322**	**1,231**	**1,978**
Northbound at peak load point (43%)	568	529	816
Southbound at peak load point (51%)	674	628	968

SOURCE: 2015 Stanford Commuter Survey; Arup, 2017

Figure 5.15-13 and **Figure 5.15-14** show the excess Caltrain capacity at the California Avenue/ San Carlos stations in 2015 for the AM peak hour in the northbound and southbound direction, respectfully, and how much of that capacity is taken up in 2018 and 2035. The bars for 2018 and 2035 represent additional load in those years, with proportions of that load made up by Stanford campus and non-Stanford campus passengers shown in different color bands. In 2018, prior to electrification, the total passenger load would come closer to meeting the capacity, but would not exceed it. By 2035, loads of Stanford campus and non-Stanford campus passengers increase, but capacity is expected to increase as well. Therefore, peak passenger load in 2035 would not exceed the peak hour capacity.

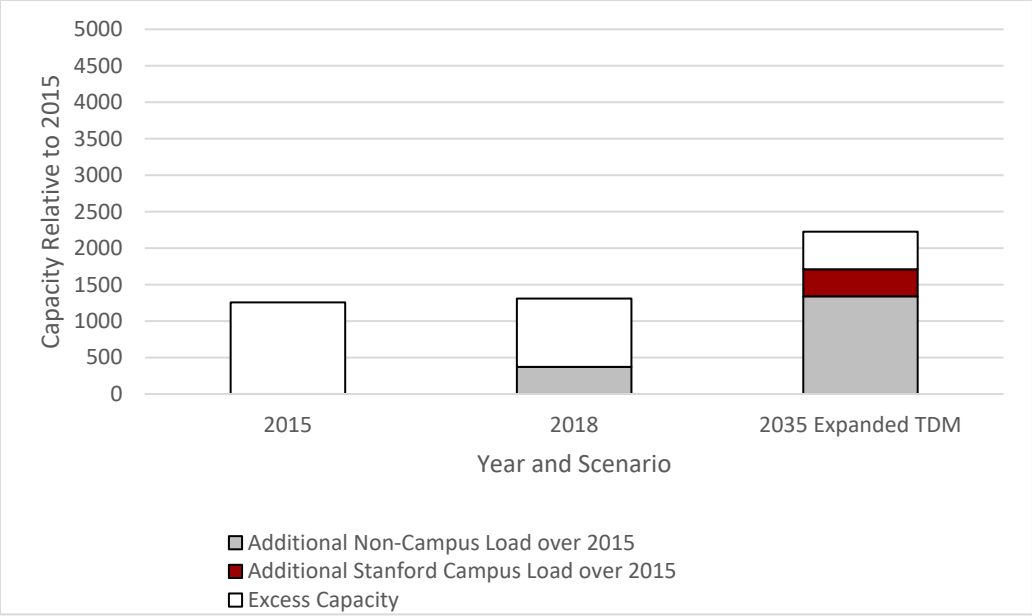


Figure 5.15-13
Caltrain AM Peak Hour Northbound Passenger Load by User Type at California Avenue Station – Expanded TDM Scenario

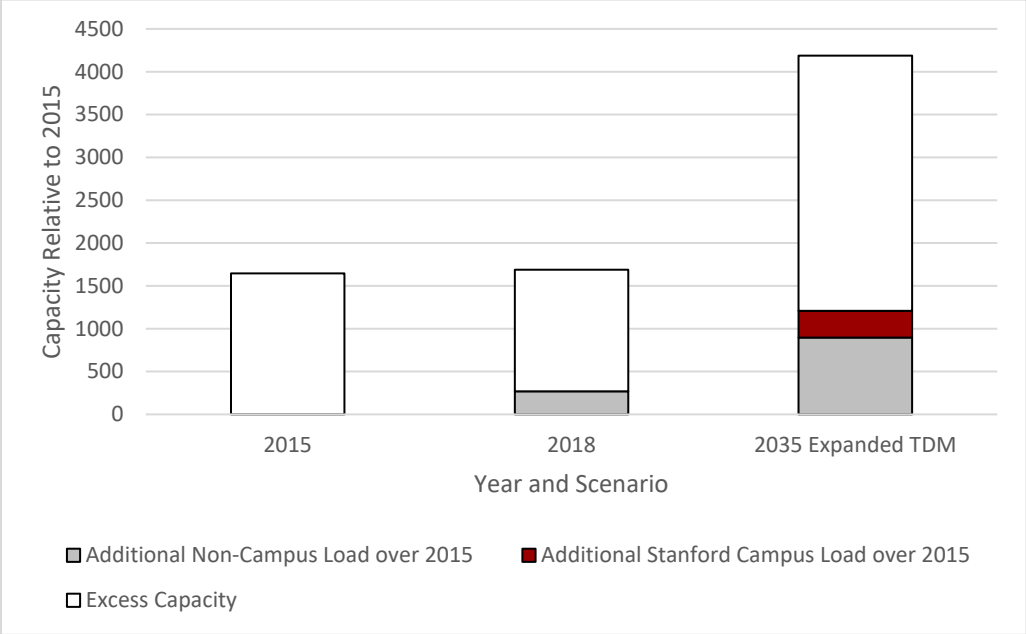


Figure 5.15-14
Caltrain AM Peak Hour Southbound Passenger Load by User Type at the San Carlos Station – Expanded TDM Scenario

Figure 5.15-15 and **Figure 5.15-16** show the excess Caltrain capacity at the San Carlos/ California Avenue stations in 2015 for the PM peak hour in the northbound and southbound direction, respectfully, and how much of that capacity is taken up in 2018 and 2035.

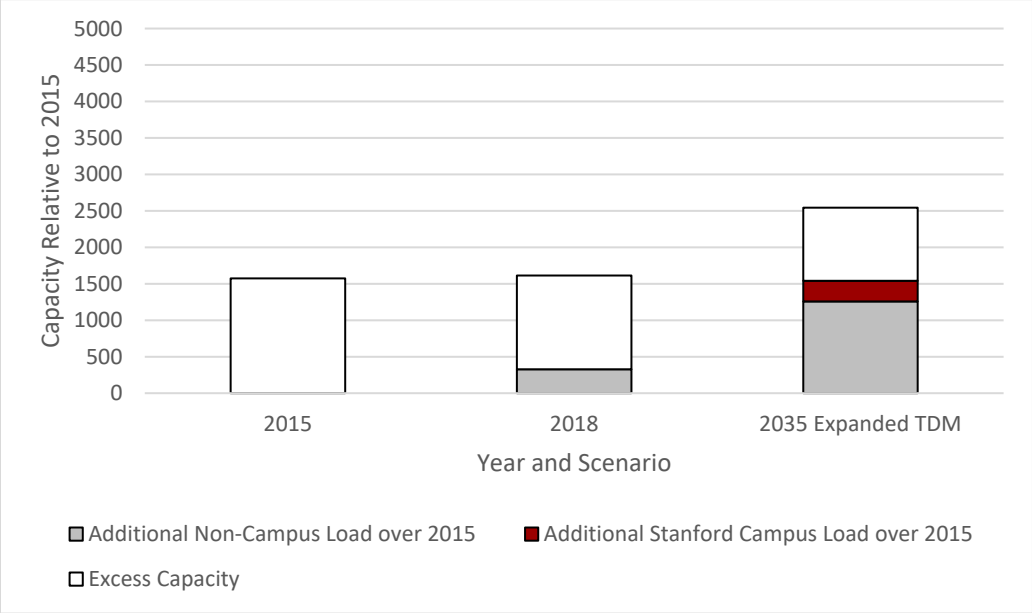


Figure 5.15-15
Caltrain PM Peak Hour Northbound Passenger Load by User Type
at the San Carlos Station – Expanded TDM Scenario

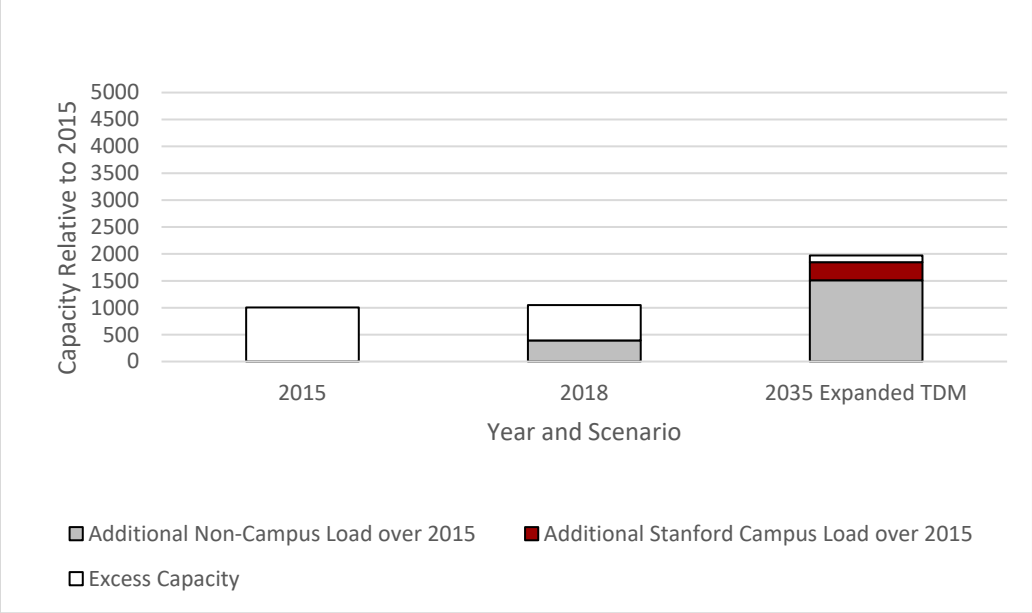


Figure 5.15-16
Caltrain PM Peak Hour Southbound Passenger Load by User Type
at California Avenue Station – Expanded TDM Scenario

In sum, growth in overall Caltrain ridership, including Stanford ridership, would not exceed capacity at any of the peak load points analyzed, which only include those that are affected by Stanford commuters. Between 2015 and the 2018 General Use Permit baseline year, capacity is expected to remain unchanged, but growth in demand would not result in capacity to be exceeded at any of the peak load loading points. During the 2018 General Use Permit, capacity is expected to increase with electrification and other modernizations allowing for an additional peak hour train trip and, even more significantly, an expansion from five/six-car to eight-car trains. These improvements would provide enough capacity at the peak load points affected by Stanford to meet demand.

Express Bus

Approach

To assess the future ridership growth from the 2018 General Use Permit and the capacity of express bus routes to accommodate that ridership, the analysis compares the anticipated capacity with forecasted ridership growth at peak load points and determines the share of future ridership (and if applicable, the share of the ridership impact) attributable to Stanford affiliates.

The three express bus transit routes considered in this analysis serve the Stanford campus are the Marguerite Line AE-F, AC Transit Line U, and Dumbarton Express Line DB which all provide service to and from the East Bay via the Dumbarton Bridge.

- The Line AE-F operates Monday through Friday serving Stanford, the Fremont BART station, Fremont Wells Fargo park-and-ride lot, ACE/Amtrak Fremont station, Kaiser park-and-ride lot, Ardenwood park-and-ride lot, Embarcadero Road and Wildwood Avenue, and Embarcadero Road and N. California Avenue.

- Line U operates during the weekday serving the Stanford campus with stops at the Fremont BART, Fremont ACE/AMTRAK station, and Ardenwood park-and-ride lot.

- Dumbarton Express operates Line DB during the weekday serving the Stanford campus with stops in the Eastbay along the route between Union City BART and the Ardenwood park-and-ride lot. Another Dumbarton Express bus route, Line DB1, was not considered as it does not serve the Stanford academic campus.

It is possible that an Expanded TDM scenario would include extensions to Stanford's Marguerite bus routes. However, these routes would be provided by Stanford and therefore would not affect transit capacity for surrounding communities or the region as a whole. It is also possible that by 2035 there could be additional public transit routes that serve the campus from VTA, SamTrans or another provider which could help to accommodate Stanford commuter demand. However, it is conservatively assumed that this would not occur.

As with the Caltrain analysis, the three factors considered are capacity, total load, and Stanford campus load. Estimates of each of these factors were generated for 2015, 2018, and 2035. Peak hour express bus capacity was determined by multiplying the number of vehicles by the seats per bus.

Table 5.15-47 shows estimated capacity for all three routes in 2015. Line AE-F currently has significantly greater capacity than the other routes as it provides an additional peak hour trip and operates with a combination of 45 foot over the road coaches and double-deck buses (an average vehicle capacity of 65 passengers). Total capacity for express bus routes is considered to be 100% of seats (i.e., no standees) per VTA standards, with the exception of line DB, which utilizes standard urban transit buses with seating plans designed for standees (120% of seated capacity is used for line DB). AC Transit plans to employ higher capacity double-deck buses on line U, as reflected in the 2018 capacity assumptions. By 2035 additional capacity increases over 2018 levels are highly probable though exact levels are difficult to predict and not currently programmed. SamTrans' Dumbarton Transportation Corridor Study recently recommended significant enhancements to transbay bus routes, including both the introduction of new routes and increased frequency on existing routes (e.g., Dumbarton Express). To be conservative, an increase of one peak hour trip for each service was assumed, or an increase from seven to ten trips overall.

TABLE 5.15-47
EAST BAY EXPRESS PEAK-HOUR BUS CAPACITY

	2015			2018			2035		
Bus Line	**Trips**	**Per vehicle**	**Total**	**Trips**	**Per vehicle**	**Total**	**Trips**	**Per vehicle**	**Total**
Line AE-F	3	65	195	3	65	195	4	65	260
Line U	2	57	114	2	81	162	3	81	243
Line DB (Dumbarton Express)	2	50	84	2	50	121	3	50	181
Total	**7**	**172**	**430**	**7**	**196**	**478**	**10**	**196**	**684**

SOURCE: Arup, 2017

Analysis

Average daily ridership for each of the three express bus lines was obtained for 2015/2016. Factors were then applied to estimate the peak hour ridership. The nature of these services are such that the total ridership is equivalent to the total load. This analysis focuses on the lines crossing the Dumbarton Bridge. The peak load point is at the Dumbarton Bridge both in the westbound and eastbound directions, as westbound riders all board in the east bay, and eastbound riders all board at Stanford or other stops on the peninsula.

Table 5.15-48 shows the total estimated peak load for each time period. To estimate future passenger load, a 1.1% annual growth rate was applied. This represents the overall ridership trends for DB and Line U service between 2007 and 2016.

As in the Caltrain analysis, Stanford passenger load is calculated by multiplying commuter populations and estimated express bus mode share. **Table 5.15-49** shows how peak hour Stanford express bus commuters were estimated for the AM and PM peak hours.

TABLE 5.15-48
TOTAL PASSENGER LOAD

Time Period	Direction	2015	2018	Change 2015-18	2035	Change 2018-35
AM peak (8– 9)	Westbound	284	294	+10	353	+59
PM peak (5 -6)	Eastbound	284	294	+10	353	+59

SOURCE: Arup, 2017

TABLE 5.15-49
STANFORD ESTIMATED PEAK HOUR PASSENGER LOAD

	2015	2018	Change 2015-18	2035	Change 2018-35
Stanford Commuters	19,475	18,139	-1,336	22,489	+4,350
Express Bus Mode Share (%)	2.8%	2.8%		2.8%	
Assumes 85% commute each day	85%	85%		85%	
Total Express Bus Trips (Daily One-Way)	465	433	-32	537	+104
AM Peak Hour (One-Way)	144	134	-10	166	+32
PM Peak Hour (One-Way)	153	143	-10	177	+34

SOURCE: Arup, 2017

Figure 5.15-17 shows the excess express bus capacity in 2015 for the AM peak hour and peak direction and how much of that capacity is taken up in 2018 and 2035. The bars for 2018 and 2035 represent additional load in those years, with proportions of that load made up by Stanford campus and non-Stanford campus passengers shown in different color bands. Between 2015 and 2018, a small addition in non-Stanford passenger load is expected, and additional bus capacity is also expected to be available, resulting in sufficient capacity for both Stanford and non-Stanford passengers. Between 2018 and 2035, increases in Stanford and non-Stanford passenger load are expected. However, demand would not exceed capacity, which is also higher due to an assumption of additional service.

Figure 5.15-18 shows the excess express bus capacity for the PM peak hour and peak direction in 2015 and how much of that capacity is taken up in 2018 and 2035.

In sum, existing excess express bus capacity in 2015 is sufficient to handle additional demand in 2018 and 2035 projected from modest growth trends in Stanford and non-Stanford ridership. However, this analysis assumes that there would be an additional peak hour bus added to each of the three East Bay express services during the lifetime of the 2018 General Use Permit as well as some adjustments to vehicle capacity. These changes would add a capacity buffer should ridership grow more than anticipated.

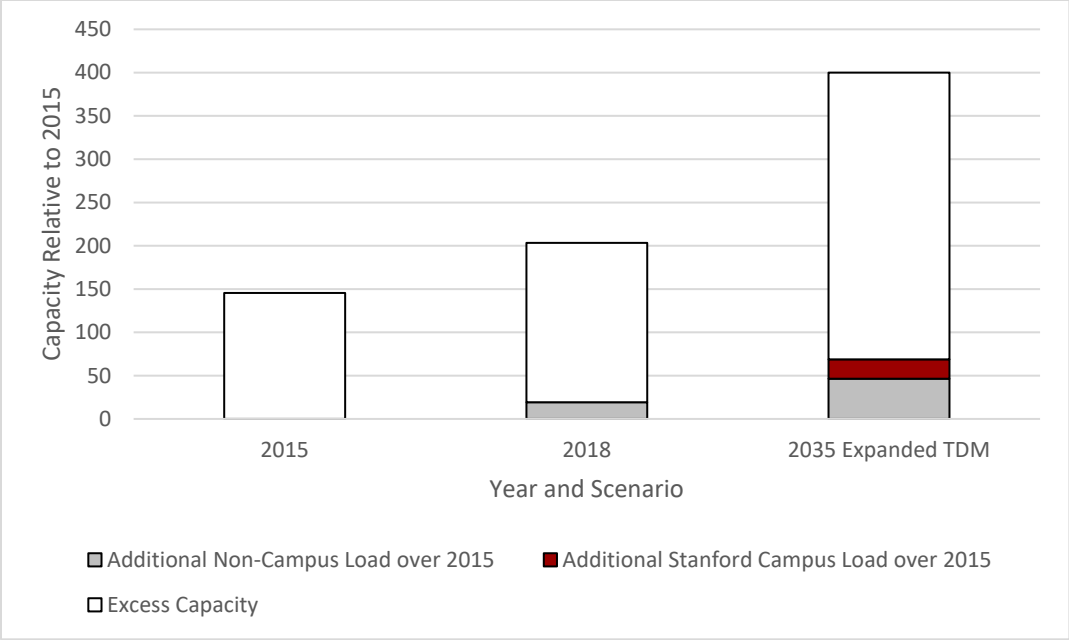


Figure 5.15-17
AM Westbound Peak Hour Express Bus Peak Load

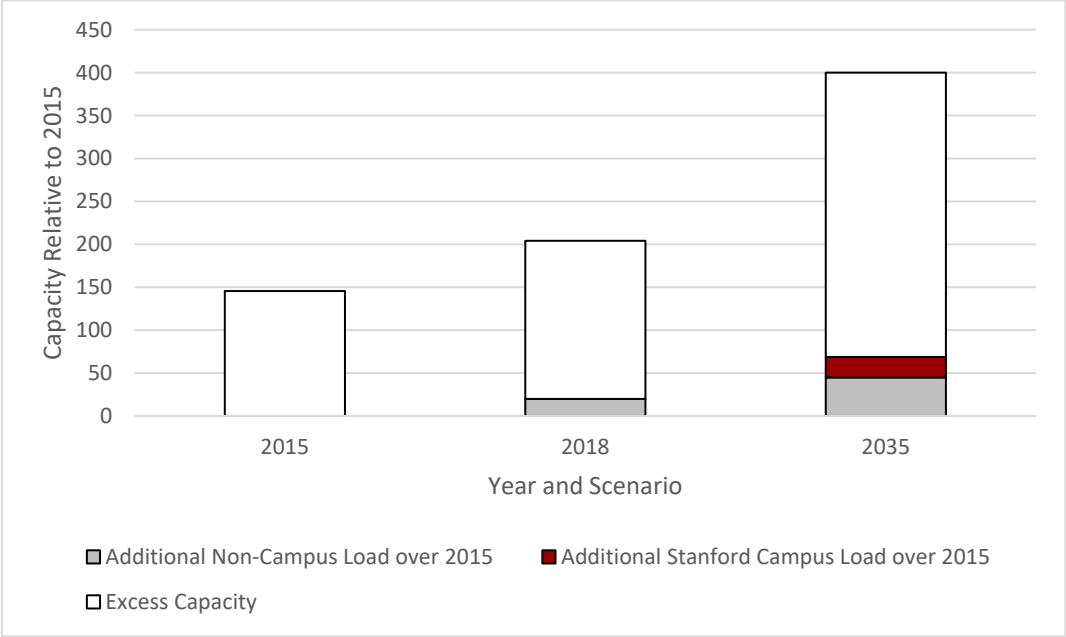


Figure 5.15-18
PM Eastbound Peak Hour Express Bus Peak Load

Local Bus

There are seven VTA and SamTrans routes that serve the Stanford campus. These local buses are currently a relatively minor mode for Stanford commuters. None of these routes directly serve the campus, and commuters living close by to campus tend to drive or bike to avoid a transfer at the Palo Alto Transit Center.

The change in Stanford local bus ridership was calculated between 2015 and 2018, and between 2018 and 2035, based on Stanford campus population growth and an assumption of no change to local bus mode share. **Table 5.15-50** shows these projections. There would be a reduction in local bus commuters from 2015 to 2018, and an increase of 38 AM peak hour passengers and 37 PM peak commuters from 2018 to 2035.

TABLE 5.15-50
STANFORD LOCAL BUS COMMUTER PROJECTIONS

	2015	2018	Change 2015-18	2035	Change 2018-35
Stanford Commuters	19,475	18,139	-1,336	22,489	+4,350
Local Bus Mode Share (%)	2.9%	2.9%		2.9%	
Total Bus Trips (Daily)	561	526	-35	652	+126
AM Peak Hour (7-8 AM)	168	158	-10	196	+38
PM Peak Hour (5-6 pm)	163	153	-10	189	+37

SOURCE: Arup, 2017

The additional Stanford campus trips were allocated to bus routes proportionate to the overall existing ridership levels of those buses. The only route that would gain more than 10 peak hour trips between 2018 and 2035 from the Stanford campus would be the VTA 22 bus route, with an additional 23 Stanford campus riders in the AM peak hour and 22 additional Stanford campus riders in the PM peak hour. These increases are not judged to be significant enough to warrant further analysis.

Bicycle Facility Capacity

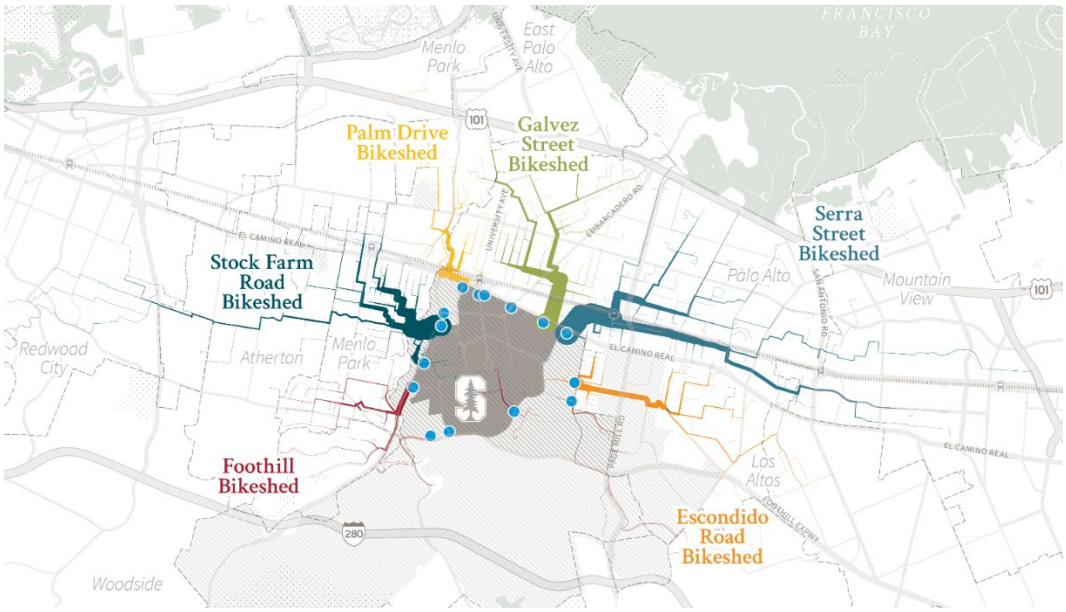
A bicycle facility analysis was completed to examine the growth in future commuter cyclists on community roads and bicycle facilities as they increase with Stanford population growth.

Approach

The analysis evaluates the capacity of roads and facilities to accommodate Stanford bicycle commuters at the locations that would be most affected by growth in bicycle ridership under the 2018 General Use Permit, using estimates of existing and future cyclists on bike corridors leading into campus. Peak hour bicycle volumes were converted into cyclists per minute to provide an indication of how intensely the corridors are being utilized and whether these additional bicycle volumes could reasonably be expected to have an impact on the capacity of the corridors.

Analysis

Figure 5.15-19 shows bicycle gateways to the Stanford campus. The thickness of the travel paths shown on Figure [same as above] corresponds to the proportional number of Stanford bicyclists who use that path to commute to campus. Estimates of existing bicycle commuters on gateways serving the Stanford campus were derived from bicycle counts conducted at entry points into the campus in May 2015.



SOURCE: Alta 2017

Figure 5.15-19
Bicycle Gateway Locations

Table 5.15-51 shows AM and PM peak hour bicycle volumes for each gateway location for 2015, 2018, and 2035. 2015 data represents actual counts, while 2018 and 2035 are projected counts based on Stanford commuter population growth. This is then translated into cyclists per minute. Existing estimated bicycle frequencies during the peak commute hour in 2035 range from 0.1 cyclists to 3.1 cyclists per minute.

The campus gateways contain Class 1 (bike path) and Class II (bike lanes) bicycle facilities. Both types of bicycle facilities are capable of handling many more than 3.1 cyclists per minute without cyclists needing to ride side by side. A Class I facility can accommodate approximately 1,500 bicyclists per hour and a Class II facility can accommodate approximately 1,000 bicyclists per hour. Therefore, the bicycle capacity analysis indicates that anticipated growth in bicycle commuters under the 2018 General Use Permit would not exceed bicycle infrastructure capacity. Even if the bicycle mode share were to increase significantly due to improvements that encourage more cycling, capacity would not be a concern.

TABLE 5.15-51
ESTIMATED PEAK HOUR BIKES PER MINUTE

	Peak Hour Bikes						Peak Hour Bikes Per Minute					
	2015		2018		2035		2015		2018		2035	
Bicycle Gateway	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Serra St SW of El Camino Real	144	118	134	110	166	136	2.4	2.0	2.2	1.8	2.8	2.3
Palm Dr S of Arboretum Rd	132	159	123	148	152	184	2.2	2.7	2.0	2.5	2.5	3.1
Escondido Rd W of Olmsted Rd	117	94	109	88	135	109	2.0	1.6	1.8	1.5	2.3	1.8
Stock Farm Rd E of Sand Hill Rd	91	93	85	87	105	107	1.5	1.6	1.4	1.4	1.8	1.8
Welch Rd N of Oak Rd	55	41	51	38	64	47	0.9	0.7	0.9	0.6	1.1	0.8
Bowdoin W of Stanford Ave	40	40	37	37	46	46	0.7	0.7	0.6	0.6	0.8	0.8
Path Entrance W of El Camino at Churchill Rd	33	35	31	33	38	40	0.6	0.6	0.5	0.5	0.6	0.7
Quarry Rd N of Campus Dr	29	27	27	25	33	31	0.5	0.5	0.5	0.4	0.6	0.5
Yale St W of Stanford Ave	28	29	26	27	32	33	0.5	0.5	0.4	0.5	0.5	0.6
Olmsted Rd N of Escondido Rd	28	19	26	18	32	22	0.5	0.3	0.4	0.3	0.5	0.4
Campus Dr West N of Junipero Serra Blvd	25	23	23	21	29	27	0.4	0.4	0.4	0.4	0.5	0.4
Galvez St S of Arboretum Rd	22	40	20	37	25	46	0.4	0.7	0.3	0.6	0.4	0.8
Lasuen St S of Arboretum Rd	22	29	20	27	25	33	0.4	0.5	0.3	0.5	0.4	0.6
Oberlin St W of Stanford Ave	22	13	20	12	25	15	0.4	0.2	0.3	0.2	0.4	0.3
Wellesley St W of Stanford Ave	14	15	13	14	16	17	0.2	0.3	0.2	0.2	0.3	0.3
Campus Dr East E of Junipero Serra Blvd	10	9	9	8	12	10	0.2	0.2	0.2	0.1	0.2	0.2
Raimundo W of Stanford Ave	5	7	5	7	6	8	0.1	0.1	0.1	0.1	0.1	0.1
Santa Maria Ave N of Junipero Serra Blvd	2	2	2	2	2	2	0.0	0.0	0.0	0.0	0.0	0.0

SOURCE: Gateway Bicycle Counts, May 2015; Arup, 2017

5.15.8 On-Campus Parking Supply and Off-Campus Parking Restrictions

This section provides information regarding Stanford's on-campus parking supplies and the surrounding communities' off-campus parking restrictions. The information is intended to respond to concerns raised by community members regarding the potential for Stanford commuters and residents to park in off-campus residential neighborhoods. The analysis demonstrates that substantial off-campus parking is not anticipated to occur.

On-Campus Parking

Existing Parking Supply and Utilization

Parking is distributed throughout the Stanford campus, with the exception of the pedestrian campus core. The campus includes six parking structures and several dozen surface lots. Paid visitor parking is provided in most of the larger lots and structures. All but two parking structures (Via Ortega and the Roble Field) are located directly off Campus Drive or outside the Campus Drive loop.

While there have been new parking structures constructed under the 2000 General Use Permit, they have largely replaced other parking facilities on campus. Stanford has been replacing surface parking in the campus core with structures outside the campus core, with the goal of removing vehicles from the pedestrian areas of campus, and maximizing opportunities for infill development. For example, in Academic Year 2014/15, 395 parking spaces in lots along Santa Teresa were removed for construction projects. These spaces were replaced in the Roble Field Garage that opened in 2017.

Based on data from the P&TS parking inventory for Fall 2015, approximately 86 percent of campus spaces were occupied on a typical day (i.e., Monday and Thursday) when Stanford was in session, which indicates that there is enough supply to minimize spillover parking in the areas surrounding the campus. Stanford's parking condition is not static; a wide array of visitors associated with meetings, special events, performances, cultural attractions, and athletic events causes parking occupancy to fluctuate by day, time, and location.

The total number of active campus commuter and residential permits has declined from a high of nearly 21,000 permits sold in 2004-2005 to fewer than 18,000 sold in 2015-2016. During this time frame, enrollment in the Commute Club has steadily increased, more than doubling since 2004-2005. These two trends reflect Stanford's development of a robust TDM program to contain traffic growth in response to the No Net New Commute Trips standard. Most notably, permit sales have declined, even as the square footage of the campus has increased under the 2000 General Use Permit.

Based on data from October 2015 through January 2016, Stanford saw an average of around 2,300 daily visitor transactions for pay-by-space parking at the 1,871 spaces designated for visitor use. During campus holidays, these numbers were much lower. These transactions do not include

parking at reserved spaces, paid directly to mechanical parking meters, or from individuals using scratch-off event permits (i.e., E Scratchers).

Figure 5.15-20 shows that as of August 2016, the total supply of parking outside the Campus Residential zoning districts was 18,125 spaces, mostly due to a net decrease in spaces resulting from removal of surface lots and construction of parking structures. Projects in the pipeline through Fall 2018 are expected to bring this total to 19,325 spaces, which is 2,326 spaces under the parking authorization established by the 2000 General Use Permit. With the parking constructed in association with the EV Graduate Residences and other development under the 2000 General Use Permit, this total is expected to increase to 20,171, leaving 1,480 spaces remaining under the 2000 General Use Permit authorization.

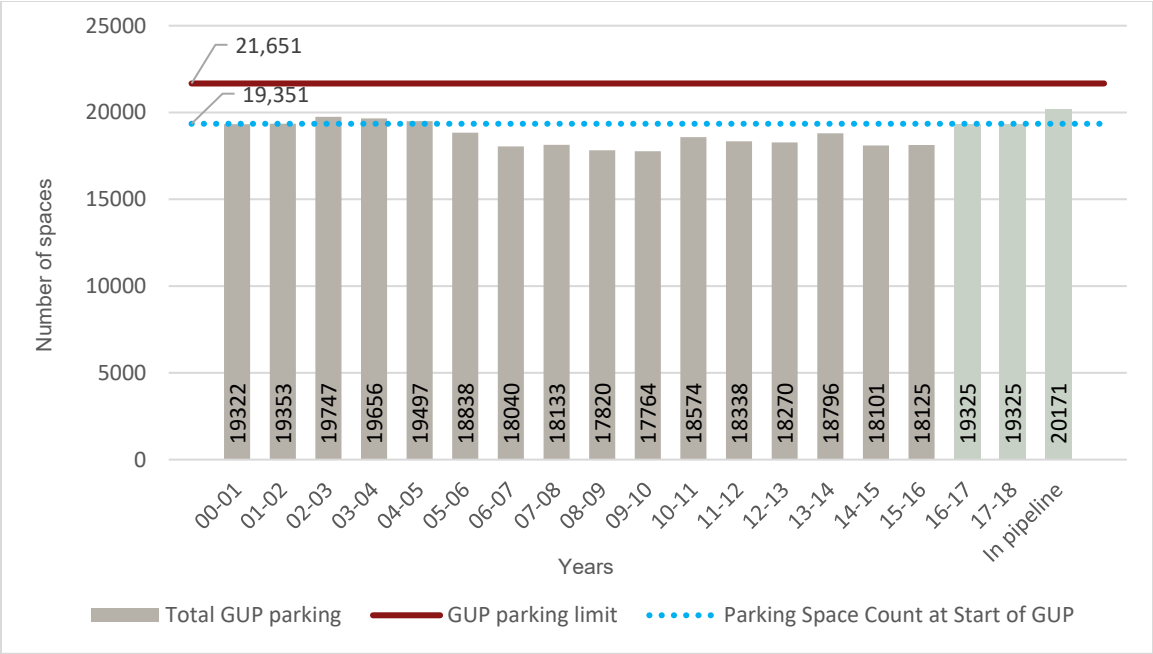


Figure 5.15-20
2000 General Use Permit Parking Supply and Limit

Project Approach to Accommodating Parking Demand

Stanford has remained well beneath its 2000 General Use Permit parking allocation for two reasons. First, car ownership by Stanford students has been trending downward. Second, permit purchases by faculty and staff has declined over time, although that rate of decline has flattened out. Both of these reductions are due in part to Stanford's extensive TDM programs. In addition, parking permit rates associated with student housing likely have declined due to shifting preferences among the millennial generation away from automobile ownership.

Stanford proposes to accommodate future demand for parking under the 2018 General Use Permit by carrying over the remaining authorization from the 2000 General Use Permit. Consistent with the 2000 General Use Permit, the total authorized number of spaces would be 21,651 spaces. However, Stanford proposes two changes in approach.

First, Stanford has requested that certain types of parking not count toward the numeric parking limit:

- To support Stanford's transportation demand management efforts, Stanford proposes that spaces used for trip-reducing programs not be counted. Current examples of spaces used for trip-reducing programs include spaces dedicated to rental cars and zip cars.

- To support reduction in greenhouse gas emissions and to recognize that electric vehicle charging stations require turnover such that other spaces are needed for the same cars when they are not charging, Stanford proposes that Electric Vehicle (EV) charging stations not be counted.

- Stanford proposes that spaces dedicated to police or fire department use not be counted. These spaces are not associated with commute trips to and from the campus.

- Stanford proposes that parking for high-density housing to be occupied by faculty and staff not be counted. 2000 General Use Permit Condition H.1 states that "Parking constructed as part of and to serve new faculty/staff housing in the areas designated Campus Residential – Low Density and Campus Residential – Medium Density shall not count toward the limits. ..." Stanford proposes that the high-density faculty/staff housing allowed within the Academic Campus land use designation be subject to this same exemption.

Second, Stanford has requested Santa Clara County approval for a 2,000-space parking supply reserve. This number of spaces is based on applying the current (2015) parking demand rate to the number of student housing units and amount of academic square footage proposed under the 2018 General Use Permit.

Table 5.15-52 shows that Stanford's current parking demand rates result in a total demand for 3,479 net new parking spaces, including a 15% vacancy factor to allow a sufficient number of empty spaces distributed over the campus to prevent unnecessary circulation to locate an available space. Subtraction of the 1,480 spaces anticipated to remain after completion of the academic and academic support facilities and housing authorized by the 2000 General Use Permit results in a remaining forecasted demand for 1,999 spaces.

TABLE 5.15-52
2018 GENERAL USE PERMIT PARKING DEMAND
BASED ON EXISTING PARKING RATES

	Development Proposal	Existing Parking Demand Rates	Number of Spaces
Academic and Support Space	2,275,000 net new square feet	0.94 spaces per 1,000 square feet[a]	2,139
Graduate Student Housing	900 beds	0.55 spaces per bed	495
Undergraduate Student Housing	1,700 beds	0.23 spaces per bed	391
Subtotal			**3,025**
Plus 15% vacancy factor			454
Total Demand			**3,479**

[a] The parking ratio is the estimated commuter and visitor demand from the utilization counts conducted in Fall 2015 (9,025 parking spaces) divided by the academic and support space in Fall 2015 (9,462,000 square feet).

SOURCE: Stanford, 2017

Stanford does not seek initial authorization for this parking supply reserve because Stanford seeks to discourage automobile ownership and use. Stanford intends to continue to expand its TDM programs to meet the No Net New Commute Trips standard, which in turn should reduce demand for both residential and commuter parking permits. However, Stanford recognizes that it may be necessary to provide more parking than it has initially requested if car ownership by campus residents does not continue to decrease over time or if unforeseen circumstances occur.

Stanford has requested that the 2018 General Use Permit allow Stanford to request Planning Commission approval to construct parking spaces in the parking supply reserve under one of three circumstances:

- Stanford is achieving the No Net New Commute Trips standard;
- The proposed additional parking spaces serve a purpose that is not likely to result in a substantial increase in peak hour commute trips (such as visitor and/or residential demand); or
- Unforeseen circumstances occur due to changes in background conditions such as prolonged or permanent disruption of transit service that requires provision of additional parking.

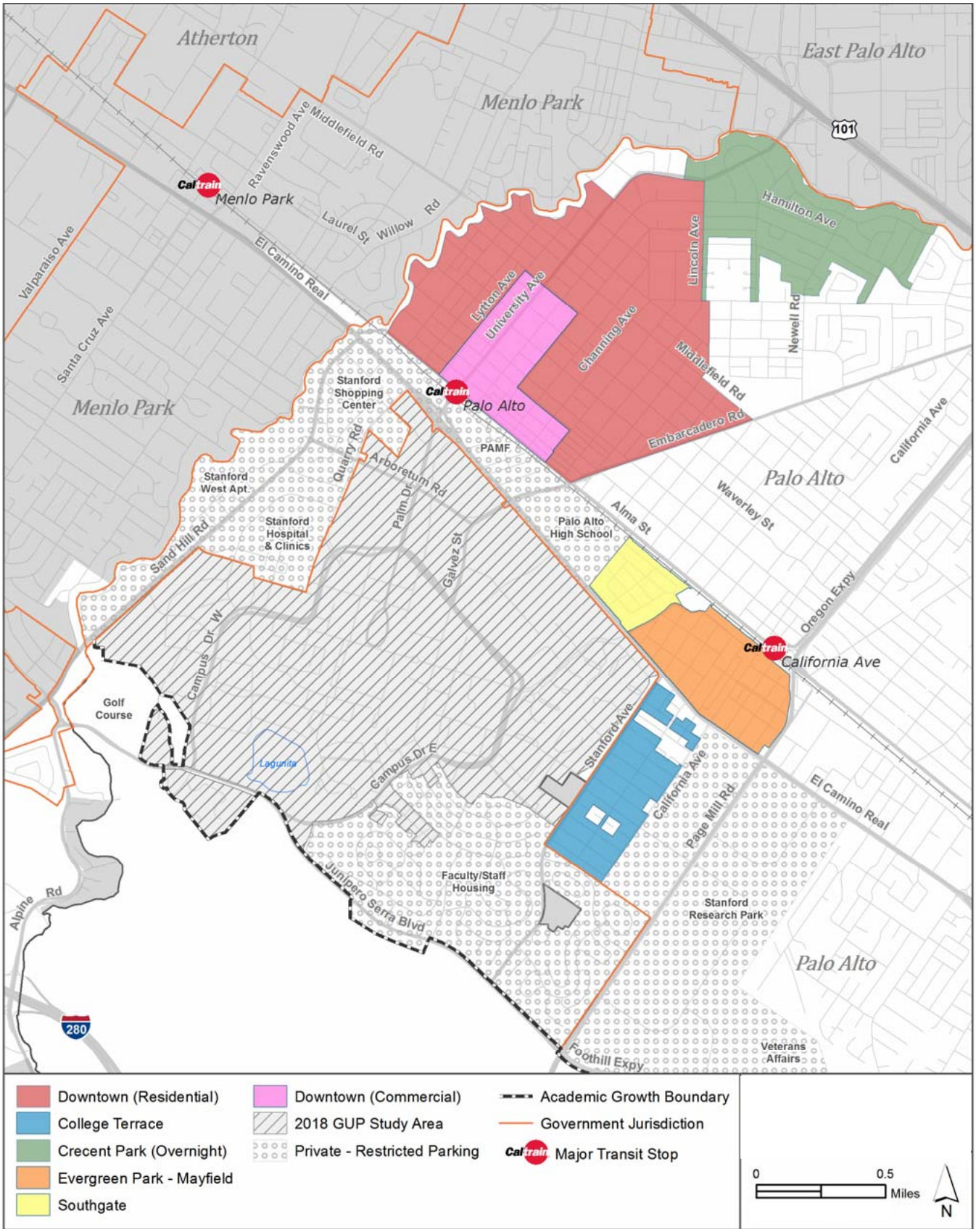
Off-Campus Parking Restrictions

Community outreach for the 2018 General Use Permit generated comments from nearby residents who state that Stanford affiliates may be parking off-campus to avoid the cost of parking on-campus. This section summarizes Palo Alto's current programs to restrict all day parking in the neighborhoods surrounding the campus. It also addresses the concern that Stanford affiliates parking on El Camino Real are avoiding the No Net New Commute Trip standard cordon counts. Based on the geographic extent of existing and planned off-site parking restrictions and observations about the use of parking along El Camino Real, it does not appear that a substantial number of Stanford affiliates will be able to park in nearby neighborhoods under the 2018 General Use Permit or that they will be able to avoid No Net New Commute Trip cordon counts.

Residential Parking Programs

Under the 2000 General Use Permit, Stanford was required as a Condition of Approval to participate in residential parking permit programs in neighborhoods within the City of Palo Alto that are immediately adjacent to the campus. Condition H.2 required Stanford to allocate $100,000 to Palo Alto for consideration and initiation of a residential parking permit program in College Terrace. If there was any remaining money, it could be used to fund a parking study in the Southgate or Evergreen Park neighborhoods. Stanford paid the $100,000 to Palo Alto, who used it for a parking permit program experiment in College Terrace in 2008-2009.

The following summarizes the City of Palo Alto's Residential Parking Permit (RPP) Programs. The location of the parking permit program areas described below are illustrated in **Figure 5.15-21**.



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford, 2017

Figure 5.15-21
Palo Alto Residential Parking Program (RPP) Zones

These programs were initiated in response to increasing concern that non-resident parking in general (not necessarily parking by Stanford affiliates) was affecting the quality of life in Palo Alto. In response, the Palo Alto City Council approved a City-wide Residential Parking Permit (RPP) ordinance to establish uniform procedures to develop RPP districts.

Generally, the programs impose 2-hour daily limits for non-residents. In terms of the residential programs immediately adjacent to Stanford in Palo Alto there are two programs that are in place (Downtown and College Terrace), and two that are in early implementation (Evergreen Park-Mayfield and Southgate). The Crescent Park neighborhood has an overnight parking restriction.

Downtown Palo Alto Residential Preferential Parking. The downtown Palo Alto commercial district has 2-hour on-street parking and 3-hour lot/garage parking restrictions. These time restrictions have caused downtown employee parking to shift into the residential areas surrounding the downtown. To protect the residential neighborhoods, the City passed an ordinance to develop the Downtown Palo Alto RPP program which requires all downtown residents to have a permit to park on the street for more than 2 hours between the hours of 8:00 AM and 5:00 PM, Monday through Friday.

College Terrace Residential Parking Permit Program. The College Terrace RPP program was implemented in 2009 and includes the area generally bounded by Stanford Avenue, Yale Street, California Avenue, and Amherst Street. The RPP allows vehicles displaying a resident permit, guest permit, or day permit, to use on-street parking, Monday through Friday from 8:00 AM to 5:00 PM. The College Terrace RPP covers the majority of the streets in the College Terrace neighborhood other than a few short block on Dartmouth Street and some multifamily areas on Williams Street.

Evergreen Park – Mayfield RPP. The Evergreen Park- Mayfield RPP area is located adjacent to South Gate and generally bounded by Park Avenue, El Camino Real, Page Mill Road and the Caltrain railroad tracks. The RPP was initiated as a one-year pilot in April 2017, and restricts parking by persons without a permit to a 2-hour time limit between 8:00 AM and 5:00 PM. Like in the Downtown RPP, permits are available to all residents and to a limited number of employees. And like the Downtown RPP, the Evergreen Park-Mayfield RPP is only enforced on the weekdays, during working hours.

Southgate RPP. The Southgate neighborhood began its process for an RPP in July 2016. Council approved Southgate RPP in June 2017 and it is expected to take effect in October 2017. The Southgate RPP includes the area generally bounded by Churchill Avenue, El Camino Real, Park Avenue, and the Caltrain railroad tracks. The parking concern is from spill over from Palo Alto High School. The community is considering implementing a 1-hour time restriction on school days for non-permit holders, similar to what is enforced near Gunn High School. A time period of 9:00 AM to 1:00 PM is being considered.

Crescent Park No Overnight Parking. The Crescent Park No Overnight Parking program was initiated in September 2015 as a response to resident concerns about non-Palo Alto residents parking within the neighborhood. A no-overnight restriction was implemented to eliminate parking from outside sources. The Crescent Park RPP includes the area generally bounded by

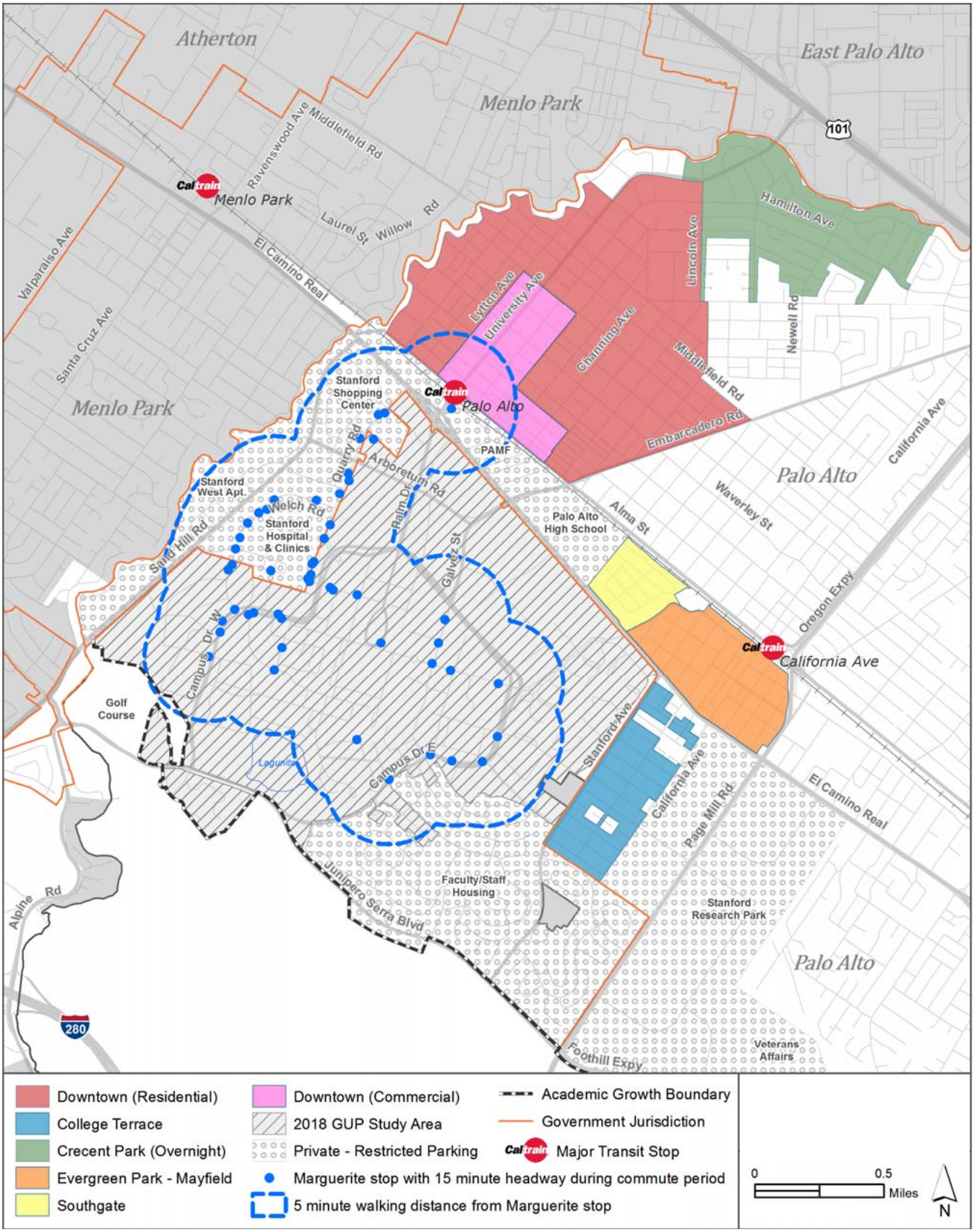
San Francisquito Creek, Lincoln Avenue, Channing Avenue, and Rhodes Drive. The Crescent Park No Overnight Parking program restricts parking by non-residents during the hours of 2:00 AM to 5:00 AM.

Stanford Affiliates Parking Off-Campus

Some community members have posited that Stanford affiliates could be parking in the community and either walking or taking a Marguerite shuttle to campus. **Figure 5.15-22** presents the parking permit areas with a 5-minute walkshed around those Marguerite shuttle stops that are served by a shuttle with 15 minutes headways or less during the morning and evening peak commute periods. As illustrated, the RPP areas cover the neighborhoods where accessing a Marguerite stop would be most likely to occur. The RPPs are expected to prevent parking in these neighborhoods; anecdotal observations to the contrary may pre-date initiation of the RPPs. Substantial amounts of Stanford-affiliate parking in neighborhoods near shuttle routes with longer commute period headways also is unlikely to occur.

While there is no way to control the individual behavior of each of member of its community, Stanford reports that it makes a number of efforts to minimize this occurrence. When members of the Stanford community join the Commute Club, a program that pays employees to forgo parking on campus in favor of taking alternative transit options, the Stanford affiliates must sign an agreement that says that they will not park in the surrounding community. When violations occur, Stanford removes the employee from the Commute Club and works with the local jurisdiction to identify the responsible party and take action to remedy the situation. Further, when employees are reported to be parking off-site in the surrounding community, their department heads are made aware, so they can directly address the problem and curtail it.

There is not an abundance of on-street parking that is not time restricted adjacent to the campus. The exception is along El Camino Real between Encinal Avenue and Stanford Avenue. The on-street parking occupies both the Stanford and the Palo Alto side of El Camino Real, and extends south to Grant Avenue. There are approximately 150 parking spaces on the Stanford side of El Camino Real fronting the Stanford campus. These on-street spaces are essentially filled before the traditional peak hour of 8:00-9:00 AM. Thus, drivers using these spaces are not traveling during the peak hour, and therefore are not parking in this location to avoid cordon counts.



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford, 2017

Figure 5.15-22

Average 5 Minute Walking Distance from Marguerite Shuttle Stops

5.15.9 References

City/County Association of Governments of San Mateo County (C/CAG), *2015 San Mateo County Congestion Management Program*, November 2015.

C/CAG, *San Mateo County Comprehensive Bicycle and Pedestrian Plan*, September 2011.

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5.16 Utilities and Service Systems

5.16.1 Introduction

This section evaluates potential environmental effects associated with implementation of the proposed 2018 General Use Permit on utilities and service systems, including water supply and conveyance, wastewater conveyance and treatment, and solid waste disposal. The section includes a description of the existing and 2018 baseline environmental settings, criteria used to determine impact significance, a discussion of potential impacts to utilities and service systems; and identifies regulatory mechanisms and/or potentially feasible mitigation measures, as necessary, to reduce potential significant impacts.

The section relies in part on reports prepared by Stanford in support of its 2018 General Use Permit application, and independently peer reviewed by ESA: a Water Supply Assessment (WSA) prepared by Schaaf & Wheeler Consulting Civil Engineers (see Appendix WSA), and a Background Conditions Report (see Appendix BCR). In addition, the section relies on utility related reports available from the City of Palo Alto with regard to wastewater and solid waste services, as well as information available from Stanford's Water Resources and Civil Infrastructure Group (WRCI Group).

Please also see Section 5.9, Hydrology and Water Quality, which addresses stormwater, water quality, groundwater supplies and recharge, runoff and erosion, detention capacity and flooding hazards. Though, elements of these topics are incorporated in this section by reference where relevant.

5.16.2 Existing Environmental Setting

Water Services

Stanford receives its water from three sources: 1) water purchased wholesale from the San Francisco Public Utilities Commission (SFPUC), 2) local surface water supplies, and 3) groundwater.

Stanford's water infrastructure is made up of a network of supplies, storage and distribution facilities for domestic (potable), and non-potable sources. Specific components of Stanford's water service system include wells, reservoirs, pump stations, and creek diversion facilities, in addition to pipe networks. These water systems are managed by Stanford's WRCI Group within the Department of Sustainability and Energy Management (SEM).

SFPUC Water

Stanford receives the majority of its total water, and the entirety of its potable water, as a wholesale purchase from the SFPUC, which provides most of the potable water to the City of

San Francisco and 28 other agencies in the Bay Area.[1] SFPUC's water supply consists primarily of diverted Tuolumne River flows conveyed through the Hetch Hetchy Project (approximately 85 percent of supply), with local sources making up the remaining 15 percent (Appendix WSA). Stanford's domestic water supply has multiple connections to this system.

The SFPUC provides water to its wholesale customers under the terms of a 2009 Water Supply Agreement. Under this Agreement, Stanford holds a long-term "Individual Supply Guarantee" (ISG) of 3.03 million gallons per day (mgd) overall annual average, which represents approximately 1.6 percent of SFPUC's total wholesale deliveries. The 2009 Agreement also contains an "Interim Supply Limitation" (ISL) allocation of 2.91 mgd for Stanford in effect until 2018.Thus, Stanford holds an allocation from the SFPUC of 2.91 mgd until 2018, and an allocation of 3.03 mgd thereafter.[2] The 2009 Agreement has a 25-year term (through 2034), however, the SFPUC's 2015 Urban Water Management Plan (UWMP) assumes that the amount that is allocated to wholesalers (including Stanford) under the Agreement will continue through the year 2040.

Between fiscal year (FY) 2010/11 and 2015/16, Stanford's daily domestic water use was approximately 1.96 mgd, fluctuating between a low of 1.39 mgd in FY 2015/16 and a high of 2.16 mgd in FY 2011/12 (Appendix WSA). Reduced water demands in FY 2014/15 and FY 2015/16 are reflective of reduced water use as a result implementation of the Stanford Energy System Innovations (SESI) project, and additional mandatory conservations (beyond Stanford's typical water conservation program) in response to the recent drought (Appendix WSA). See also description of Stanford's water conservation efforts, below.

Surface Water

As described in Section 5.9, Hydrology and Water Quality, Subsection Local Surface Water, the Project site is located within the San Francisquito Creek and Matadero Creek watersheds. Stanford holds a combination of riparian rights, and pre-1914 appropriative rights reported under four Statements of Water Diversion and Use, and one appropriative right licensed by the SWRCB within these watersheds that support Stanford's surface water diversion. These rights provide water for landscape irrigation, stockwatering, recreation, fire protection, and habitat purposes.

The non-potable water system, consisting of diversion structures, reservoirs, pump stations and pipelines, is referred to as Stanford's Lake water system, and is illustrated in **Figure 5.9-2**. Diverted surface water supplies Stanford's non-potable Lake water system via seasonal storage (during periods of high flow). Surface water diversion occurs in three locations: in Los Trancos Creek located at the south end of the Project site where Creek water is directed to Felt Reservoir; in San Francisquito Creek near the Stanford Golf Course where water is pumped to either Felt Reservoir or Lagunita; and at Searsville Reservoir located upstream of the Project site where water is pumped to the campus. Lake water is not treated to meet domestic water quality

[1] The SFPUC acts as a "public water system" with respect to its retail customers in the City and County of San Francisco, but it does not serve as a "public water agency" when it provides water to its wholesale customers such as Stanford, who are responsible for supplying water to the ultimate end users.

[2] Note that although expressed in units of mgd, both the ISG and ISL are overall annual average targets. Daily or monthly usage may exceed these targets, and this is not uncommon during the summer months.

standards. However, if needed in the case of an emergency, Stanford Lake water can be treated to domestic standards, and made available for potable use.

Together, Stanford's rights to diverted surface waters can yield over 1,250 acre-feet per year (AFY) (or 1.12 mgd) to the Lake water system. Between calendar year 2010 and 2015, Stanford's annual average surface water diversion was 704 acre-feet, fluctuating between a low of 85 acre-feet in 2015 and a high of approximately 1,005 acre-feet in 2012[3] (Appendix WSA).

Groundwater

Stanford pumps groundwater into its Lake water system primarily to supplement its non-potable landscape irrigation system; groundwater is relied upon for landscape irrigation most heavily during dry years. Groundwater is also pumped into the Lake water system if needed to provide supplemental water to maintain the water level in Lagunita reservoir for the benefit of the California tiger salamander and also to provide groundwater recharge. Stanford can also treat and pump groundwater into the domestic water system, but only does so in the event of an emergency or other operational need.

These wells withdraw groundwater from the San Francisquito Cone, a region of the Santa Clara Valley Groundwater Basin. The Santa Clara Valley Water District (SCVWD) oversees groundwater resources within the County.

Stanford's wells currently have a combined total pumping capacity of approximately 4,450 acre-feet per year (AFY). Stanford can withdraw up to 1,700 AFY (1.52 mgd) from its wells without adversely affecting groundwater conditions. Between calendar year 2010 and 2015, Stanford's annual average groundwater use was 584 acre-feet, fluctuating between a low of 127 acre-feet in 2011 and a peak of 1,359 acre-feet in 2014[4] (Appendix WSA).

As discussed further in Section 5.9, Hydrology and Water Quality, the Santa Clara Valley groundwater basin is not identified as an overdrafted basin by the Department of Water Resources (DWR), is not projected to enter a state of overdraft, and has not been adjudicated. See Section 5.9, Hydrology and Water Quality, for additional detail.

Water Conservation and Recycled Water

Between 2000 and 2015, Stanford decreased its potable water use by 30 percent through a comprehensive program to identify and implement water conservation measures and through replacement of the campus-wide heating and cooling system.[5] Stanford developed a Water

[3] The amount of Stanford's surface water diversion, and relatedly, groundwater use, can differ substantially from year to year. Both the quantity and timing of wet-season rainfall are highly variable, directly affecting both surface water availability and plant irrigation needs. During wet years, Stanford diverts more surface water from local streams, when plant irrigation needs are less than average, particularly if the rainy season extends into the fall or spring. In wet years, Stanford might meet most irrigation needs with surface water, relying very little on groundwater. In drier years, plants require more irrigation, and streamflows may be too low for Stanford to meet these demands with surface water; so Stanford pumps additional groundwater to meet its landscape irrigation needs (Appendix WSA).

[4] Ibid.

[5] 2.73 million gallons a day (mgd) in 2000/2001 to 1.89 mgd in 2014/2015.

Conservation, Reuse and Recycling Master Plan in 2001, and is currently developing a Sustainable Water Management Plan to guide its long-term water supply development, water conservation, wastewater and storm-water management, and habitat conservation programs. Stanford also implements a Water Efficiency Program to decrease domestic water and improve water efficiency at the campus.

In addition, many buildings on campus are equipped to use recycled water for toilet flushing with the use of "dual plumbing" using "purple pipe;" examples of existing dual plumbed buildings include the Science and Engineering Quad, School of Medicine, and the Knight Management Center complex. While Stanford's recycled water system is currently fed by domestic water, as new sources of recycled water emerge, Stanford anticipates that the dual plumbed buildings will be among the first to implement recycled water use (Stanford, 2017e).

Wastewater

Collection System

Wastewater generated by Stanford is collected in its sanitary sewer system and then conveyed off-site to and through City of Palo Alto sewer lines to the City of Palo Alto-owned and -operated Harold L. May Regional Wastewater Quality Control Plant (RWQCP), located on the north side of the city, where it is treated. The Stanford campus sanitary sewer system consists of 43 miles of pipe and is owned by Stanford and managed by its WRCI Group. The City of Palo Alto Utilities Department (CPAU) oversees the City's wastewater collection system.

Stanford sanitary sewer flow discharges to the City main that runs parallel to El Camino Real. This main is 21 inches in diameter and has a calculated maximum flow capacity of approximately 4,370 gallons per minute (gpm). Stanford's measured daily dry weather peak flows to this sewer main in 2016 ranged between 1,000-1,700, gpm dependent on the time of year (Stanford, 2017h).

Wastewater Treatment

The RWQCP is a Class V advanced secondary treatment facility featuring primary treatment, secondary treatment, and filtration and disinfection treatment. The RWQCP is funded by and serves six partners: Palo Alto, Stanford, Mountain View, East Palo Alto Sanitary District, Los Altos, and Los Altos Hills. Approximately 220,000 people live in the RWQCP service area, and about 60 percent of the wastewater generated in this service area is from residences, 10 percent from industries, and 30 percent from commercial businesses and institutions. The Palo Alto Public Works Department is responsible for treatment of sewage at the RWQCP (City of Palo Alto, 2016).

The RWQCP removes approximately 99 percent of ammonia, organic pollutants, and solid pollutants from the wastewater, and the quality of the water leaving the plant approaches the standards for drinking water (City of Palo Alto, 2016). The RWQCP discharges treated effluent to the San Francisco Bay. The City, serving as discharger, operates under an NPDES permit to discharge treated wastewater to the Bay. The NPDES permit requires the City to evaluate its local limits, such as those established by the other entities contributing to the RWQCP, to ensure

compliance with updated effluent limits. The RWQCP is required to monitor the permitted discharges into the collection system in order to evaluate compliance with the RWQCP's permit conditions (see Regulatory Description below, also).

The RWQCP is designed to have an average dry weather flow (ADWF) capacity of 39 mgd and an average wet weather flow capacity of 80 mgd (City of Palo Alto, 2016). The RWQCP treated 21 mgd of effluent from all the partner agencies before the drought (2012-2013), and just under 18 mgd in the July 2015-June 2016 plant fiscal year (City of Palo Alto, 2016; Stanford, 2017h).

The City of Palo Alto indicates the RWQCP does not experience any major treatment system constraints and capacity is sufficient for current dry and wet weather loads and for future load projections (City of Palo Alto, 2016).

Stanford Wastewater Discharge

The City of Palo Alto reports that Stanford's average daily sewer discharge is 1.1 mgd, about 2.8 percent of the RWQCP's total ADWF capacity (Stanford, 2017h).[6] Stanford owns capacity in the RWQCP of up to 2.11 mgd ADWF, just over 5 percent of the plant's capacity.

Stanford has separate sanitary sewer and stormwater systems. Therefore, any increases in sanitary sewer flow during wet weather days are minimal, and are related to infiltration and inflow, and not conveyed storm drainage flows.

Solid Waste

Waste Management

In 2016, unincorporated areas of Santa Clara County generated solid waste which was directed to 22 different landfills (CalRecycle, 2017a). Solid waste generated at the Project site is managed exclusively by Peninsula Sanitary Service, Inc. (PSSI), which has partnered with Stanford for over 50 years to provide recycling, composting, and solid waste management services. PSSI operates all collection services at the Project site, including the collection, processing, and/or marketing of recyclables, food and compostable materials, and trash. PSSI provides dumpster and roll-off debris box service; provides recycling and composting bins for campus buildings, and recycling, compost and landfill bins for special events; collects construction and demolition material; and provides street sweeping services. PSSI operates the Stanford's Recycling Drop-Off Center at 70 Serra Street. PSSI also provides community education and trainings for how to reduce waste, and promote increased reuse, recycling, and composting at the campus (Stanford, 2017f, g). PSSI delivers solid waste from the Project site to the Newby Island Sanitary Landfill, the Zanker Road Class III Landfill, or Sims Metal Management (PSSI, 2017).

PSSI generally delivers residential landfill waste collected at the Project site to the 342-acre Newby Island Sanitary Landfill located in Milpitas, California. This landfill has a capacity of

[6] Actual metered sanitary sewer flows between 2010 and 2016 at Stanford ranged from approximately 0.5 mgd to 1.6 mgd, as flows vary based on activities, and whether students are on campus.

57.5 million cubic yard, and is permitted to collect the following waste categories: construction/demolition, industrial, mixed municipal, sludge (biosolids), tires, green materials, and contaminated soil at a maximum permitted throughput of 4,000 tons per day. As of October 2014, this landfill had a remaining capacity of 21.2 million cubic yards, with an anticipated cease operation date of January 2041 (CalRecycle, 2017b).

PSSI generally delivers construction and demolition-related waste generated at the Project site to the 70-acre Zanker Road Class III Landfill in San Jose, California. As of 2012, the Zanker Road Landfill had a total remaining capacity of 700,000 cubic yards in two units that collectively process construction and demolition waste, green materials, and industrial waste, with an expected closure date of 2029. Overall the facility has maximum throughput of 2,600 tons per day (landfill tonnage is limited to 300 tons per day, compost at 400 tons per day, with the remaining amount permitted recyclables) (CalRecycle, 2012). As of 2017, the facility recorded throughput at 1,500 tons per day (CalRecycle, 2017c).

PSSI generally delivers recyclable metal collected at the Project site to Sims Metal Management in Redwood City. Sims is a scrap metal yard, which purchases and processes ferrous scrap metal with an onsite shredder and logistics to support off-site shipment (Sims, 2017).

Waste Generation

Over the last 30 years, the Stanford's Waste Reduction, Reuse, Recycling and Composting program has been expanded and improved in response to demands from the campus community, recycling markets and new legislation. Stanford has increased its landfill diversion rate from 39 percent in 1998 to 64 percent in 2016. In 2016 Stanford generated a total of 24,685 tons of solid waste, of which 8,945 tons were sorted as landfilled waste and 15,740 tons were diverted through recycling and reduction.[7] In FY 2015-16 this represents a total discard generation rate of 0.74 tons per person per year. This included landfill waste at a generation rate of 0.27 tons per person per year and recycled waste at a generation rate of 0.47 tons per person per year (Stanford, 2017i). The solid waste total includes all demolition and construction waste, which in 2016, accounted for nearly 4,100 tons or approximately 16 percent of total waste (Stanford, 2017j).

5.16.3 2018 Baseline Environmental Setting

As discussed in Chapter 5, Introduction to Environmental Analysis, the proposed 2018 General Use Permit is not anticipated to be considered by the County for approval until 2018, after which implementation would commence. As a result, 2018 serves as the baseline year against which environmental impacts of the proposed Project are evaluated.

Also as discussed in Section 5.0, Stanford estimates that nearly all remaining academic and academic support development, and remaining housing, authorized under the 2000 General Use Permit will be built and occupied at the time of approval of the 2018 General Use Permit. The notable exception is the planned Escondido Village (EV) Graduate Residences, which are

[7] Based on an estimated Stanford on-campus and affiliated commuter population.

currently under construction; this housing is not expected to be completed and occupied until approximately 2020.

The incremental increase in academic, academic support and student housing, and the associated increase in on-campus population, would result in a proportional increase in potable and non-potable water demand and distribution. It would also result in a proportional increase in wastewater and solid waste generation at the Project site, which would result in a correlating incremental increase in conveyance of wastewater off-site for treatment; and disposal of solid waste off-site, by Fall 2018.

As discussed above, with respect to potable water, Stanford's water supply allocation from SFPUC will increase slightly from 2.91 to 3.03 mgd in 2018, when the ISL expires and the ISG is reinstated. No substantial change in RWQCP treatment capacity or off-site landfill capacity would occur between the existing environmental setting and the 2018 environmental baseline. Consequently, apart from these changes noted, the conditions described above for the existing environmental setting are also largely representative of the 2018 environmental baseline as it relates to utilities and service systems.

5.16.4 Regulatory Setting

Federal Regulations

Clean Water Act

Please see Section 5.9, Hydrology and Water Quality.

Federal Safe Drinking Water Act

The U.S. Environmental Protection Agency (USEPA) administers the Safe Drinking Water Act (SDWA), the primary federal law that regulates the quality of drinking water and establishes standards to protect public health and safety. The California Department of Health Services (DHS) implements the SDWA and oversees public water system quality statewide. DHS establishes legal drinking water standards for contaminates that could threaten public health.

National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program under the CWA controls water pollution by regulating point and nonpoint sources that discharge pollutants into "waters of the U.S." California has an approved State NPDES program. The San Francisco Bay Regional Water Quality Board (RWQCB) regulates water quality in the Project site and surroundings. Under this system, municipal and industrial facilities are required to obtain an NPDES permit that specifies allowable limits, based on available wastewater treatment technologies, for pollutant levels in their effluent. Specific industries and public facilities, including wastewater treatment plants, that have direct stormwater discharges to navigable waters, are also required to obtain either an individual permit or obtain coverage under the statewide General Industrial Stormwater Permit.

Operation of the Palo Alto RWQCP and its wastewater collection system is regulated by Waste Discharge Requirements (WDRs; NPDES No. CA0037834), found in Regional Water Quality Control Board (RWQCB) Order No. R2-2014-0024, effective August 1, 2014, and expiring July 31, 2019. The effluent from the RWQCP also is subject to two other NPDES permits: 1) the WDRs for mercury and polychlorinated biphenyls (PCBs) from municipal and industrial wastewater discharges to San Francisco Bay (NPDES No. CA0038849); and 2) waste discharge requirements for nutrients from municipal wastewater discharges to San Francisco Bay (NPDES No. CA0038873). The three NPDES permits enable Palo Alto to discharge treated wastewater into San Francisco Bay and Matadero Creek (City of Palo Alto, 2016).

See also Section 5.9, Hydrology and Water Quality for additional discussion.

State Regulations

California Porter-Cologne Water Quality Control Act

Please see Section 5.9, Hydrology and Water Quality.

Water Quality Control Plan for the San Francisco Region (Basin Plan)

Please see Section 5.9, Hydrology and Water Quality.

California Safe Drinking Water Quality Act

Effective in July 2014, the California Safe Drinking Water Act strengthens the federal Safe Drinking Water Act by authorizing the State's Department of Health Services to protect the public from contaminants in drinking water by establishing maximum contaminants levels (MCLs) that are at least as stringent as those developed by the U.S. EPA.

Senate Bill 610

Senate Bill 610 (SB 610) precludes projects from being approved without specific evaluations being performed and documented by the local water provider that indicate that water is available to serve the project. The provisions of SB 610 amend the Water Code sections 10910 through 10915.

SB 610 requires the preparation of a Water Supply Assessment (WSA) for certain large-scale development projects.[8] The WSA evaluates the water supply available for new development based on anticipated demand. The Water Code Section 10910(b) indicates that if a county determines that a project that is subject to this law requires an EIR, and if there is no identified public water system that may serve the project, then the county, as lead agency for the project,

[8] All projects that meet any of the following criteria require a WSA: 1) a proposed residential development of more than 500 dwelling units; 2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 ft^2 of floor space; 3) a proposed commercial office building employing more than 1,000 persons or having more than 250,000 ft^2 of floor space; 4) a proposed hotel or motel, or both, having more than 500 rooms; 5) a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; 6) a mixed-use project that includes one or more of the projects specified in this subdivision; or 7) a project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

shall prepare the WSA. In such case, Water Code Section 10910(c)(4) indicates the WSA for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

California Urban Water Management Planning Act

Through the Urban Water Management Planning Act of 1983, certain urban water suppliers within California must prepare and adopt a UWMP and update it every five years. The Act is intended to support conservation and efficient use of urban water supplies at the local level. The Act requires that total projected water use be compared to water supply sources over the next 20 years in five-year increments, that planning occur for single and multiple dry water years, and that plans include a water recycling analysis that incorporates a description of the wastewater collection and treatment system within the agency's service area along with current and potential recycled water uses. In September 2014 the Act was amended by SB 1420 to require urban water suppliers to provide descriptions of their water demand management measures and similar information.

California Water Conservation Act

The Water Conservation Act of 2009 (SBx7-7) requires each urban water supplier to select one of four water conservation targets contained in California Water Code Section 10608.20 with the statewide goal of achieving a 20 percent reduction in urban per-capita water use by 2020.

Water Conservation in Landscaping Act of 2006

In September 2009 the State adopted Assembly Bill 1881 (AB 1881), the Water Conservation in Landscaping Act of 2006, which directs local governments to require the use of low-flow plumbing fixtures and the installation of drought-tolerant landscaping in all new development. As of January 2010, all jurisdictions were required to implement this law.

CALGreen Building Code

The California Code of Regulations (CCR) Title 24, Part 11, or the California Green Building Standards Code (CALGreen), is designed to reduce impacts by providing guidelines and requirements on the following categories; planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and, environmental quality.

With regards to solid waste, CALGreen requires that at least 50 percent of weight of non-hazardous job site debris generated by new construction be recycled, reused, or otherwise diverted from landfill disposal. CalGreen requires submission of plans and verifiable post-project documentation to demonstrate compliance.

Assembly Bill 939 and Senate Bill 1016

The California Integrated Waste Management Act of 1989, or Assembly Bill 939 (AB 939), established the Integrated Waste Management Board, required the implementation of integrated waste management plans, and mandated that local jurisdictions divert at least 50 percent of all solid waste generated (from 1990 levels), beginning January 1, 2000, and divert at least 75 percent by 2010. Projects that would have an adverse effect on waste diversion goals are required to include waste diversion mitigation measures to assist in reducing these impacts to less-than-significant levels. With the passage of Senate Bill 1016 (SB 1016, the Per Capita Disposal Measurement System) in 2006, only per capita disposal rates are measured to determine if a jurisdiction's efforts are meeting the intent of AB 939.

Public Resources Code Section 41780

The California State Legislature set the policy goal for the state that not less than 75 percent of solid waste generated be source reduced, recycled or composted by the year 2020. Furthermore, a 50 percent diversion rate will be enforced for local jurisdictions.

Assembly Bill 341

In an effort to reduce greenhouse gas emissions from disposing of recyclables in landfills, AB 341 requires local jurisdictions to implement commercial solid waste recycling programs. Businesses that generate four cubic yards or more of solid waste per week or multifamily dwellings of five units or more must arrange for recycling services. In order to comply with AB 341, jurisdictions' commercial recycling programs must include education, outreach and monitoring of commercial waste generators and report on the process to CalRecycle. Jurisdictions may enact mandatory commercial recycling ordinances to outline how the goals of AB 341 will be reached. For businesses to comply with AB 341, they must arrange for recyclables collection through self-haul, subscribing to franchised haulers for collection, or subscribing to a recycling service that may include mixed waste processing that yields diversion results comparable source separation.

Assembly Bill 1826

In order to further reduce greenhouse gas emissions from disposing of organics materials in landfills, AB 1826 requires businesses to recycle their organic waste beginning on April 1, 2016, depending on the amount of solid waste they generate per week. Similar to AB 341, jurisdictions are required to implement an organic waste recycling program that includes the education, outreach and monitoring of businesses that must comply. Organic waste refers to food waste, green waste, landscaping and pruning waste, nonhazardous wood waste, and food-soiled paper that is mixed with food waste.

County of Santa Clara

Santa Clara County General Plan

Utility and service system policies relating to the proposed Project are contained in the Santa Clara County General Plan, and are most concentrated in the chapters on Resource Conservation and Safety and Noise. The Santa Clara County General Plan Resource Conservation and Health

and Safety chapters contain strategies and policies relevant to water supply and solid waste management and wastewater disposal. The General Plan also includes policies relevant to water quality and watershed management, though the Stanford Community Plan provides more campus specific requirements, these are addressed under Section 5.9 Hydrology and Water Quality. The General Plan strategies and policies relevant to utilities and service systems at Stanford include:

Resource Conservation

Water Supply Resources

Policy C-RC 5 – An adequate, high quality water supply for Santa Clara County should be considered essential to the needs of households, business and industry.

Policy C-RC 6 –A comprehensive strategy for meeting long term projected demand for water should at a minimum include the following:

a. Continued conservation and increased reclamation;
b. Securing additional sources as supplemental supply;
c. System and local storage capacity improvements; and
d. Drought contingency planning and groundwater basin management programs.

Policy C-RC 7 – Countywide land use and growth management planning should be coordinated with overall water supply planning by the SCVWD in order to maximize dependability of long term water supply resources.

Policy C-RC 8 – Environmental impacts of all state and local water supply planning and decision-making should be taken into full consideration.

Strategy #1: Conserve and Reclaim Water

Policy C-RC 9 – Conservation should continue to be considered an integral component of local water "supply" resources, effectively minimizing the amount of supplemental supplies which must be obtained from other sources.

Policy C-RC 10 – Educational measures should be continued/increased in order inform the public of the need for conservation over the long term, rather than as a temporary response to periodic drought.

Policy C-RC 11 – Domestic conservation should be encouraged throughout Santa Clara County by a variety of means, including reduced flow devices, drought-resistant landscaping, and elimination of wasteful practices.

Policy C-RC 12 – More efficient use of water for agricultural irrigation and industrial processes should be promoted through improved technology and practices.

Policy C-RC 13 – Use of reclaimed wastewater for landscaping and other uses, including groundwater recharge if adequately treated, should be encouraged and developed to the maximum extent possible.

Strategy #2: Obtain Additional Imported Water Sources

Policy C-RC 14 – Reforms of the state-wide system of water allocation and distribution should be encouraged which facilitate the ability of urban area water suppliers to purchase needed supplies through market mechanisms.

Strategy #3: Make System and Local Storage Capacity Improvements

Policy C-RC 15 – Potential for new and/or expanded local reservoirs should be thoroughly examined as a part of any long term strategy for assuring adequate water supply, taking into full account environmental and financial feasibility.

Policy C-RC 16 – Seismic safety considerations for new and existing reservoirs should be addressed in order to ensure water supply and public safety in the event of earthquake.

Strategy #4: Maintain Drought Contingency and Groundwater Basin Management Plans

Policy C-RC 17 – Drought contingency plans and groundwater basin management programs should be reviewed and updated to prepare for the likelihood of future periods of short-term drought and to minimize:

a. the potential adverse impacts of drought upon households, business, and industry, and
b. the possibility of groundwater overdraft and land subsidence.

Solid Waste Management

Policy C-RC 63 – Santa Clara County shall strive to reduce the quantity of solid waste disposed of in landfills and to achieve or surpass the requirements of state law (the law currently specifies 25 percent reduction of landfilled wastes by 1995, and 50 percent by 2000).

Policy C-RC 64 – Countywide solid waste management efforts shall be guided by the hierarchy of strategies outlined below, emphasizing resource recovery in accordance with state law:

a. Source reduction and reuse,
b. Recycling and composting,
c. Transformation, and
d. Landfilling as final option.

Policy C-RC 65 – All solid waste management services and facilities shall conform to applicable federal, state, and local regulations and standards.

Strategy #1: Encourage Source Reduction and Reuse

Policy C-RC 66 – Santa Clara County shall seek innovative and effective means of reducing the primary components of solid waste generated by homes and businesses, including but not limited to such efforts as reducing waste paper, junk mail, unnecessary product containers, and yard waste.

Implementation Recommendations:

C-RC(i)39 – Explore how to implement innovative source reduction and reuse strategies that have proven successful in other jurisdictions (e.g.: neighborhood centers for reuse of construction materials).

Strategy #2: Facilitate Recycling and Promote Composting Strategy

Policy C-RC 67 – Adequate solid waste collection and recycling services shall be provided to all county residents. Recycling services for all commercial and industrial establishments shall be evaluated and expanded wherever feasible.

Policy C-RC 68 – Santa Clara County shall consider efforts to increase markets for goods produced from recycled/reused materials as an essential feature of all efforts to manage solid waste and conserve landfill capacity and shall include such considerations in policies regarding acquisition of materials, equipment, and facilities.

Policy C-RC 70 – Neighborhood and community composting centers should be explored and evaluated for purposes of reducing landfilled yard waste.

Strategy #3: Explore Transformation Opportunities Strategy

Policy C-RC 71 – Potential applications for waste transformation and energy generation technologies should be explored and encouraged.

Strategy #4: Plan for Adequate Landfill Capacity

Policy C-RC 72 – Decision-making regarding the siting of new landfills, the expansion of existing sites, and the location of other solid waste management facilities shall balance the need for such facilities with the full range of environmental quality issues involved.

Policy C-RC 73 – Santa Clara County acknowledges the need for long term disposal capacity and will strive to maintain 20 to 30 years of ongoing collective disposal capacity.

Policy C-RC 74 – Expansion of existing landfill sites should be encouraged and explored thoroughly in preference to siting new landfills.

Implementation Recommendations:

C-RC(i) 40 – Implement countywide public education efforts to support local recycling and waste reduction programs.

C-RC(i) 41 – Implement countywide programs to support the development and implementation of recycling programs in commercial/industrial facilities.

C-RC(i) 42 – Support legislative and other measures to develop markets for recyclable materials.

Health and Safety

Waste Water Disposal

Strategy #1: Prevent Waste Water Contamination of Groundwater Supplies

Policy C-HS 42 – The long-term viability and safety of underground aquifers and groundwater systems countywide shall be protected to highest degree feasible.

Policy C-HS 46 – Hazardous materials, whether commercial, industrial, agricultural, or residential in character, should not be disposed of in any wastewater or on-site wastewater treatment system.

Stanford Community Plan

The Stanford Community Plan is a component of the Santa Clara County General Plan and refines the goals, strategies, and policies for Stanford lands in unincorporated Santa Clara County. The Stanford Community Plan regards the Santa Clara County General Plan's treatment of water supply, solid waste and wastewater as adequate, and does not provide more specific detail.

Local Jurisdictions

The Bay Area Water Supply and Conservation Agency

The Bay Area Water Supply and Conservation Agency (BAWSCA) was enabled by AB 2058 and was created in 2003 to represent the interests of 24 cities and water districts, and two private utilities, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System. BAWSCA is governed by a 26-member Board of Directors comprised of respected community leaders representing the 24 cities and water districts that are member agencies of BAWSCA, and two private utilities that also have appointees to the board, Stanford and California Water Service Company.

BAWSCA is the only entity having the authority to directly represent the needs of the cities, water districts and private utilities (wholesale customers) that depend on the regional water system. BAWSCA provides the ability for the customers of the regional system to work with San Francisco on an equal basis to ensure the water system gets fixed, and to collectively and efficiently meet local responsibilities.

BAWSCA is developing the Long-Term Reliable Water Supply Strategy to quantify the water supply reliability needs of the BAWSCA member agencies through 2040, identify the water supply management projects and/or programs (projects) that could be developed to meet those regional water reliability needs, and develop an implementation plan for the Strategy. In February 2015, BAWSCA published the Long-Term Reliable Water Supply Strategy Phase II Final Report. The Phase II Final Report identifies water management actions that provide long-term water supply reliability for the region. For the Phase II Final Report, BAWSCA performed an assessment of the regional water supply reliability needs through the year 2040, evaluated potential water supply reliability projects that could be implemented to meet these needs, and identified actions to achieve increased regional reliability.

5.16.5 Impacts and Mitigation Measures

Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on utilities and service systems if it would:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

c) Not have sufficient water supplies available to serve the project from existing entitlements and resources, such that new or expanded entitlements would be needed;

d) Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;

e) Be served by landfills without sufficient permitted capacity to accommodate the project's solid waste disposal needs; or

f) Fail to comply with federal, state, and local statutes and regulations related to solid waste.

Approach to Analysis

Water Supply

A Water Supply Assessment (WSA) was prepared for the 2018 General Use Permit (see Appendix WSA) pursuant to the requirements of Senate Bill 610, which requires a WSA for any "project" as defined in Section 10912 of the Water Code that requires an EIR. Since there is no "public water system" serving the Stanford campus, the County of Santa Clara, as the CEQA Lead Agency for the 2018 General Use Permit, prepared the WSA. See Water Code Section 10910(b).

The purpose of the WSA is to evaluate whether "the total projected water supplies, determined to be available … for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses." See Water Code Section 10910(c)(4).

Project Water Demand

The WSA used pre-drought conditions (Fiscal Year 2012-13) as the starting point because this captures pre-project conditions more accurately than subsequent years during which drought conditions temporarily but substantially affected campus water usage. The 2012-13 water usage were increased as appropriate to account for the remaining development that would occur under

the 2000 General Use Permit, and the increase in water demand that would be associated with development under the proposed 2018 General Use Permit. The increased potable water demand was estimated for the categories of academic and academic support buildings, student housing, faculty/staff housing, and energy system. In addition, the increase in non-potable water demand associated with landscape irrigation was assessed.

Academic and Academic Support Buildings Potable Water Demands

The potable water demands for academic and academic support facilities include both domestic indoor usage, as well as use of potable water for outdoor landscape irrigation for certain buildings. Based on metering of the 2012-13 potable water use for the academic and academic support uses, a unit water demand of 0.072 gallons/square foot/day was estimated. This unit demand for was then used to extrapolate from the 2012-13 potable water use to project the future potable water demand resulting from additional academic and academic support growth. A total potable water demand of 0.91 mgd was estimated for all academic and academic support uses in 2035 with buildout of the proposed 2018 General Use Permit.

Student Housing Potable Water Demands

Student housing is measured in units of "beds" and represents a mixture of medium- to high-density dormitories and apartment-style units. Dining halls and other associated facilities were also included for estimating potable water demand in this land use category. Based on metering of the 2012-13 potable water use for the student housing, a water demand rate of 40.6 gallons/bed/day was estimated. This unit water demand was then used to extrapolate from the 2012-13 potable water use to project the future potable water demand resulting from additional student housing. A total potable water demand of 0.69 mgd was estimated for all student housing in 2035 with buildout of the proposed 2018 General Use Permit.

Faculty/Staff Housing Potable Water Demands

These housing units represent a mixture of medium- to high-density single family homes, townhomes and apartment-style units. The water demand for this use category included domestic indoor usage, as well as use of potable water for outdoor landscape irrigation. Based on metering of the 2012-13 potable water use for the faculty and staff housing, a 2012-13 water demand rate of 555 gallons/unit/day was estimated. Since the proposed 550 faculty/staff housing units that would be developed under the 2018 General Use Permit would be a higher-density type where less outdoor watering would occur, a lower water rate of 225 gallons/per day was used for those units.[9] A total potable water demand of 0.64 mgd would be associated with all faculty/staff housing in 2035 with buildout of the proposed 2018 General Use Permit.

Energy System Water Demands

In 2015, Stanford completed an overhaul of its campus heating and cooling system, known as SESI, which replaced Stanford's steam-based heating system with a hot-water based heating

[9] The 225 gallons/unit/day was based on usage statistics for existing comparable faculty/staff housing units in Stanford's Olmsted Terrace, Pearce Mitchell, and Peter Coutts areas. It should be noted that Stanford may consider using non-potable sources to meet some of the new housing's outdoor landscape irrigation needs, depending on location, in which case potable water use demand would be even less.

system, and replaced its cogeneration plant with a more efficient Central Energy Facility (CEF) that resulted in a substantial decrease in water usage to serve campus energy needs. The total water demand for Stanford's energy system water demand is projected to reach 0.20 mgd at buildout of the 2018 General Use Permit in 2035.This represents a reduction of 0.46 mgd from FY 2012-13 levels.

Landscape Irrigation

New development that would replace currently landscaped areas with buildings and/or pavement would cause irrigation needs to decrease, whereas similar development that would replace paved surface parking lots or non-landscaped areas with landscaping would require increased irrigation. While, as discussed in the Environmental Setting, non-potable irrigation usage fluctuates from year to year at Stanford, over time this usage remained relatively constant as the 2000 General Use Permit was implemented. New landscaping added as part of the 2018 General Use Permit would rely heavily on native plants that require low-water-demands, particularly in dry-seasons. For purposes of the WSA, irrigation demand was conservatively projected to increase by 10 percent with buildout the 2018 General Use Permit in 2025, to an estimated 1.35 mgd.

Total Projected Water Demand and Supply

Table 5.16-1 presents a summary of actual water demands and supplies for FY 2012-13 and FY 2015-16, and the projected water demands and supplies in 2035 with buildout of the 2018 General Use Permit.

TABLE 5.16-1
SUMMARY OF POTABLE AND NON-POTABLE WATER SUPPLY AND DEMAND (MILLION GALLONS/DAY)

Water Use Category	FY 2012-13 (Pre-Drought) Actual	FY 2015-16 (Actual)	2035 Projected (with buildout of 2018 General Use Permit)
Demand			
Potable	2.10	1.39	2.44
Non-Potable	1.23	0.81	1.35
Total	**3.33**	**2.20**	**3.80**
Supply			
Potable	2.91	2.91	3.03
Groundwater	1.52	1.52	1.52
Surface Water	1.12	1.12	1.12
Total	**5.55**	**5.55**	**5.67**

NOTES: Numbers are rounded.

SOURCE: Schaaf & Wheeler, 2017 (Appendix WSA)

Dry-Year Scenarios

In order to determine the adequacy of water supplies to meet project demand in non-normal or wet weather years, the WSA also considered Stanford's projected water demands and supplies for normal, single dry, and multiple dry water years; see **Table 5-16-2** with buildout of the 2018

General Use Permit Project in 2035. The projection of non-potable usage assumes that surface water is the primary source of irrigation supply, and groundwater is used to meet the remaining demand.

TABLE 5.16-2
SUMMARY OF PROJECTED DRY YEAR SUPPLY AND DEMAND

Water Use Category	Water Year Type				
	Normal Year	Single Dry Year	Multiple Dry Years		
			1	2	3
Supply					
Potable Supply (SFPUC)					
ISG[a]	3.03	2.51	2.51	2.18	2.18
ISL[b]	2.91	2.42	2.42	2.10	2.10
Surface Water Supply	1.12	0.94	0.94	0.06	0.06
Groundwater Supply	1.52	1.52	1.52	1.52	1.52
Total Supply (ISG)	**5.67**	**4.97**	**4.97**	**3.76**	**3.76**
Total Supply (ISL)	**5.55**	**4.88**	**4.88**	**3.68**	**3.68**
2035 Demands					
Potable Demand	2.44	2.46	2.46	2.07	1.83
met by ISL	2.44	2.46	2.46	2.07	1.83
Non-potable Demand	1.35	1.42	1.42	1.08	1.08
met by surface water	1.12	0.94	0.94	0.06	0.06
met by groundwater	0.23	0.48	0.48	1.02	1.02
Total Demand	**3.79**	**3.87**	**3.87**	**3.15**	**2.91**

NOTES: Numbers are rounded.

[a] ISG = Individual Supply Guarantee allocation from SFPUC
[b] ISL = Interim Supply Guarantee Limitation allocation from SFPUC

SOURCE: Schaaf & Wheeler, 2017 (Appendix WSA)

With respect to dry years, in its 2015 UWMP, the SFPUC advises wholesale customers to anticipate seeing their supply allocations reduced to as low as 83 percent of normal for a single dry year. In multiple dry year scenarios, supply might be further reduced to 72 percent of normal. Therefore, the assumed dry-year supply projections are based on the 83 percent and 72 percent planning factors from the SFPUC.

Impact Evaluation

Impact 5.16-1: The Project would result in the expansion of existing on-campus infrastructure, the construction of which could cause significant environmental effects. (*Significant*)

The proposed Project would accommodate construction of campus infrastructure improvements to support new development that would occur under the proposed 2018 General Use Permit, including water and wastewater improvements.

These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. Since on-campus utility improvements are part of the overall anticipated development program under the 2018 General Use Permit, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses in other sections of this EIR, including Section 5.2 Air Quality, 5.3 Biological Resources, 5.11 Noise and Vibration, and 5.15 Transportation and Traffic. Mitigation measures outlined in their respective sections to reduce construction related impacts would similarly apply to infrastructure improvements.

Mitigation: Implement the following mitigation measures, as needed for construction of infrastructure improvements:

Air Quality

Mitigation Measure 5.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 5.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 5.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 5.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 5.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 5.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 5.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 5.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 5.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 5.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 5.3-11(a)-(c): *Mitigation for protected trees during construction.*

Hazardous Materials

Mitigation Measure 5.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 5.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 5.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 5.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 5.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 5.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Impact 5.16-2: Project development would increase the demand for water, however it would be adequately supplied from existing entitlements and resources. (*Less than Significant*)

Under the proposed 2018 General Use Permit, additional development and growth would increase demand for both potable and non-potable water. Stanford receives its water from water purchased wholesale from the SFPUC, local surface water supplies, and groundwater. As discussed under Approach to Analysis, above, a WSA was prepared for the proposed 2018 General Use Permit pursuant to the requirements of the California Water Code enacted in Senate Bill 610. The WSA evaluated if the total projected water supplies, determined to be available for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project.

With respect to normal years, as summarized in Table 5.16-1, the WSA estimated that Stanford's total water demand upon buildout of the 2018 General Use Permit would be approximately 3.80 mgd, consisting of a potable water demand of 2.44 mgd, and a non-potable water demand of 1.35 mgd.

The WSA determined that Stanford's overall water supply with buildout of the proposed 2018 General Use Permit to be similar to conditions at present. Stanford's potable water supply allocation from the SFPUC will increase slightly from 2.91 to 3.03 mgd in 2018, when the ISL expires and the ISG is reinstated. This water allocation would be sufficient to accommodate the

potable water demand through buildout of the 2018 General Use Permit. Stanford would also maintain existing water rights for surface water diversion of non-potable water of up to 1.12 mgd. In addition, a sustainable groundwater supply of up to 1.52 mgd would be available to provide a supplemental source of non-potable water to serve the Project. Together, the local surface and groundwater sources would be sufficient to accommodate the non-potable water demand through buildout of the 2018 General Use Permit. Collectively, the total estimated water supply 5.67 mgd would be more than necessary to accommodate the projected water demand of 3.80 mgd with buildout of the 2018 General Use Permit.

As presented in Table 5.16-2, in a single dry-year scenario, Stanford's SFPUC allocation would remain sufficient to meet all potable water demands of the 2018 General Use Permit. SFPUC potable water is deemed highly reliable. Storage and redundancy built into the SFPUC system ensure that even during periods of drought, the SFPUC can provide wholesale customers with at least 80 percent of their ISGs.

In a single dry year or the first of multiple dry years, Stanford's plant irrigation demands would be expected to increase slightly. However, in multiple dry years, Stanford would implement water conservation measures to ensure that Stanford's potable and non-potable water use would not exceed the available supply. In multiple dry year scenarios, Stanford would reduce its potable water demand by 15 percent in the second year and 25 percent in the third year. Stanford achieved such reductions during the most recent drought under the 2000 General Use Permit. Feasible water conservation measures that Stanford has successfully implemented include, but are not limited to, two-day per week watering with potable water, and modified irrigation practices to avoid waste and cut back on watering of non-functional turf areas.

Although groundwater supplies would be adequate to meet non-potable demand during multi-year drought periods, Stanford would implement irrigation demand reduction measures, and similarly reduce non-potable water use by 20 percent in the second and third years of a multiyear drought. Stanford achieved such reductions during the most recent drought under the 2000 General Use Permit.

In conclusion, there would be sufficient water supplies to accommodate the water demand from buildout proposed 2018 General Use Permit through existing entitlements and resources under normal, single dry, and multiple dry water years. Thus, while the proposed 2018 General Use Permit would generate an increased demand for water, this impact would be less than significant.

Mitigation: None required.

Impact 5.16-3: The Project would increase demand for wastewater treatment, but would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (*Less than Significant*)

Under the proposed 2018 General Use Permit, additional development and growth would generate an increase in wastewater requiring treatment. As discussed in the Environmental

Setting, wastewater generated by Stanford is conveyed off-site to the City of Palo Alto Regional Wastewater Quality Control Plant (RWQCP) for treatment. The RWQCP is owned and operated by the City of Palo Alto, and is funded by several partners, including Stanford.

In order to provide a conservative analysis of Project wastewater generation, it is assumed the entirety of the net increase in potable water demand for the proposed 2018 General Use Permit as estimated in the WSA would become wastewater. This is a conservative assumption since it does not account for future conservation measures, such as improved connectivity to the campus recycled water system to these uses. The estimated net increase in wastewater generation at buildout associated with development under the proposed 2018 General Use Permit would be approximately 0.40 mgd.

As discussed in the Environmental Setting, the RWQCP has an average dry weather flow (ADWF) capacity of 39 mgd and an average wet weather flow capacity of 80 mgd, and does not currently experience any major treatment system constraints. Of this capacity, Stanford owns up to 2.11 mgd ADWF, which is just over 5 percent of the plant's capacity. Average daily flows at the RWQCP are approximately 20 mgd. Stanford's current average daily sewer discharge (2010-2016) is 1.1 mgd, which represents about 2.8 percent of the plant's total ADWF capacity.

When considering the proposed Project generated increase of 0.4 mgd, and if conservatively adding another estimated 0.2 mgd contribution from any remaining development to be built under 2000 General Use Permit, together would increase Stanford's reported average discharge from 1.1 mgd to 1.7 mgd. These total flows would be within the 2.11 mgd capacity of the RWQCP owned by Stanford. Thus, while development under the proposed 2018 General Use Permit would increase demand for wastewater treatment, the increase would be within its authorized volumes, and would not exceed wastewater treatment requirements by the RWQCB. Consequently, the proposed Project would generate a less-than-significant impact to wastewater treatment.

Mitigation: None required.

Impact 5.16-4: The Project would discharge additional flows to the municipal sewer and drainage system, but not to an extent which would exceed the facilities' capacity in light of existing commitments. (*Less than Significant*)

As discussed above, under the proposed 2018 General Use Permit, additional development and growth would generate an increase in wastewater. As discussed in the Environmental Setting, wastewater generated by Stanford is conveyed off-site to the City of Palo Alto Regional Wastewater Quality Control Plant (RWQCP) for treatment. The RWQCP is owned and operated by the City of Palo Alto, and is funded by several partners, including Stanford.

As discussed in the Environmental Setting, wastewater generated by Stanford is collected in its sanitary sewer system and then conveyed off-site to and through City of Palo Alto sewer lines to the RWQCP. Stanford sanitary sewer flow discharges to a 21-inch City main that runs parallel to

El Camino Real. Consistent with Impact 5.16-3, above, an increase in Stanford wastewater generation of 0.6 mgd (accounting for the proposed Project and contribution from any remaining unbuilt development under 2000 General Use Permit), would be equivalent to an average increase in daily flow of approximately 417 gpm. This increased flow added to measured dry weather peak flow of 1,700 gpm would remain well below this City sewer main's capacity at 4,370 gpm.

The City of Palo Alto indicates there are no capacity deficiency issues for any of the City collection mains that carry wastewater flows from the campus to the RWQCP (City of Palo, Alto, 2017). Given these factors, the increase in flow under the proposed 2018 General Use Permit would not exceed the City of Palo's sewer collection capacity. The impact would be less than significant.

Mitigation: None required.

Impact 5.16-5: Project construction would result in an increased generation of solid waste, but would not exceed permitted capacity to accommodate the Project's solid waste disposal needs or conflict with federal, State, and local statutes and regulations related to solid waste. *(Less than Significant*)

Over the duration of the proposed 2018 General Use Permit, construction and demolition activities would generate construction debris at the Project site, some of which would require disposal. The construction debris scenario used in this EIR is based on the average annual construction and demolition that occurred on the Project site under the 2000 General Use Permit from 2001 to 2015. When projecting this constant annual construction activity forward from 2018 to 2035, the total construction square footage would be similar to that anticipated in the proposed 2018 General Use Permit.

The proposed 2018 General Use Permit would be expected to result in an average of approximately 225,500 square feet of construction and 50,300 square feet of demolition per year through 2035. Based on the most conservative construction and demolition waste estimates provided by the USEPA, the annual construction and demolition under the 2018 General Use Permit would result in an estimated 4,469 tons of solid waste per year (USEPA, 2009).[10] Assuming 50 percent of all construction waste is diverted from landfills through source reduction, recycling, and composting activities per Stanford procedures and policies, consistent with CCR Title 24, the Project would generate an estimated 2,235 tons of waste per year that would be disposed at a landfill.

As described in the Environmental Setting above, Stanford's solid waste manager, Peninsula Sanitary Service, Inc. (PSSI), currently delivers construction and demolition related waste generated at the Project site to the Zanker Road Class III Landfill in San Jose. As of 2012, the

[10] The most conservative generation rates of 4.39 pounds per square foot for construction, and 158 pounds per square foot for demolition were used for this calculation. Annual construction generated waste was calculated based on: [(225,500 square feet of new construction * 4.39 pounds/square foot + 50,300 square feet of demolition * 158 pounds/square foot)/ 2,000 pounds/ton = 4,469 tons].

Zanker Road Landfill had a total remaining capacity of 700,000 cubic yards with an expected closure date of 2029. While this landfill is projected to close in 2029 - prior to full buildout of the 2018 General Use Permit in 2035 – other existing landfills are available, such as Newby Island, that would remain operational could be utilized and would have more than adequate capacity to accommodate the Project construction debris. Additionally, PSSI may identify additional neighboring landfills at future points in time. Therefore, Project construction would not exceed permitted landfill capacity nor violate any state or federal regulation related to solid waste, and the impact from construction would be less than significant.

Mitigation: None required.

Impact 5.16-6: Operation of the Project would comply with federal, state, and local statutes and regulations related to solid waste and would be adequately served by existing landfills with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (*Less than Significant*)

Operation of additional development and growth under the proposed 2018 General Use Permit would increase generation of solid waste and recyclables at the Project site. Applying existing waste generation rates[11] described in the Environmental Setting, and the net increase in Stanford population in 2035 with buildout of the 2018 General Use Permit (that is, 7,509 students, faculty, and staff, along with 1,114 family members), the Project would generate a net increase of approximately 6,381 tons of discards per year, consisting of approximately 2,328 tons of landfill waste per year, and 4,053 tons of recyclables per year. When considered in combination with the existing waste generation, Stanford would generate approximately 31,066 tons of discards per year, consisting of 11,273 tons of landfill waste per year, and 19,793 tons of recyclables per year.

As described in the Environmental Setting above, Stanford's solid waste manager currently delivers the majority of its solid waste generated at the Project site to the Newby Island Sanitary Landfill. The Newby Island Sanitary Landfill has maximum permitted throughput for up to 4,000 tons of waste per day. The total operational solid waste that would be generated under the 2018 General Use Permit that requires landfilling would represent less than one percent of the maximum daily permitted throughput at this landfill. Furthermore, this landfill has a remaining capacity of 21.2 million cubic yards, with an anticipated closure in January 2041; and therefore can accommodate solid waste disposal needs of the Project through the duration of the proposed 2018 General Use Permit.

Based on the existing disposal rates and continued waste diversion by residents and employees of Stanford, the Project would continue to be in compliance with CALGreen and AB 939. Given the above, operation of the Project would not exceed available permitted landfill capacity and would comply with federal, state, and local statutes and regulations related to solid waste diversion; the impact would be less than significant.

[11] These operational waste generation rates are conservative in that they included construction and demolition debris. Project construction waste impacts are also separately addressed in Impact 5.16-5.

Mitigation: None required.

Cumulative Impacts

Impact 5.16-7: Implementation of the proposed Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for water supplies. (*Less than Significant*)

The WSA for the proposed 2018 General Use Permit demonstrates there are adequate water supplies to accommodate the water demand from buildout of the proposed 2018 General Use Permit through existing entitlements and resources under normal and sequentially dry weather years.

Stanford provides usage statistics and demand projections to the SFPUC and SCVWD who incorporate this data into their respective UWMPs. The SFPUC and SCVWD each adopted their respective 2015 UWMPs in 2016, and which project demands for those agencies through the year 2040.[12] While, the SFPUC and SCVWD's 2015 UWMPs do not specifically address the water demands of the proposed 2018 General Use Permit, the future water demands projected in the UWMPs are nonetheless consistent with the 2018 General Use Permit WSA. The SFPUC's 2015 UWMP considers that Stanford's purchase requests will increase, and the 2018 General Use Permit WSA projected water demand is within the limits of Stanford's ISG and ISL. The SCVWD UWMP also includes increases in Stanford's total water demand projections. The 2018 General Use Permit WSA's water demand calculations were generally consistent with those identified for Stanford by neighboring public water districts. Each of these UWMPs, as well as the City of Palo Alto's 2015 UWMP, indicate that each urban water supplier has sufficient water supply to meet demand in normal years and sequential dry-weather years.

Similarly, the cumulative water supply needs of the proposed 2018 General Use Permit in combination with past, present, and reasonably foreseeable projects within the SFPUC wholesale service territory during normal, single-, and multiple-dry years could be met by 1) State voluntary and mandatory water conservation and water efficiency measures, 2) SFPUC voluntary and mandatory water conservation and water efficiency measures, 3) City water conservation measures called for in the municipal code and emergency conservation ordinance, 4) BAWSCA's long-term water supply strategy, and 5) SFPUC's WSIP improvements as identified in each of their UWMPs.

Cumulative projects would contribute to additional water demands. However, future projects would be subject to the same water conservation efforts, water efficiency measures, and water supply improvements to balance supply and demand as would the proposed 2018 General Use Permit required by the state and regional enforcement bodies. In particular, cumulative projects within the SFPUC wholesale service area would be subject to State and SFPUC voluntary and

[12] The SCVWD coordinates with City of Palo Alto Utilities as a planning partner and potential future service provider.

mandatory conservation measures to reduce usage, the BAWSCA's long-term water supply strategy to enhance supplies, and the SFPUC's WSIP projects to improve the regional water system reliability and capacity. There would be adequate water supplies to serve the proposed Project in combination with other reasonably foreseeable projects in the SFPUC wholesale service area.

Therefore, cumulative impacts to water supply would be less than significant.

Mitigation: None required.

Impact 5.16-8: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for wastewater treatment. (*Less than Significant*)

The cumulative setting for wastewater treatment would extend to the entire service area of the RWQCP.

The RWQCP serves Stanford as part of a service area of approximately 220,000 people. Under each of the growth scenarios considered in the update to the City of Palo Alto's Comprehensive Plan, future wastewater generation would increase by less than five percent of the available treatment capacity at the RWQCP, which would be far below its design and permitted wastewater treatment capacity. As addressed under Impact 5.16-3, the future increases in Project wastewater flows would be within the 2.11 mgd capacity permitted by the RWQCP for Stanford's use.

Based on the cumulative wastewater treatment demand anticipated under buildout of the 2030 Comprehensive Plan, demand generated by residents within Palo Alto, Stanford, and the remaining service area for the RWQCP would be below the facility's excess capacity.

There are no current plans for expansion of the plant. However, in 2012, the Palo Alto City Council approved the RWQCP Long Range Facilities Plan (LRFP) which determined that while the RWQCP facilities have been well maintained, much of the RWQCP unit processes and equipment are nearing the end of their useful life and will be considered for replacement or major rehabilitation over the next 15 years (City of Palo Alto, 2016). As a partner in the RWQCP, Stanford pays it fair share of capital costs, and would continue to do so over the life of the 2018 General Use Permit.

With adequate capacity for cumulative wastewater treated at RWQCB, treatment would be provided according to the wastewater treatment requirements documented in the NPDES permit for the RWQCP and enforced by the San Francisco RWQCB. Therefore, cumulative development combined with the proposed 2018 General Use Permit would not exceed wastewater treatment requirements, and cumulative impacts to wastewater treatment would be less than significant.

Mitigation: None required.

Impact 5.16-9: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for landfill space. (*Less than Significant*)

The geographic scope of the cumulative solid waste analysis is focused on the service areas of the landfills that would serve the 2018 General Use Permit. While Stanford currently relies primarily on the Newby Island Sanitary Landfill and Zanker Road Class III landfill, countywide, there are 20 additional landfills for which capacity is available (CalRecycle, 2017a).

Many past, and all present and reasonably foreseeable future development projects, which have or would generate construction and operational solid waste and, depending on the volumes and end uses, have been or would be required to implement recycling and waste reduction measures.

Of the Project generated waste, a large source would be attributed to the demolition and construction required for new buildings. Assuming no improvements are made to current diversion rates, the Project would divert over 60 percent of all waste including demolition and construction from landfills through use of recycling or reuse and thereby exceeding the requirements of CALGreen and AB 939.

All past, present, and foreseeable future projects have been and would be required to demonstrate that adequate landfill capacity is available to accommodate increased waste prior to any project approvals. Such projects have been and would also be required to comply with the recycling and reuse measures and targets established by CALGreen and AB 939 for construction and operational waste. Therefore, the proposed Project, in conjunction with other development, would not have a significant cumulative impact associated with solid waste, and the Project's cumulative impact would be less than significant.

Mitigation: None required.

5.16.6 References

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PSSI, 2017. ESA phone conversation with PSSI staff on July 21, and July 27, 2017.

Stanford, 2017i, Waste Diversion Rates 1998- 2016 Table.

Stanford, 2017j, Monthly Recycling and Landfill Tonnages, 2016 Table.

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5.17 Environmental Consequences of Off-campus Housing Under Proposed Project

5.17.1 Impacts and Mitigation Measures

Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts. (*Significant*)

The proposed 2018 General Use Permit is expected to result in demand for 2,425 off-site housing units. The growth in Stanford student, faculty, staff, postdoctoral student, and other worker households that would live off-site would likely be distributed among many jurisdictions in the Bay Area. Assuming that future off-campus residents distribute in patterns similar to how current off-campus residents live, these jurisdictions are listed in Table 5.12-11 of the Draft EIR.

With respect to affordable housing, Stanford proposes that affordable housing impact in-lieu payments made under the proposed 2018 General Use Permit would support development of affordable housing within one-half mile of any major transit stop or a high-quality transit corridor in the Bay Area.

Based upon Stanford's historical development of off-campus housing projects in the cities of Palo Alto, Menlo Park, and Los Altos, and the location of residence of existing Stanford affiliates based on Stanford's 2016 Commute Survey, the potential indirect impacts of distributing the proposed Project's off-campus housing demand within the cities of Palo Alto, Menlo Park, and Mountain View provide a representative analysis of the indirect impacts that would more broadly occur among the Bay Area jurisdictions. Specifically, as described in the Draft EIR, Palo Alto is currently home to approximately 19 percent of off-campus students, faculty, and staff; Menlo Park has 9 percent; and Mountain View has nearly 10 percent.[1] Therefore, the potential effects of any off-campus housing development projects that Stanford would potentially provide would disproportionately affect these jurisdictions compared to other communities in the Bay Area that house Stanford affiliates.

All three cities have adopted updates to their respective general plans within the last six years. The effects of population growth expected to occur during the next several decades resulting from such growth, including from residential housing development that may be associated with Stanford off-campus housing demand, have been analyzed in the Final EIRs for each respective general plan. While there are differences regarding how the analyses were conducted and how they are described in the environmental review documentation for each plan, significant impacts were identified for all three communities regarding air quality and transportation**.** It is reasonable to assume that the general plans for these communities accounted for the population growth associated with Stanford affiliates residing within each respective jurisdiction and that any off-campus housing provided by Stanford in more distant communities would have similar impacts as those identified below. Of course, the effects of population growth anticipated in those three Final

[1] Stanford University 2018 General Use Permit Draft EIR Appendix PHD, Table 13.

EIRs include the impacts of all growth, only some of which could be growth caused indirectly by Stanford's proposed 2018 General Use Permit.

Any new off-campus housing constructed as result of Project demand, including affordable housing units, would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. For purposes of this EIR, the impacts associated with the demand for off-site housing units are being analyzed as indirect impacts of the Project.

City of Palo Alto

Palo Alto adopted an update to its general plan, *Comprehensive Plan 2030*, on November 13, 2017 (City of Palo Alto, 2017a). The Final EIR prepared for the update analyzed six unique scenarios for growth in Palo Alto through 2030 (City of Palo Alto, 2017b). The total number of new housing units constructed by 2030 under the six scenarios ranged from a low of 2,720 under the "business as usual" scenario to 6,000 units under the most aggressive housing scenario. The City Council developed a "Preferred Scenario" that would result in 3,545 to 4,420 new housing units in the city by 2030.

The effects of such growth anticipated to occur under the general plan update were considered in the Final EIR. Most impacts were determined to be less than significant through implementation of identified mitigation measures. However, several impacts related to air quality and transportation/traffic were determined to remain significant and unavoidable, as summarized below:

- AIR-2: Implementation of the proposed Plan could violate an air quality standard; contribute substantially to an existing or project air quality violation; and/or result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). (All Six Scenarios)
- TRANS-1: Implementation of the project would cause an intersection to drop below its motor vehicle level of service standard, or deteriorate operations at representative intersections that already operate at a substandard level of service. (All Six Scenarios)
- TRANS-3: Implementation of the project would cause a freeway segment or ramp to drop below its level of service standard, or deteriorate operations that already operate at a substandard level of service. (All Six Scenarios)
- TRANS-6: Implementation of the project would impede the operation of a transit system as a result of congestion. (All Six Scenarios).

Regarding air quality, implementation of the general plan under all scenarios would generate a substantial increase in criteria air pollutant emissions from on-site sources, vehicle trips, and energy use, which would result in a significant, unmitigable impact. Emissions generated during construction associated with individual development projects permitted under the proposed plan also would generate significant levels of criteria air pollutants and toxic air contaminants. Under all six scenarios, the plan would cause multiple intersections to drop below their motor vehicle

level of service standard, or deteriorate operations at intersections that already operate at a substandard level. Up to eight intersections were determined to have significant intersection impacts, and seven freeway segments or ramps on U.S. 101 and I-280 also would drop below level of service standards. In addition, the degradation in level of service would impede the operation of a transit system as a result of congestion.

City of Menlo Park

Menlo Park adopted its current general plan, *ConnectMenlo*, on November 29, 2016 (City of Menlo Park, 2016a). In addition to the proposed plan and no project alternatives, the Final EIR analyzed two reduced intensity scenarios (City of Menlo Park, 2016b). The number of housing units that could be constructed by 2040 ranged from 1,000 under the no project-business as usual alternative to 5,500 units under the proposed plan. The Final EIR prepared for the general plan identified significant and unavoidable impacts for air quality, GHG emissions, transportation and circulation, and population and housing (cumulative), as summarized below:

- AQ-2a: Despite implementation of the proposed project policies as identified in Chapter 4.2, Air Quality, Table 4.2-8, criteria air pollutant emissions associated with the proposed project would cause a substantial net increase in emissions that exceeds the Bay Area Quality Management District (BAAQMD) regional significance thresholds.
- AQ-2b: Despite implementation of the proposed project policies, criteria air pollutant emissions associated with the proposed project construction activities would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.
- AQ-5: Despite implementation of the General Plan policies, criteria air pollutant emissions associated with the General Plan would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.
- GHG-1: The proposed project would result in a substantial increase in GHG emissions from existing conditions by the proposed General Plan horizon year 2040 and would not achieve the 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Additional state and federal actions are necessary to ensure that state and federally regulated sources (i.e., sources outside the City's jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the 2050 target.
- GHG-2: While the proposed project supports progress toward the long term-goals identified in Executive Order B-30-15 and Executive Order S-03-05, it cannot yet be demonstrated that Menlo Park will achieve GHG emissions reductions that are consistent with a 40 percent reduction below 1990 levels by 2030 or an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs.
- POP-4: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in a significant cumulative impacts with respect to population and housing.

- TRANS-1a: Implementation of the proposed project would exceed the City's current impact thresholds under the 2040 Plus Project conditions at some roadway segments in the study area.
- TRANS-1b: Implementation of the proposed project would result in increased delay to peak hour motor vehicle traffic exceeding the significance threshold at some of the study intersections.
- TRANS-2: Implementation of the proposed project would result in impacts to Routes of Regional Significance.
- TRANS-6a: Implementation of the proposed project would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system.
- TRANS-6b: The project would generate a substantial increase in transit riders that cannot be adequately serviced by existing public transit services, and the project would generate demand for transit services at sites more than one-quarter mile from existing public transit routes.

Similar to the determination of Palo Alto's Final EIR, implementation of Menlo Park's general plan would result in generation of criteria air pollutant emissions that would result in significant impacts during construction and operation. GHG emissions were determined to be significant and unavoidable as the emissions generated would not achieve a 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Five significant impacts were identified for transportation: exceedances of impact thresholds at roadway segments; increased delay to peak hour motor vehicle traffic thresholds; impacts to Routes of Regional significance; inadequate provision of pedestrian or bicycle facilities; and generation of a substantial increase in transit riders that cannot be adequately served by existing public transit services.

City of Mountain View

Mountain View's *2030 General Plan* (adopted July 10, 2012) determined that 8,970 new housing units could be developed in the city by 2030 (City of Mountain View, 2012a). The general plan Final EIR identified significant impacts for Air Quality, Noise, and Transportation, as summarized below (City of Mountain View, 2012b):

- TRANS-1: Implementation of the Draft General Plan and GGRP would result in increased daily land-use-based vehicle miles of travel (VMT) per service population in 2030 due to population and employment growth planned within the City.
- TRANS-2a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on one roadway study segment (39. San Antonio Road between SB US 101 Ramps and Charleston Road).
- TRANS-2b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on several roadway study segments.

- TRANS-3a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.
- TRANS-3b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.
- TRANS-4a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.
- TRANS-4b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.
- AIR-2: Implementation of the Draft General Plan and GGRP could contribute to or result in a violation of air quality standards in the existing and cumulative conditions by increasing VMT greater than the population increase.
- AIR-4: Implementation of the Draft General Plan and GGRP would result in a cumulatively considerable net increase in ozone and particulate emissions.
- NOI-1: Increased traffic from projected development under the Draft General Plan and GGRP would result in a significant increase in traffic noise levels compared to existing conditions in the 2030 and cumulative conditions along some roadway and freeway segments in the City.

Regarding air quality, impacts would result from violation of air quality standards by increasing VMT greater than the population increase, and the cumulatively considerable net increase in ozone and particulate emissions. Increased traffic noise levels along some roadway and freeway segments would be significant. Significant transportation impacts included the following: increased daily land-use-based VMT due to population and employment growth; increased motor vehicle traffic and congestion, which would result in decreased roadway and freeway segments level of service; and increased motor vehicle traffic and congestion outside the city.

Conclusion

Although the above analysis focuses on the impacts in three cities where housing locations are reasonably foreseeable, similar impacts would likely occur in other Bay Area jurisdictions where off-campus housing would be located. As discussed above, any new off-campus housing under the proposed Project would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. As such, the implementation of any mitigation measures to reduce associated environmental impacts, in particular those included in or required by General Plan EIRs, would depend on the actions of those jurisdictions.

> **Mitigation Measure 5.17-1:** The local governmental agencies in which off-campus housing would be located can and should mitigate the environmental impacts from off-campus housing to the extent feasible.

Significance after Mitigation: Significant and Unavoidable.

Given uncertainties in the specific location and type of off-campus housing that may occur under this option, it is also uncertain if feasible mitigation would exist to reduce all significant environmental impacts to a less than significant level. Further, the County cannot require or guarantee that local governments would implement mitigation measures for off-campus housing included in or required by General Plan EIRs. For these reasons, the impact is determined to be significant and unavoidable.

5.17.2 References

City of Palo Alto, *Comprehensive Plan 2030*, adopted November 13, 2017a.

City of Palo Alto, *Comprehensive Plan Update Final EIR for the City of Palo Alto*, certified November 13, 2017b.

City of Menlo Park, *ConnectMenlo*, adopted November 29, 2016a.

City of Menlo Park, *ConnectMenlo Final EIR*, certified on November 29, 2016b.

City of Mountain View, *2030 General Plan*, adopted July 10, 2012a.

City of Mountain View, *2030 General Plan Final EIR*, certified on July 10, 2012b.

CHAPTER 6
Other CEQA Issues

6.1 Introduction

Section 15126 of the CEQA Guidelines requires that when evaluating its impact on the environment all phases of a project must be considered, including planning, construction, and operation, taking account of both the short-term and long-term. More specifically, section 15126.2 requires disclosure of (1) Significant Environmental Effects Which Cannot be Avoided if the Proposed Project is Implemented (CEQA Guidelines section 15126.2(b)), (2) Significant Irreversible Environmental Changes Which Would be Caused by the Proposed Project Should it be Implemented (CEQA Guidelines section 15126.2(c)), and (3) Growth-Inducing Impact of the Proposed Project (CEQA Guidelines section 15126.2(d)).

Chapter 1, Summary of Environmental Effects, and Chapter 5, Sections 5.1 through 5.16 provide a comprehensive presentation of the environmental effects of the proposed Project, proposed mitigation measures, and conclusions regarding the level of significance of each impact before and after mitigation. Chapter 7, Alternatives, presents a comparative analysis of alternatives to the proposed Project. Other CEQA-required analyses described above are presented below.

6.2 Significant and Unavoidable Impacts

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. The environmental effects of the proposed project on various aspects of the environment are discussed in detail in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. Project-specific and cumulative impacts that cannot be avoided if the project is approved as proposed are summarized in **Table 6-1**, below.

Section 15126.2(b) also requires: “Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and reasons why the project is being proposed, notwithstanding their effect, should be described.” The discussion of the feasibility of alternatives to address significant impacts of the proposed Project is found in Chapter 7, Alternatives.

TABLE 6-1
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED PROJECT

Impacts
5.4 Cultural Resources
Impact 5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
Impact 5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources.
5.11 Noise and Vibration
Impact 5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity.
Impact 5.11-6: Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to significant cumulative noise impacts.
5.15 Transportation
Impact 5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
Impact 5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
5.17 Environmental Consequences of Stanford Providing Off-campus Housing Under Proposed Project
Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts.

6.3 Significant Irreversible Environmental Effects

Under CEQA, an EIR must analyze the extent to which a project's primary and secondary effects would commit future generations to the allocation of nonrenewable resources and to irreversible environmental damage (CEQA Guidelines Section 15126.2(c)). Specifically, Section 15126.2(c) states:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if:

- The primary and secondary impacts would generally commit future generations to similar uses;

- The project would involve a large commitment of nonrenewable resources;
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy); and/or
- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project.

With respect to the proposed Project potential to commit future generations to similar uses, Stanford's Founding Grant already requires that University lands "shall be devoted to the foundation and maintenance of the University."[1] The proposed 2018 General Use Permit would not alter the types of land uses and activities conducted at the Project site. As discussed in Chapter 3, Project Description, all new academic, academic support and residential uses developed under the proposed Project would be contained within the largely developed areas within the Academic Growth Boundary. As determined in Section 5.10, Land Use and Planning, the proposed land uses would be consistent with the existing land use designations for Stanford lands described in the Stanford Community Plan. As discussed in Section 5.3, Biological Resources, the proposed Project would not conflict with applicable plans and policies protecting sensitive resources within and outside the Academic Growth Boundary, including but not limited to, the Stanford Habitat Conservation Plan and Stanford Conservation Area Plan.

With respect to the Project relationship to commitment of non-renewable resources, and consumption of resources, these would occur during both construction and operation of the proposed 2018 General Use Permit. Construction of new development under the proposed 2018 General Use Permit would require the use of fossil fuel, construction materials and water. During operation, the proposed Project would also require in an irreversible commitment of energy, primarily in the form of fossil fuels for heating and cooling of buildings, for vehicle fuel, and for energy production; as well as potable and non-potable water for consumption, landscaping and other uses.

However, as discussed in Section 5.5, Energy Conservation, while overall energy demand is projected to increase approximately nine percent over the 2018 baseline, the per capita energy demand under the proposed 2018 General Use Permit would decrease, indicative of an overall improvement in energy efficiency compared to existing conditions. The decrease in per capita energy demand under the 2018 General Use Permit demonstrates that energy use efficiencies would increase under the proposed Project, and resulting energy use from Project implementation would not be wasteful or unnecessary. Furthermore, Stanford would be required to adhere to applicable federal and State standards designed to minimize use of fuel in construction vehicles and ensure that buildings employ required energy efficiency techniques. Stanford new building construction is subject to California's Title 24, which reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6).

[1] Stanford University Founding Grant (Nov. 11, 1885).

As described further in the Vehicle Miles Traveled (VMT) analysis presented in Section 5.15, Transportation and Traffic, the per resident and per worker VMT generation under the proposed Project would be substantially lower than the regional and countywide averages. The VMT rates would be supported by Stanford's Transportation Demand Management program and the ability for residents to commute to work or class without using personal vehicles due to the density of public transit near and on the campus. In addition, on-campus housing for faculty and students would lower commuting VMT. Lower VMT results in lower mobile fuel use per worker and per resident than the regionwide and countywide average.

In addition, as described in Section 5.7, Greenhouse Gas (GHG) Emissions, the total GHG emissions under the proposed 2018 General Use Permit would be at or below those GHG emissions under the 2018 baseline. Further, GHG emissions under the proposed 2018 General Use Permit would be below the significance thresholds that relate to consistency with GHG reduction goals for year 2030 and, to the extent feasible, year 2050.

With respect to the Project involving uses in which irreversible damage could result from any potential environmental accidents associated with the Project; these potential effects are discussed in detail in Section 5.8, Hazards and Hazardous Materials. The implementation of the proposed 2018 General Use Permit would involve operation of academic and academic support facilities, including laboratories, research facilities and other uses that may include transport, handling, storage and disposal of hazardous materials. If not handled appropriately, upset and accident conditions could result in releases of hazardous materials or wastes that could result in adverse effects to residents, workers, the public or the environment. However, with Stanford's adherence to these existing regulatory requirements and management programs, as overseen by its Environmental Health & Safety Department and the County's Hazardous Materials Compliance Division, the potential impact to workers, residents, visitors, or the environment would be reduced to a less-than-significant level.

6.4 Growth-Inducing Effects

As required under CEQA, an EIR must include a discussion of the ways in which the proposed Project could directly or indirectly foster economic or population growth, or the construction of additional housing and how that growth would, in turn, affect the surrounding environment (CEQA Guidelines Section 15126.2(d)). Growth can be induced in a number of ways, including the elimination of obstacles to growth, or through the stimulation of economic activity within the region. The discussion of removal of obstacles to growth relates directly to the removal of infrastructure limitations or regulatory constraints that could result in population growth or development unforeseen at the time of project approval. Under CEQA, growth is not necessarily considered beneficial, detrimental, or of little significance to the environment.

6.4.1 Direct Population and Employment Growth

As discussed in Section 5.12, Population and Housing, the proposed 2018 General Use Permit would directly result in development and associated population and employment growth. Stanford anticipates that it would grow by approximately 7,509 students, faculty, and staff between 2018

and 2035, which reflects an approximate 1.2 percent Compound Annual Growth Rate (CAGR). This growth includes 1,700 undergraduate students; 1,200 graduate students; 961 postdoctoral students; 420 nonmatriculated students; and 3,227 faculty and staff.

In order to accommodate the increased enrollment in students, faculty, and staff under the proposed 2018 General Use Permit, Stanford would construct up to 3,150 net new housing units/beds on the Project site, of which up to 550 units would be available for faculty, staff, postdoctoral scholars, and medical residents. This housing also would accommodate an increase of other family members of approximately 1,298 people.

Further, Stanford estimates there would be an increase of 2,101 persons in other worker populations at Stanford between 2018 and 2035 resulting from the proposed Project, which also reflects an approximate CAGR of 1.2 percent. This group would include casual, contingent, and temporary hourly employees working less than 50 percent of a full-time equivalent (FTE) employee, affiliated teaching staff, adjunct professors, visiting scholars, third-party contract workers, janitorial contract workers, and construction contract workers. Based on their estimated commute frequency, the total daily population of these other workers would increase by 1,074 workers between 2018 and 2035.

The growth of Stanford-affiliated populations, including the other worker populations, would not be entirely accommodated by housing within the Project site, and therefore would result in an indirect housing demand (and associated population growth) beyond the Project site. The proposed 2018 General Use Permit would result in demand for 2,425 off-site housing units (Stanford, 2017). It is estimated that approximately 52 percent of these households would reside in Santa Clara County, 27 percent in San Mateo County, 10 percent in Alameda County, and 8 percent in San Francisco, with the remainder in other counties in the Bay Area (Stanford, 2017). Stanford would support housing construction in Santa Clara County through its proposed continuing contribution to the County-administered Stanford Affordable Housing Fund, which was established pursuant to 2000 General Use Permit Condition F.6.

The potential physical environmental impacts associated with the direct population growth and associated housing development on the Project site anticipated under the proposed 2018 General Use Permit are evaluated in the environmental analysis sections of this EIR (e.g., Section 5.2, Air Quality; Section 5.5, Energy Consumption; Section 5.13, Public Services; Section 5.15, Transportation and Traffic; and 5.16 Utilities and Service Systems). New off-site housing that would be constructed for the additional Stanford-affiliated populations would likely result in some environmental impacts; however, it would be speculative to characterize the site-specific environmental effects resulting from the development of such off-site housing.[2] The General Plans of jurisdictions where new off-site housing would be developed contain policies and other measures that address the environmental effects of new housing development. Specific housing

[2] CEQA Guidelines section 15145 states that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

development projects also would be subject to the environmental review process of affected jurisdictions.

In general, the potential effects of this population growth could include: increased traffic congestion; increased air pollutant emissions; loss of agricultural land and open space; loss of habitat and associated flora and fauna; increased demand on public utilities and services, such as fire and police protection, water, recycled water, wastewater, solid waste, energy, and natural gas; and increased demand for housing. An increase in population growth would also require governmental services including, but not limited to, public schools, libraries, and parks.

6.4.2 Indirect Economic Growth

In addition to the employment growth generated by the proposed Project, additional local employment could be generated through what is commonly referred to as the "multiplier effect." The multiplier effect refers to the secondary economic effects caused by spending from project-generated residents and employees.

The multiplier effect also calculates *induced* employment. Induced employment follows the economic effect of employment beyond the expenditures of the employees within the Project site to include jobs created by the stream of goods and services necessary to construct the proposed Project. For example, when a manufacturer buys products or sells products, the employment associated with those inputs or outputs are considered *induced* employment. As an additional example, when an employee from the project goes out to lunch, the person who serves the project employee lunch holds a job that was *indirectly* caused by the proposed project. When the server then goes out and spends money in the economy, the jobs generated by this third-tier effect are considered induced.

The multiplier effect tends to be greater in regions with larger diverse economies (such as the Bay Area) due to a decrease in the requirement to import goods and services from outside the region, as compared to the effects of spending in smaller economies where goods and services must be imported from elsewhere.

Indirect economic growth would result under the proposed 2018 General Use Permit from non-Stanford jobs that might be induced by the growth in Stanford-affiliated populations. Indirect jobs that would be generated by the Project include those of suppliers of goods and services to Stanford and induced jobs are created through the household expenditures of Stanford and supplier workers. For example, when a Stanford faculty members purchase goods or services at local businesses, additional employees are hired.

The number of indirect and induced jobs generated by a university is commonly calculated by applying a ratio, or job multiplier, to the number of jobs provided directly by such an institution. The projected increase in jobs under the proposed 2018 General Use Permit of 5,262 positions includes not only faculty and staff, but also postdoctoral students and the other worker populations. By comparison, ABAG projects 225,740 new jobs in Santa Clara County during the

2015-2040 timeframe. Stanford jobs would comprise 2.3 percent of this increase (Stanford, 2017). Using a job multiplier of 0.73[3], an additional 3,843 jobs elsewhere in the Bay Area could be indirectly caused by or induced by growth under the proposed 2018 General Use Permit (Stanford, 2017).

6.4.3 Environmental Effects of Indirectly Caused and Induced Growth

The residence location for people working at indirect and induced jobs is unknown. For example, equipment and goods purchased by Stanford could be manufactured and distributed anywhere in the United States. Expenditures by Stanford students and employees could support businesses throughout the Bay Area. ABAG projects an increase of 835,240 jobs in the Bay Area from 2015 to 2040 (Stanford, 2017). Indirect and induced job growth (3,843 jobs) resulting from increased employment at Stanford would thus represent a small fraction of the regional projections. It would be speculative to conclude where such workers would reside or be employed in the Bay Area (or beyond), or to determine any associated environmental effects.

Growth induced directly and indirectly by the proposed Project would likely affect the greater Bay Area region. While it is acknowledged above that the precise nature, location, and magnitude of effects of indirect and induced growth is speculative, the proposed Project would likely increase overall demand in the region for housing, commercial and industrial space, and associated infrastructure. Potential effects could include: increased traffic congestion; increased air pollutant emissions; loss of agricultural land and open space; loss of habitat and associated flora and fauna; increased demand on public utilities and services, such as fire and police protection, water, recycled water, wastewater, solid waste, energy, and natural gas; and increased demand for housing. An increase in housing demand in the Bay Area region would also require governmental services including, but not limited to, schools, libraries, and parks to serve new commercial and residential development.

Indirect and induced employment and population growth could further contribute to the loss of open space because it would encourage conversion to urban uses for housing, commercial space, and infrastructure, although most jurisdictions have adopted smart-growth policies that discourage or prohibit this type of development.

6.4.4 Removal of Obstacles to Growth

The elimination of physical obstacles to growth is considered a growth-inducing effect. The proposed Project would result in development on the Project site, within the Academic Growth Boundary. As discussed in Section 5.12, Population and Housing, the proposed 2018 General Use Permit would include infrastructure improvements designed to accommodate Stanford's growth

[3] Multipliers identified in studies of other college campuses range from 0.33 to 1.36. At 0.73 indirect and induced workers per University of San Francisco worker, the study conducted for USF may provide the best "order of magnitude" estimate for regional impacts for Stanford, as it is in the same Bay Area region with the same range of available local goods and services. (Stanford, 2017)

through 2035. Possible improvements include underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, pathways, and other similar types of improvements. The scale and nature of these improvements would be to accommodate the growth and development on the Stanford campus directly attributable to the proposed 2018 General Use Permit. The infrastructure improvements undertaken as part of the proposed Project would not be designed to support growth outside the Academic Growth Boundary of the Project site, and thus would not remove an obstacle to growth elsewhere on the Stanford campus, or in adjacent jurisdictions.

6.5 References

Stanford University; *2018 General Use Permit Application*, Technical Data to Address Population and Associated Housing Demand, July 25, 2017.

CHAPTER 7
Alternatives

7.1 Introduction

An EIR must describe a range of reasonable alternatives to the proposed Project that might feasibly accomplish most of the basic objectives of the proposed Project and could avoid or substantially lessen one or more of the significant effects. This chapter describes the CEQA requirements for an alternatives analysis, presents Stanford's Project objectives, summarizes the significant effects of the proposed Project that cannot be avoided or reduced to insignificance, and describes the alternatives, including those that that were considered but dismissed from further evaluation. The chapter then considers the comparative effects of each of the alternatives relative to those of the proposed Project, and evaluates the relationship of the alternatives to the Project objectives. As required under section 15126.6(e) of the State CEQA Guidelines, an environmentally superior alternative is identified and addressed at the end of this chapter.

7.1.1 CEQA Requirements for Alternatives Analysis

CEQA requires that an EIR describe and evaluate a range of reasonable alternatives to the proposed project, or to the location of the proposed project, and evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6(a), (d)). The "range of alternatives" is governed by the "rule of reason," which requires the EIR to describe and consider only those alternatives necessary to permit informed public participation, and an informed and reasoned choice by the decision-making body (CEQA Guidelines Section 15126.6(a), (f)).

The range of alternatives must include alternatives that could feasibly attain most of the basic objectives of the project and could avoid or substantially lessen any of the significant effects of the project (CEQA Guidelines Section 15126.6(a)-(c)). CEQA generally defines "feasible" to mean an alternative that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors. In addition, the following may be taken into consideration when assessing the feasibility of alternatives: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and the ability of the proponent to attain site control (CEQA Guidelines Section 15126.6(f)(1)). If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR (CEQA Guidelines Section 15126.6(f)(2)(B)).

The description or evaluation of alternatives does not need to be exhaustive, and an EIR need not consider alternatives for which the effects cannot be reasonably determined and for which

implementation is remote or speculative. An EIR need not describe or evaluate the environmental effects of alternatives in the same level of detail as the proposed Project, but must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed Project (CEQA Guidelines Section 15126.6(d)).

The "no project" alternative must be evaluated. This analysis is required to include a discussion of the continuation of the existing conditions, as well as what could be reasonably expected to occur in the foreseeable future if the Project were not approved, based on current plans and consistent with available infrastructure and community services (CEQA Guidelines Section 15126.6(e)(2)).

CEQA also requires that an environmentally superior alternative be selected from among the alternatives. The environmentally superior alternative is the alternative with the fewest or least severe adverse environmental impacts. If the "no project" alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)).

7.2 Alternatives Selection

7.2.1 Project Objectives

As presented in Chapter 3, the objectives of the proposed Project, are reiterated below. As noted above, this EIR need only consider alternatives that would feasibly accomplish most of the proposed Project's basic objectives.

Stanford's stated objective is County approval of a 2018 General Use Permit that would authorize continued growth and development on the campus in a manner that implements the Stanford Community Plan's policies and that is consistent with the growth assumptions in the approved Sustainable Development Study. As described in Chapter 2, Project Description, Stanford's more specific objectives are as follows:

- Continue to implement the policies of the Stanford Community Plan, including policies promoting compact urban development, housing, single-occupant vehicle trip reduction, resource conservation, and health and safety;
- Continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community ("flexibility with accountability");
- Authorize continuation of existing academic, academic support and housing uses on the Stanford campus;
- Enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities;

- Enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique Escondido Village (EV) Graduate Student Residences Project;
- Enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents;
- Prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing; and
- Support existing and new academic, academic support and housing uses by authorizing new and improved parking facilities, roadway, utility and infrastructure improvements, child care centers, facilities designed to promote vehicle trip reduction, and temporary trailers for construction surge space.

7.2.2 Summary of Significant Effects of the Proposed Project

As described above, alternatives to the proposed Project must substantially lessen or avoid one or more of the significant project and/or cumulative environmental impacts. The following summarizes the conclusions for the significant and unavoidable impacts identified in Chapter 5 of this EIR.

TABLE 7-1
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED PROJECT

Impacts
5.4 Cultural Resources
Impact 5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
Impact 5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to significant cumulative adverse changes in the significance of historical resources.
5.11 Noise and Vibration
Impact 5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity.
Impact 5.11-6: Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to significant cumulative noise impacts.
5.15 Transportation
Impact 5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions.
Impact 5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
Impact 5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.
5.17 Environmental Consequences of Stanford Providing Off-campus Housing Under Proposed Project
Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts.

7.3 Alternatives Considered but Dismissed from Further Evaluation

CEQA Guidelines Section 15126.6(c) requires an EIR to identify and briefly discuss any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process. In identifying alternatives, primary consideration was given to alternatives that could reduce significant impacts while still meeting most of the project objectives.

7.3.1 Off-Site Alternative

Because the primary purpose of the proposed 2018 General Use Permit is to authorize continued growth and development of the campus in a manner that implements the Stanford Community Plan's policies and that reflects the growth assumptions in the approved Sustainable Development Study, an alternative that would provide for Stanford campus growth and development at an alternative site would not accomplish the primary Project purpose.

Stanford does have off-campus functions that serve to support its academic mission. For example, Stanford is constructing an administrative campus in Redwood City to house functions and departments that do not need to be on the academic campus lands in Santa Clara County. Stanford also has applied to the City of Menlo Park for approvals to construct multi-family housing that may be occupied by staff and other Stanford affiliates, and similarly does not need to be on the academic campus lands in Santa Clara County.

The development proposed under the 2018 General Use Permit would house academic programs, closely associated facilities, and Stanford populations that are connected to the University's programs on the academic campus lands in Santa Clara County. Locating such programs and populations offsite would not achieve most of the basic Project objectives. In particular, housing academic programs and populations that are connected to Stanford's on-campus programs at an alternative offsite location would not: encourage interdisciplinary collaboration; maintain flexibility to respond quickly to changes in educational or research technologies; balance academic and academic support space growth with student housing growth; foster collaboration and learning; prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing; and support existing and new academic, academic support and housing uses. Further, because of the interactions between programs and populations, such an alternative could tend to increase trip making and VMT, resulting in environmental impacts that would be exacerbated compared to those of the proposed Project.

Since this alternative would not accomplish the primary Project purpose and most Project objectives, and would tend to exacerbate environmental impacts rather than avoid them, it was dismissed from further evaluation.

7.3.2 All-Academic Growth/No New Housing Alternative

An alternative that focuses exclusively on academic growth, and that excludes additional student housing, would not reflect the growth assumptions in the approved Sustainable Development Study and therefore would not accomplish the primary Project purpose. Such an alternative also would not provide Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community and would not enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique EV Graduate Student Residences Project. An alternative that excludes new faculty housing would fail to enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by allowing students and faculty to live in close proximity to each other. An alternative that eliminates all housing growth also would not implement the policies of the Stanford Community Plan that encourage new housing on the Stanford campus, and that link housing growth to academic facility growth. Further, such an alternative would tend to increase commute trips and per worker VMT. Such an alternative would not achieve most of the basic Project objectives. Since this alternative would not accomplish the primary Project purpose and most Project objectives, and would tend to exacerbate environmental impacts compared to the proposed Project, it was dismissed from further evaluation.

7.3.3 All Housing Alternative

An alternative that focuses exclusively on housing growth, and that excludes growth in academic and academic support facilities, would not reflect the growth assumptions in the approved Sustainable Development Study and therefore would not accomplish the primary Project purpose. Such an alternative would not enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities. An alternative that excludes growth in academic and academic support facilities would not implement the Stanford Community Plan policies that support compact urban development within the Academic Growth Boundary and encourage development at an intensity to further use of transit. Such an alternative also would not provide Stanford flexibility to develop its lands within a framework that minimizes growth in the surrounding community. Nor would such an alternative enable Stanford to balance academic and academic support space growth with student housing. An alternative that eliminates all academic and academic support space growth would not achieve most of the basic Project objectives. Since this alternative would not accomplish the primary Project purpose and most Project objectives, it was dismissed from further evaluation.

7.3.4 No Construction Noise Variance Alternative

As discussed in Section 5.11, Noise and Vibration, there is the potential for certain construction activities that would occur under the proposed 2018 General Use Permit to result in a substantial temporary or periodic increase in ambient noise levels in and around the Project site, including at sensitive receptors. As described in Section 5.11, since it is unknown whether conditions justifying such a variance from the County's construction noise standards might occur, it is possible that these increases in ambient noise in and around the Project site could be significant; and consequently, this impact was deemed significant and unavoidable.

A potential alternative was considered in which the County would grant no variance from the County's construction noise standards for all construction work conducted under the proposed 2018 General Use Permit. This potential alternative was dismissed as infeasible for several reasons. First, there may be circumstances in which construction work conducted under the allowances of a variance could, on balance, outweigh the adverse effects associated with construction under a variance. Examples of this could include conducting work outside of the normal construction hours in order to be less disruptive to a nearby school or daycare facility, or conducting a large concrete pour on a compressed schedule (i.e., outside of the normal construction windows) to minimize disruption to neighboring uses over a longer period. Secondly, there are situations when it is not feasible to perform all of the construction work near an offsite sensitive receptor during the day. Examples of this include shifting deliveries to night hours so as to reduce daytime traffic congestion; and completing a utility project at a time when service disruption is less problematic to affected users. Finally, there are times when, due to the nature and location of the construction activity, it may be impossible to avoid exceeding the construction noise standard at the property line of a nearby sensitive receptor. An example of this would be if construction must occur on or very near a property line, certain equipment could exceed the threshold even with all feasible mitigation in place. For these reasons, this alternative was deemed to be infeasible, and was dismissed from further evaluation.

7.4 Alternatives Selected for Further Evaluation

The alternatives identified for analysis are designed to inform the public discussion and the final decisions by the Santa Clara County Board of Supervisors on the proposed 2018 General Use Permit. Specifically, the alternatives are designed to inform decision-makers about:

- The relative change in environmental impact (increase or decrease) that might be expected by potential modifications to the proposed Project; and
- The effect of the potential modifications to the Project on the ability to achieve the project objectives.

The alternatives that are evaluated in this EIR are:

1. No Project Alternative, consisting of
    a. No Project/No Development Alternative; and
    b. No Project/Individual Use Permits Alternative;

2. Reduced Project Alternative;
3. Historic Preservation Alternative;
4. Additional Housing Alternative A; and
5. Additional Housing Alternative B

Table 7-2, below, provides a summary comparison of the principal differences in characteristics between the proposed Project and the alternatives.

7.4.1 No Project Alternative

Evaluation of a No Project alternative is required to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The No Project alternative reflects the conditions that would be reasonably expected to occur in the foreseeable future if the project were not approved (CEQA Guidelines Section 15126.6(e)). Here, a range of outcomes could occur if the County decided not to approve the proposed 2018 General Use Permit. On the lowest end of the scale, future development of the Stanford campus could be limited to the remaining development already authorized by the 2000 General Use Permit. On the highest end of the scale, the same amount of development as has been requested through the proposed 2018 General Use Permit could be authorized by the County through individual permit applications and approvals. To bracket this range, the County has identified two No Project alternatives: the No Project/No Development alternative, and the No Project/Individual Permits alternative.

The No Project/No Development Alternative

Description

Under No Project/No Development Alternative, no new use permits would be approved, and all conditions of the 2000 General Use Permit would remain in place. In order to bracket the low end of potential development under No Project conditions, it is assumed that all development authorized under the 2000 General Use Permit would be implemented, but there would be no increase in the academic and academic support development square footage or number of new student housing units beyond the quantities authorized by the 2000 General Use Permit.

If all applicable conditions of the 2000 General Use Permit were met, Stanford would be able to continue to remodel existing campus facilities; build replacement academic and academic support facilities by demolishing a commensurate square footage of existing facilities; and build new replacement housing by demolishing commensurate housing units or student beds. In addition, as authorized under the 2000 General Use Permit, Stanford would continue to be able to utilize up to 50,000 square feet of construction surge space. Furthermore, Stanford would be able to utilize remaining unbuilt parking as authorized under the 2000 General Use Permit. Any net new childcare center space would need to replace existing academic and academic support space. Infrastructure improvements to serve development at the campus would continue to be allowed, as authorized under the 2000 General Use Permit.

TABLE 7-2
COMPARISON SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES

	Proposed 2018 General Use Permit	No Project Alternatives		Reduced Project Alternative	Historic Preservation Alternative	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development Alternative	No Project/ Individual Use Permits Alternative				
Development Levels							
Academic and Academic Support (net new square feet)	2,275,000	0 (Replacement of academic and academic support facilities allowed by demolishing a commensurate square footage of existing facilities)	Amount dependent on individual use permits approved	1,300,000	Similar to Project	Similar to Project	Similar to Project
Housing							
Net new housing (units/beds)	3,150	0 (Replacement of housing allowed by demolishing commensurate number of housing units or student beds)	Amount dependent on individual use permits approved	1,800	Similar to Project	5,699	4,425
- Amount of net new amount of housing available to faculty, staff, postdoctoral scholars, and medical residents (net new units/beds)	550			300	Similar to Project	2,892[b]	1,825 [b]
Other Development							
Net new childcare center space and other space that reduces vehicle trips (net new square feet)	40,000 sf	Any net new childcare center space would need to replace existing academic and academic support space	Individual childcare facilities could be sought through individual use permits	Similar to Project	Similar to Project	Similar to Project	Similar to Project
Utilization of construction surge space authorized under the 2000 General Use Permit (square feet)	up to 50,000 sf	Yes	Construction surge space for individual projects could be sought through individual use permits	Similar to Project	Similar to Project	Similar to Project	Similar to Project

TABLE 7-2 (CONTINUED)
COMPARISON SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES

	Proposed 2018 General Use Permit	No Project Alternatives		Reduced Project Alternative	Historic Preservation Alternative	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development Alternative	No Project/ Individual Use Permits Alternative				
Development Levels (cont.)							
Parking							
Utilization of the remaining unbuilt parking authorized under the 2000 General Use Permit	Yes	Yes	Stand-alone individual parking facilities or parking associated with individual buildings could be sought through individual use permits, no limit defined	Similar to Project	Similar to Project	In addition to utilizing unbuilt parking, 114 additional parking spaces would be needed for 207 additional graduate student beds. For purposes of analysis, it is assumed that parking for faculty/staff housing would not count toward campus parking limits.	In addition to utilizing unbuilt parking, 57 additional parking spaces would be needed for 104 additional graduate student beds. For purposes of analysis, it is assumed that parking for faculty/staff housing would not count toward campus parking limits.
Creation of a parking reserve	Yes	No	No	Yes, but proportionally reduced in relation to reduced academic development	Similar to Project	Similar to Project	Similar to Project
Infrastructure Improvements	Yes	Yes, in correlation with development levels authorized under the 2000 General Use Permit	Yes, in correlation with level of development	Yes, in correlation with level of development	Similar to Project	Yes, in correlation with level of development	Yes, in correlation with level of development

TABLE 7-2 (CONTINUED)
COMPARISON SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES

	Proposed 2018 General Use Permit	No Project Alternatives		Reduced Project Alternative	Historic Preservation Alternative	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development Alternative	No Project/ Individual Use Permits Alternative				
No Net New Trips Standard							
Existing							
• Implement, and update as needed, its TDM programs designed to achieve No Net New Commute Trips	Yes	Yes	No	Yes	Yes	Yes[c]	Yes[c]
• Implement off-campus trip reduction programs as contemplated by the Stanford Community Plan's trip credit policy	Yes	Yes	No	Yes	Yes	Yes	Yes
• If No Net New Commute Trips standard is exceeded, provide funding to the County for intersection improvements or alternative programs.	Yes	Yes	No	Yes	Yes	Yes	Yes
Proposed Additional							
• If No Net New Commute Trips standard is exceeded, pay a per trip fund that would be prioritized for funding trip reduction programs implemented by other entities in the vicinity, including programs that encourage and improve use of alternative transportation modes, and/or improve safety and mobility for pedestrians, bicyclists and transit users. The County would retain discretion to use the funds for intersection improvements.	Yes	No	No	Yes	Yes	Yes[c]	Yes[c]

TABLE 7-2 (CONTINUED)
COMPARISON SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES

	Proposed 2018 General Use Permit	No Project Alternatives		Reduced Project Alternative	Historic Preservation Alternative	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development Alternative	No Project/ Individual Use Permits Alternative				
Other Commitments							
Existing Sustainability Programs and Practices • Stanford would implement, and update as needed, existing sustainability programs and practices (including energy supply and efficiency, water supply and conservation, transportation, and solid waste reduction and recycling)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposed Additional Sustainability Programs and Practices							
• Stanford would meet final Tier 4 standards for all construction equipment, except for chainsaws and paving phase equipment	Yes	No	No[a]	Yes	Yes	Yes	Yes
• Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place) to minimize potential noise and vibration disruption;	Yes	No	No[a]	Yes	Yes	Yes	Yes
• All Marguerite buses would be electric by 2035	Yes	No	No[a]	Yes	Yes	Yes	Yes
• 70 percent of Stanford Land Buildings and Real Estate and Bonair fleet vehicles would be electric by 2035	Yes	No	No[a]	Yes	Yes	Yes	Yes
• Stanford would rely heavily on low-water-demand, native plants for new landscaping	Yes	No	No[a]	Yes	Yes	Yes	Yes

TABLE 7-2 (CONTINUED)
COMPARISON SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES

	Proposed 2018 General Use Permit	No Project Alternatives		Reduced Project Alternative	Historic Preservation Alternative	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development Alternative	No Project/ Individual Use Permits Alternative				
Population Increase							
Anticipated Population Growth in All Population Segments (includes undergraduates, graduate students, postdoctoral students, faculty, staff, nonmatriculated students, and other worker populations)	Background increase through 2018: 1,448 total; 1,293 daily Plus Project increase: 9,610 total; 8,583 daily	Same background increase through 2018 as proposed Project; no increase beyond 2018 assumed; possible that population could grow somewhat as building use intensifies but to a level lower than that associated with buildout of the proposed 2018 General Use Permit	Increase dependent in part on individual use permits approved	Same background increase through 2018 as proposed Project Plus the following increase: 5,492 total; 4,890 daily	Similar to Project	Similar to Project; however, the onsite residential population would be higher than the Project.	Similar to Project; however, the onsite residential population would be higher than the Project.

[a] For purposes of alternatives analysis, it is assumed that the additional commitments proposed by Stanford under the Project would not be proposed by Stanford as part of applications for individual use permits. However, it is possible that some of these types of project features could be required either as mitigation measures/conditions of approval or would be implemented as needed to comply with evolving regulatory requirements under this scenario.

[b] The number of additional housing units was calculated based on housing demand from increased faculty, staff, and postdoctoral scholars, as well other workers. The actual occupancy of these additional units under this alternative is unknown, but assumed to be potentially occupiable by unspecified proportions of some or all of these groups.

[c] Because this additional housing alternative would shift substantial numbers of commute trips to residential trips it is unknown whether the No Net New Commute Trips standard could be feasibly achieved through implementation of expanded TDM programs.

Under this alternative, all existing Stanford Community Plan policies and 2000 General Use Permit conditions, including but not limited to those associated with implementing Stanford's "No Net New Commute Trips" standard, would be maintained. It is also assumed under this alternative that Stanford's existing sustainability programs and practices would be maintained and updated as needed, including for energy supply and efficiency, water supply and conservation, transportation, and solid waste reduction and recycling.

Because there would be no increase in existing authorized development and housing levels on the Project site under this alternative beyond that authorized by the 2000 General Use Permit, no growth in Stanford's total population (including students, faculty, staff, and other worker populations) beyond 2018 is assumed. However, the analysis also recognizes that under this alternative, some unquantifiable population growth could occur as long as the No Net New Commute Trips standard was maintained or, Stanford provided funding for intersections improvements identified in the 2000 General Use Permit. Further, increases in population would tend to compress programs and other campus functions. While increases in population would be allowable, square footage constraints would tend to limit that population growth so that the campus population growth would be substantially less than that which would occur with buildout of the proposed 2018 General Use Permit.

While this alternative focuses on a scenario in which there would be no increase in development authorized under the 2000 General Use Permit, it should be noted that pursuant to the provisions of the 2000 General Use Permit, the County could incrementally amend the 2000 General Use Permit to allow individual projects or small increments of development, including increases in academic and academic support, and housing. If approved, this additional development would be subject to all applicable conditions of the 2000 General Use Permit, including any comprehensive campus-wide and site-specific measures for reducing environmental effects. Such a scenario would result in impacts similar to the impacts of the scenario assumed for the No Project/ Individual Use Permits Alternative.

Comparative Analysis of Environmental Effects

Visual and Scenic Resources

There would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project. Nearly all of the replacement academic, academic support or housing development that would occur under this alternative would be located within the Academic Growth Boundary, and not adjacent to any state scenic highway.[1] When considering these factors, this alternative would have a lesser effect on scenic vistas, scenic resources, visual character, and light and glare than the proposed Project. Furthermore, as with the proposed Project, replacement development under this alternative would be subject to the County ASA review process or other approval processes, which consider issues

[1] However, the 2000 General Use Permit does allow a cumulative maximum of 15,000 square feet in the Foothills Development District and 10,268 of those square feet remain available; therefore, a very small amount of the replacement square footage could be constructed outside the Academic Growth Boundary. Under the County's Open Space & Field Research zoning, development in the Foothills District is restricted and requires submission of a visual analysis.

of visual character and quality; would be required to be consistent with the overall aesthetic and scenic policies of the Stanford Community Plan; and would be subject to a lighting plan review as conditioned under the 2000 General Use Permit. As with the proposed Project, all impacts to visual and scenic resources under this alternative would be less than significant.

Air Quality

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, construction-related air quality effects associated with generation of criteria air pollutants and localized increases in dust would be less than the proposed Project. Implementation of a dust control plan for this alternative similar to that identified for the proposed Project would similarly ensure construction effects of criteria air pollutants would be reduced to a less than significant level. However, under this alternative, Stanford's Project commitment to use construction equipment with Tier 4 engines would not occur. Consequently, the potential for construction activities that would occur under this alternative to result in localized increases in health risks associated with exposure to toxic air contaminants (TACs) and particulate matter that is 2.5 microns in diameter ($PM_{2.5}$) would be greater than under the proposed Project. Nevertheless, as part of ASA or approval processes measures for addressing health risks similar to those identified for the proposed Project could be implemented.

Under operation of this alternative, there would be substantially less daily vehicle trip generation compared to the proposed Project, and as a result, there would be lower levels of vehicle emissions associated with the lower operational trips. However, Stanford's proposed Project commitment to electrification of the Marguerite fleet of buses and other portions of Stanford's fleet would not be mandated and, thus, may not occur under this alternative; and thus, there is no assurance that reductions in some pollutants such as particulates, reactive organic gases (ROG) and nitrogen oxide (NOx) associated with fleet electrification would be realized under this alternative. The resulting mobile source emissions still would be lower under this alternative than under the proposed Project due to fleet improvements required under existing regulations.

Because this alternative would not result in a net increase in building space and residential units above that authorized under the 2000 General Use Permit, stationary source emissions also would be reduced under this alternative as a result of reduced development.

Since there would be less overall development under this alternative compared to the proposed Project, the potential under this alternative for new laboratory fume hood emissions to result in potential operational health risk impacts may be less than under the proposed Project. However, if driven by programmatic needs, pursuant to the provisions of the 2000 General Use Permit Stanford could retrofit existing building space into labs with new fume hoods, which could result in fume hood emissions comparable to those described for the proposed Project. A mitigation measure similar to that identified for the proposed Project exists in the 2000 General Use Permit, and would similarly reduce this impact to a less-than-significant level.

Biological Resources

There would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project; and less population and associated human activity on the Project site during operation of this alternative compared to the proposed Project. Consequently, there would be less potential for construction- related effects on protected trees, nesting birds, special-status plant and animal species, riparian habitat, native oak woodland, and jurisdictional waters and wetlands under this alternative compared to the proposed Project. To the extent that campus population would be less under this alternative than under the proposed Project, operations-related effects caused by human activity would similarly be less. The 2000 General Use Permit does not include measures to protect San Francisco dusky-footed wood rat or special-status bat species. However, as part of ASA or approval processes for individual projects, implementation of biological resource protection measures similar to those identified for the proposed Project would similarly ensure construction- and operational-related effects to biological species under this alternative would be reduced to a less than significant level.

Cultural Resources

There would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project. However, since construction of new development under this alternative would require a commensurate reduction in existing academic and academic support space and housing levels, there could be a greater potential under this alternative for remodeling and/or demolition of historic buildings on the Project site compared to the proposed Project. Implementation of measures to address the treatment for demolition, remodeling and/or alteration of historic structures for this alternative similar to those identified for the proposed Project would mitigate impacts to historic resources to the extent feasible, however, as with the Project, this impact would remain significant and unavoidable for this alternative on both on a project and cumulative level.

Given the likely overall smaller footprint of construction disturbance under this alternative, potential impacts to archaeological resources, paleontological resources, human remains, and tribal cultural resources for this alternative would be less than for the proposed Project. Implementation of measures to protect archaeological resources, paleontological resources, human remains, and tribal cultural resources during construction for this alternative similar to those identified for the proposed Project would mitigate impacts to these resources to a less than significant level.

Energy Conservation

Under operation of the No Project/No Development Alternative, there could be substantially reduced daily vehicle trip generation compared to the Project. Consequently, this alternative would have less gasoline demand associated with the reduced operational trips compared to the proposed Project. However, Stanford's proposed Project commitment to electrification of the Marguerite fleet of buses and other portions of Stanford's fleet would not be mandated by the County and, thus, may not occur under this alternative; and thus, reductions in mobile gasoline consumption from reduced commute trips may be offset by increased gasoline and diesel fuel use by Marguerite buses and other portions of Stanford's fleet.

If population increases were to occur due to more intensive use of existing academic and academic support space, per worker VMT could increase due to an increased worker population without increased on-campus housing. This could increase gasoline consumption under this alternative.

This alternative would not result in a net increase in building space; therefore, electricity consumption for stationary sources would be less under this alternative than under the proposed Project. There also may be a reduction in electricity use by Marguerite buses and other Stanford fleet vehicles compared to the proposed Project under this alternative if Stanford chooses not to proceed with its fleet vehicle electrification.

Overall, this alternative could result in overall less energy consumption compared to the proposed Project, and the impact would be considered similarly less than significant.

Geology and Soils

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, impacts associated with construction-related soil erosion under this alternative would be less than the Project, and similarly less than significant. Since there would be substantially less overall development and population on the Project site under this alternative compared to the proposed Project, potential operational exposure of people and/or structures to groundshaking, landslides, unstable geologic units or soils, or soil erosion under this alternative would be less than for the Project, and would be similarly less than significant.

Greenhouse Gases

If the No Project/No Development Alternative results in a substantial decrease in campus population growth, there would be substantially reduced vehicle trip generation compared to the Project; and as a result, there would be a reduction in GHG emissions associated with this decrease in operational trips. However, continued campus population growth associated with more intensive use of academic and academic support spaces, combined with a lack of additional campus housing development, could result in increased per worker VMT and associated greenhouse gas emissions from commuting. This would partially offset the reduction in GHG emissions from the decrease in the total number of vehicle trips.

Further, Stanford's proposed Project commitment to electrification of the Marguerite fleet of buses and other portions of Stanford's fleet would not be mandated by the County and, if Stanford elects not to proceed with the electrification, would not occur under this alternative; and thus, reductions in GHG emissions associated with that Project element would not be realized under this alternative. The relative increase in gasoline-related GHG emissions under this alternative if Stanford elected not to convert Marguerite buses and other Stanford fleet vehicles to electricity would be approximately balanced out by the decrease in electrical energy and natural gas demand associated with this alternative as a result of the no net increase in building space and residential units above that authorized under the 2000 General Use Permit.

Overall, the No Project/ No Development Alternative would result in lower total GHG emissions than the proposed Project; and the impact would be similarly less than significant.

Hazards and Hazardous Materials

Since there would be substantially less overall new construction and smaller construction footprint on the Project site under the No Project/No Development Alternative compared to the proposed Project, potential construction-related impacts to soil and groundwater would be less than the Project, and implementation of standard construction best management practices would ensure those impacts would be similarly less than significant. However, since construction of new development under this alternative would require a commensurate reduction in existing academic and academic support space and housing levels, there could be the potential under this alternative for more remodeling and/or demolishing of existing older buildings on site to occur, and a related greater potential for exposure to hazardous building materials than under the proposed Project. Nevertheless, as under the Project, potential exposure to hazardous materials under this alternative would be eliminated or reduced to legally acceptable levels through compliance with abatement measures required as part of applicable regulations.

There would be substantially less overall development and smaller population on the Project site than under the Project. As a result, under this alternative, there would be fewer operations involving transportation, use, storage and disposal of hazardous materials, and correspondingly, less potential health and safety risks related to these activities, than under the proposed Project. As under the proposed Project, adherence to existing regulatory requirements and management programs would ensure these potential effects for this alternative would be reduced to a less-than-significant level.

Since there would be substantially less overall development and smaller population on the Project site under this alternative than under the proposed Project, this alternative would expose less people or structures to potential wildland fires than the proposed Project; and this impact would be similarly less than significant. In addition, effects on impairment of an adopted emergency response plan or emergency evacuation plan under this alternative would also be less than under the proposed Project, and as with the proposed Project, would be less than significant.

Hydrology and Water Quality

Since there would be substantially less overall new construction and a smaller construction footprint on the Project site under the No Project/No Development Alternative compared to the proposed Project, potential construction-related impacts to groundwater would be less than the proposed Project, and with implementation of standard construction best management practices would be similarly less than significant.

There would be substantially less overall development on the Project site compared to the proposed Project, and consequently, less potential for new development to impact water quality from increased pollutants or siltation; or increases in peak runoff potentially resulting in flooding, during operation. As with the proposed Project, adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit under this alternative would ensure potential water quality impacts from new development would be less-than-significant. Furthermore, mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements would ensure effects on peak runoff and capacity of stormwater infrastructure would be less than significant. With less overall

development and a substantially smaller footprint than the proposed Project, this Alternative would also have less potential than the proposed Project to deplete groundwater, interfere with groundwater recharge, and/or result in lowering of the groundwater table. As with the proposed Project, drainage control requirements, on-going management of groundwater use, and continued implementation of Stanford's Groundwater Recharge plan would ensure potential effects on groundwater would be less-than-significant.

Land Use and Planning

Under the No Project/No Development Alternative, no new general use permit would be approved, and no amendments to the Stanford Community Plan or zoning would occur. All conditions of the 2000 General Use Permit would remain in place, and construction of any new development would require a commensurate reduction in existing academic and academic support space and housing levels.

As under the proposed Project, most replacement academic, academic support or housing development that would occur under this alternative would be constructed within the Academic Growth Boundary.[2] Similar to the Project, at the time individual projects were proposed, the County would require Stanford to apply for County ASA or other approvals, and such approvals may be subject to additional environmental review prior to consideration of approval by the County. Similar to the proposed Project, implementation of this alternative would have a less-than-significant impact regarding consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Noise and Vibration

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, conventional construction-related noise and vibration impacts would generally be less than the proposed Project. Implementation of construction noise control measures in the 2000 General Use Permit would serve to reduce construction noise impacts of this alternative; however, as under the proposed Project, construction noise increases in ambient noise levels in the site vicinity under project and cumulative conditions would be similarly significant and unavoidable. Stanford's proposed Project commitment to use alternative pile installation methods during construction would not occur under this alternative. However, the County noise ordinance prohibits operating any device that causes vibrations that endanger health or safety or annoy or disturb persons of normal sensitivities. Consequently, compliance with the County noise ordinance would preclude Stanford from using pile driving where doing so would result in potentially significant noise and vibration impacts.[3]

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2 However, the 2000 General Use Permit does allow a cumulative maximum of 15,000 square feet in the Foothills Development District and 10,268 of those square feet remain available; therefore, some of the replacement square footage could be constructed outside the Academic Growth Boundary. Any uses placed outside of the Academic Growth Boundary would be required to be consistent with the Stanford's Community Plan's land use designations for those lands.

3 There would be no basis for the County to grant a variance from the noise ordinance for pile driving because Stanford's alternative pile installation methodology effectively establishes that no variance is warranted.

During operation of this alternative, since there would be substantially less overall development on the Project site compared to the proposed Project, there would be less noise-generating sources, such as building mechanical equipment, generators, and loading docks than under the proposed Project. Implementation of standard measures for shielding/enclosing HVAC equipment and emergency generators near sensitive receptors, similar to those identified for the proposed Project, would serve to reduce operational noise sources from this alternative, and the impact would be similarly less than significant. Since this alternative would generate less vehicle trips than the proposed Project, it would also generate less traffic noise than the proposed Project, and the impact would be similarly less than significant.

Population and Housing

Since there would be no increase in existing authorized development and housing levels on the Project site under the No Project/No Development Alternative beyond that authorized by the 2000 General Use Permit, Stanford's total population (including students, faculty, staff, and other worker populations) under this alternative may be similar to that which would occur with buildout of the 2000 General Use Permit.

Alternatively, a modest level of population growth could occur through more intensive use of academic and academic support space on the campus. Although the campus population could continue to grow without material increases in campus development, it would likely grow at a much slower rate than anticipated under the proposed Project.

This alternative would not induce the same amount of population growth as it would not propose any net new campus housing or academic and academic support space. This alternative would also not result in as much direct job growth at the Project site, and would indirectly result in less housing growth outside of the campus and less induced employment growth from businesses supported by Stanford and its employees than the proposed Project. Consequently, direct, indirect and induced population and housing growth would be less than the proposed Project, and similarly less than significant.

It should be noted that under this alternative, Stanford would not provide any additional contributions to the affordable housing fund as no new academic and academic support square footage would be added to the campus. Stanford also would not construct additional housing on the campus that qualifies as affordable under the standards identified in the County's Housing Element.

Public Services

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, impacts associated with increases in demand for fire protection, emergency medical service and police protection services during construction would be less than the proposed Project, and similarly less than significant.

Since there would be substantially less development and population on the Project site under this alternative compared to the proposed Project, operational impacts associated with increases in demand for fire protection, emergency medical service and police protection services under this

alternative would be less than the proposed Project, and similarly less than significant. In addition, impacts associated with increase enrollment in public schools under this alternative would also be less than the proposed Project, and similarly less than significant.

Recreation

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, impacts associated with construction of new recreational facilities under this alternative would be less than the proposed Project, and similarly less than significant with implementation of standard best management practices during construction.

Since there would be less population on the Project site under this alternative compared to the proposed Project, impacts associated with increases in use of existing neighborhood and regional parks and other recreational facilities under this alternative would be less than the proposed Project, and similarly less than significant.

Transportation and Traffic

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, overall construction traffic-related impacts would be less than the Project, and with implementation of similar construction traffic control measures as identified for the Project, would be similarly less than significant.

Assuming that this alternative would eliminate increases in population growth beyond the amount forecasted in 2018, it would generate less daily vehicle trips than the proposed Project, and would avoid significant and unavoidable Project and/or cumulative impacts that would occur at the following 22 study intersections in 2018 and/or 2035 with the proposed Project:

- #2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour) – 2018/2035
- #13 I-280 SB Off-Ramp / Page Mill Road (AM and PM Peak Hours) – 2018
- #17 Junipero Serra Blvd – Foothill Expressway / Page Mill Road (AM and PM Peak Hours) – 2018/2035
- #19 Hanover Street / Page Mill Road (AM Peak Hour) – 2035
- #20 El Camino Real / Page Mill Road – Oregon Expressway (AM and PM Peak Hours) – 2035
- #21 Middlefield Road / Oregon Expressway (AM Peak Hour) – 2035
- #29 Foothill Expressway / Hillview Avenue (AM Peak Hour) – 2035
- #30 Foothill Expressway / Arastradero Road (AM and PM Peak Hours) – 2018/2035
- #31 Foothill Expressway / San Antonio Road (PM Peak Hour) – 2018/2035
- #32 Foothill Expressway / El Monte Avenue (AM Peak Hour) – 2035
- #33 Foothill Expressway / Springer Road – Magdalena Avenue (AM and PM Peak Hour) – 2035
- #37 El Camino Real / Encinal Avenue (PM Peak Hour) – 2035

#38 El Camino Real / Valparaiso Avenue (PM Peak Hour) – 2035
#41 El Camino Real / Ravenswood Road (PM Peak Hour) – 2035
#48 El Camino Real / Embarcadero Road (PM Peak Hour) – 2035
#56 Alma Street / Hamilton Avenue (PM Peak Hour) – 2035
#58 Alma Street / Charleston Road (PM Peak Hour) – 2018/2035
#59 Middlefield Road / Marsh Road (AM Peak Hour) – 2035
#63 Middlefield Road / Lytton Avenue (PM Peak Hour) –2035
#66 Middlefield Road / Embarcadero Road (AM and PM Peak Hours) – 2035
#89 Central Expwy / Castro St. – Moffett Blvd. (AM Peak Hour) – 2035
#90 Foothill Expressway / Edith Avenue (PM Peak Hour) – 2035

This alternative would also avoid the impacts (albeit less than significant) related to implementation of mitigation measures at these intersections.

In addition, assuming this alternative results in no population growth beyond the amount forecasted in 2018, this alternative would also avoid significant and unavoidable Project and/or cumulative impacts that would occur on the following freeway segments in 2018 and/or 2035 with the proposed Project:

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour) – 2018/2035
  - Stevens Creek Boulevard to I-280 (AM peak hour) – 2018/2035
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour) – 2018/2035
- Northbound I- 280
  - Wolfe Road to De Anza Boulevard (AM peak hour) – 2035
  - SR 85 to Foothill Expressway (AM and PM peak hours) – 2035
  - Foothill Expressway to Magdalena Avenue (AM peak hour) – 2035
  - Sand Hill Road to Woodside Road (PM peak hour) – 2035
- Southbound I-280
  - El Monte Road to Magdalena Avenue (PM peak hour) – 2018
  - Sheep Camp Trail to Edgewood Road (AM peak hour) – 2035
  - Magdalena Avenue to Foothill Expressway (PM peak hour) – 2035
  - Foothill Expressway to SR 85 (PM peak hour) – 2035
  - De Anza Boulevard to Wolfe Road (PM peak hour) – 2035

If some population growth were to occur under the No Project/ No Development Alternative, some of the impacts to intersections and freeway segments could occur, but to a far lesser extent than under the proposed Project. It would be speculative to attempt to quantify the precise level of impacts at intersections and freeway segments under this scenario.

This alternative would also reduce the following, albeit less than significant, impacts under Project and/or cumulative conditions: contributions to delay on transit routes, impacts on residential streets in nearby neighborhoods, design hazard impacts, impacts on emergency access, and impacts to bicycle or pedestrian facilities.

If the population growth remains flat under the No Project/No Development Alternative, based on the projections of VMT in 2020 (with construction of the EV Graduate Student Residences), worker (including students) VMT per capita (4.46) would be slightly lower than under the proposed Project (4.53); and resident VMT per capita (10.09) would be lower than the proposed Project (10.75). As with the proposed Project, the worker and resident VMT would be below applicable significance thresholds, and consequently less-than-significant. However, continued population growth through more intensive use of academic and academic support space, combined with no increase in campus housing, could result in higher levels of per worker VMT under this alternative than under the proposed Project.

Utilities and Service Systems

Since there would be substantially less overall new construction on the Project site under the No Project/No Development Alternative compared to the proposed Project, impacts associated with expansion of existing on-campus infrastructure under this alternative would be less than the proposed Project, and similarly less than significant with implementation of standard best management practices during construction.

Since there would be substantially less development and population on the Project site under this alternative compared to the proposed Project, impacts associated with increase in the demand for water, and increase in demand for wastewater treatment and collection would be less than the proposed Project, and similarly less than significant. In addition, impacts associated with increased generation of solid waste and effects on landfill capacity, and compliance with federal, state, and local statutes and regulations related to solid waste, under this alternative would be less than the proposed Project, and similarly less than significant.

Ability to Meet Project Objectives

The No Project/No Development Alternative would fail to achieve the primary Project purpose and most of the basic Project objectives. This alternative would severely constrain Stanford's ability to develop the campus in a manner that reflects its historical growth rates and the growth assumptions in Stanford's approved Sustainable Development Study. If intensification of existing facilities and population growth occur under this alternative, it may occur in a manner that does not implement the Community Plan's strategies to promote compact development, increase the supply and affordability of housing, plan for a more adequate and balanced housing supply, facilitate and expedite needed residential development, and augment affordability programs and funding.

This alternative also would not accomplish the following more specific project objectives: enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural

experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities; enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique EV Graduate Student Residences Project; enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents; and support existing and new academic, academic support and housing uses by authorizing new and improved parking facilities, roadway, utility and infrastructure improvements, child care centers, facilities designed to promote vehicle trip reduction, and temporary trailers for construction surge space.

The No Project/Individual Use Permits Alternative

Description

Under the No Project/Individual Use Permits Alternative, the County would consider and potentially approve individual use permits on a "per project" basis that authorize new academic and academic support and housing development. The amount of academic and academic support, and housing that would be developed under this alternative is undefined, and would depend on the individual use permits that would be approved, although is expected to be less than that which would occur under the Project. Stanford could also potentially seek approval of certain other actions proposed under the 2018 General Use Permit, although on an individual basis, including net new childcare facilities; utilization of construction surge space; and parking for individual developments. It is also expected that Stanford would request approval of infrastructure improvements that would be required to serve this development at the campus.

The No Project/Individual Use Permits alternative assumes development under existing zoning, with issuance of individual use permits for each proposed new or expanded building on the Academic Campus lands. Under this alternative, each new project would go through use permit, architectural, and environmental review individually. Each project would be subject to stand-alone conditions of approval. It is assumed that under this alternative, Stanford would continue to implement its existing sustainability programs and practices including for energy supply and efficiency, water supply and conservation, transportation (including TDM), and solid waste reduction and recycling. While under this alternative, the conditions of the 2000 General Use Permit would not specifically apply, it is reasonable to assume that the County would impose conditions similar to most of those included in the 2000 General Use Permit, and potentially certain additional commitments that Stanford proposes under the Project, to reduce potential environmental effects of individual projects.

Since the amount of net new academic and academic support development and housing levels that would be developed on the Project site under this alternative is expected to be less than that which would occur under the Project, Stanford's total population (including students, faculty,

staff, and other worker populations) under this alternative is also expected to be less than that which would occur under the Project.

Comparative Analysis of Environmental Effects

Given the undefined amount of development that could occur under the No Project/ Individual Use Permits Alternative, quantitative comparisons of potential environmental effects of this alternative to the proposed Project cannot be made. However, in general, since there would be expected to be less overall construction and smaller footprint of construction disturbance under this alternative compared to the Project, there would be expected to be less overall site-specific construction related environmental effects, including on biological resources, cultural resources, geology and soils, hazards and hazardous materials, and hydrology and water quality. While there may be overall less construction noise under this alternative, the significant and unavoidable project and cumulative construction impact associated with substantial temporary or periodic increase in ambient noise levels would not be avoided under this alternative.

Since there would be expected to be less overall new academic and academic support space, and less new housing, and correspondingly, smaller population under this alternative compared to the Project, there would be expected to be less operational demand for public services, recreational facilities, and utilities and service systems than under the Project. With less operational development and smaller population expected under this alternative, there would also be less vehicle trip generation and VMT, less sources of and generation of air emissions, TACs and GHG emissions; less energy demand, and less noise generation than the proposed Project. This alternative could reduce the severity of, but would not avoid, the potential significant and unavoidable project and cumulative impacts to study intersection and freeways from increases in traffic volumes; and the potentially significant and unavoidable project and cumulative impacts to historical resources.

As discussed above, it is reasonable to assume that the County would impose certain conditions similar to most of those included in the 2000 General Use Permit, and potentially certain additional commitments that Stanford proposes under the Project, to reduce potential environmental effects of individual projects. It is also assumed that certain commitments may be required in part over time with evolving regulatory requirements under this scenario. However, implementation of the campus-wide No Net New Trips Commute standard may not be feasible on a project-by-project basis. Accordingly, if congestion-based traffic analyses are still allowed under CEQA when the individual projects are approved, mitigation for traffic impacts of new buildings most likely would take the form of traditional funding for intersection improvements or alternative mitigation.

Ability to Meet Project Objectives

If the same amount of development ultimately were approved, the alternative could achieve most of the basic Project objectives but not to the same degree as the proposed 2018 General Use Permit. Impacts on the surrounding community, particularly as it relates to transportation and traffic, would likely be greater than impacts resulting from a single use permit that includes measures to address impacts comprehensively, on a campus-wide basis.

In addition, the elimination of a new general use permit for Stanford would cause the County and Stanford to expend more resources on the preparation and review of individual use permits, potentially diverting these resources from other County initiatives, and other campus actions or further mitigation measures to reduce impacts.

7.4.2 Reduced Project Alternative

The Reduced Project alternative assumes a new general use permit would be sought, but for less additional academic, academic support and housing development than the proposed Project. This alternative would allow for up to two million square feet of development on the Project site (academic and academic support space, and student housing).[4] Of that total square footage, approximately 1.3 million net new square feet would be used to construct academic and academic support space.[5] Approximately 700,000 net new square feet would be used to construct on-site housing, assumed to consist of 1,000 undergraduate beds and 500 graduate student beds.[6] In addition, 300 faculty/staff housing units would be developed. This alternative would achieve the housing linkage ratio that is proposed for the Project.

Similar to the proposed Project, this alternative also assumes 40,000 square feet of trip reduction amenities such as onsite childcare and mobility hubs; and up to 50,000 square feet of construction surge space. It is also expected that Stanford would request approval of infrastructure improvements that would be required to serve such development.

Stanford indicates that to accommodate its historic rates of population growth while maintaining its historic population density (persons per square foot), Stanford would need to construct academic and academic support space at the same annual pace as has been assumed for the proposed 2018 General Use Permit. Accordingly, if the Reduced Project Alternative were approved, construction of academic and academic support space most likely would occur at the same annual rate as is assumed under the proposed Project. However, the duration for build out under the use permit under this alternative would likely be shorter than under the proposed Project because the Reduced Project Alternative's academic and student housing allocations would be exhausted sooner.

If the same academic growth rate as is calculated for the proposed Project (133,824 square feet [sf] per year) is applied to the Reduced Project Alternative's 1.3 million square feet of academic and academic support facilities, the 1.3 million square feet of academic development authorized by the alternative would be completed within 9.7 years (i.e., by Fall 2028 [10-year mark] or slightly earlier).

The estimated population growth of each Stanford population segment (including students, faculty, staff and other worker populations) that would occur between 2018 and 2028 for the Reduced Project Alternative is presented in **Table 7-3**.

4 This alternative is modeled on the "Minimal Growth Scenario" in the 2009 Stanford *Sustainable Development Study*, as described on pp. 55-57 of that Study.
5 *Sustainable Development Study* Figure 3-30 and Additional Infill Development, pp. 56 and 57.
6 *Sustainable Development Study* Figure 3.31, p. 57.

TABLE 7-3
PROJECTED POPULATION GROWTH UNDER THE REDUCED PROJECT ALTERNATIVE – ALL POPULATION SEGMENTS

Affiliation	Population 2018	Population 2028	Increase 2018- 2028
Undergraduates	7,085	8,085	1,000
Graduate Students, including PhDs	9,528	10,234	706
Postdoctoral Students[a]	2,403	2,929	526
Faculty[b]	3,073	3,505	432
On-Campus Staff[c]	8,985	10,347	1,363
Nonmatriculated Students[d]	972	1,201	229
Other Worker Populations (total / daily based on commute frequency)[e]	9,166 / 5,321	10,402 / 5,955	1,236 / 634
Total /Daily	**41,212 / 37,367**	**46,703 / 42,256**	**5,492 / 4,890**

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.
[e] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

Comparative Analysis of Environmental Effects

Between the years 2018 and 2028, the impacts of the Reduced Project Alternative would be similar to those of the proposed 2018 General Use Permit. After 2028, assuming the County does not approve another use permit or individual projects, the construction impacts of this alternative would be similar to those of the No Project/No Development alternative, as there would be no additional net new development beyond that authorized by the use permit for the Reduced Project, and correspondingly, no (or very limited) additional increase in population. Operational impacts would be less than those of the proposed Project because less academic and academic support space and housing would be constructed. (Stanford could apply for and receive County approval of another General Use Permit in 2028 that would allow additional development, but this alternative does not speculate as to whether such a use permit would be sought or issued.) The discussion below focuses on effects at the same buildout timeframe as the proposed Project (2035), except where noted otherwise below.

Visual and Scenic Resources

There would be less total new development on the Project site under the Reduced Project Alternative (i.e., no net increase in development assumed between 2028 and 2035) compared to the proposed Project. As under the proposed Project, all new academic, academic support or housing development that would occur under this alternative would be located within the Academic Growth Boundary, and not adjacent to any state scenic highway. When considering these factors, this alternative would have a lesser effect on scenic vistas, scenic resources, visual character, and light

and glare than the proposed Project. Furthermore, as with the proposed Project, development under this alternative would be subject to the County review process, which considers issues of visual character and quality; would be required to be consistent with the overall aesthetic and scenic policies of the Stanford Community Plan; and would be subject to a lighting plan similar to that required under the proposed Project. As with the proposed Project, all impacts to visual and scenic resources under this alternative would be less than significant.

Air Quality

There would be less total new construction on the Project site under the Reduced Project Alternative compared to the proposed Project. Between 2018 and 2028, construction under this alternative would occur at the same annual rate as the proposed Project during the same timeframe, so during this period, construction-related air quality effects associated with generation of criteria air pollutants, localized increases in dust, and localized increases in health risks associated with exposure to TACs and $PM_{2.5}$ would be similar to the proposed Project. Implementation of a dust control plan, and health risk screening measures for this alternative similar to those identified for the proposed Project would similarly ensure effects of dust and air toxics would be reduced to a less than significant level.

Under this alternative there would be less daily vehicle trip generation between 2028 and 2035 compared to the proposed Project. Consequently, there would be less vehicle emissions associated with this smaller increase in operational trips during this timeframe. Since there would be less total development under this alternative compared to the proposed Project, there would also be less stationary source emissions under this alternative than would occur under the proposed Project during this period. As with the proposed Project, impacts to air quality from operations under this alternative would be less than significant.

Similarly, since there would total less new development under this alternative compared to the proposed Project, the potential for new laboratory fume hood emissions to result in potential operational health risk impacts under this alternative would less than under the proposed Project. Mitigation similar to that identified for the proposed Project would similarly reduce this impact to a less-than-significant level.

Biological Resources

There would be less total new construction on the Project site under the Reduced Project Alternative compared to the proposed Project; and less population and associated human activity on the Project site during operation of this alternative compared to the proposed Project. Consequently, there would be less potential for construction- and/or operational-related effects on protected trees, nesting birds, special-status plant and animal species, riparian habitat, native oak woodland, and jurisdictional waters and wetlands, under this alternative compared to the proposed Project. Implementation of biological resource measures for this alternative similar to those identified for the proposed Project would ensure construction- and operational-related effects to biological species would be reduced to a less than significant level, similar to the proposed Project.

Cultural Resources

There would be substantially less total new construction and development on the Project site under the Reduced Project Alternative compared to the proposed Project. Consequently, under this alternative, there would be overall less potential for demolition and/or remodeling of historic buildings on the Project site. Implementation of measures to address the treatment for demolition, remodeling and/or alteration of historic structures for this alternative similar to those identified for the proposed Project would mitigate impacts to historic resources to the extent feasible, however, as with the Project, this impact would remain significant and unavoidable for this alternative on both on a project and cumulative level.

Given the likely overall smaller footprint of construction disturbance under this alternative, potential impacts to archaeological resources, paleontological resources, human remains, and tribal cultural resources for this alternative would be less than for the proposed Project. Implementation of measures to protect archaeological resources, paleontological resources, human remains, and tribal cultural resources during construction for this alternative similar to those identified for the proposed Project would mitigate impacts to these resources to a less than significant level.

Energy Conservation

Under the Reduced Project Alternative, there would be less daily vehicle trip generation between 2028 and 2035 compared to the proposed Project. Consequently, there would be a reduction in gasoline and diesel demand associated with this smaller increase in operational trips during this timeframe compared to the proposed Project. Additionally, the decrease in development envisioned under this alternative would result in a decrease in electrical energy and natural gas demand between 2028 and 2035 compared to same timeframe for the proposed Project. Consequently, this alternative would have a lesser impact with respect to energy consumption than the proposed Project, and as with the proposed Project, the impact would be less than significant.

Geology and Soils

Since there would be less total new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, impacts associated with construction-related soil erosion under this alternative would be less than the proposed Project, and similarly less than significant. Since there would be less overall development and population on the Project site under this alternative compared to the proposed Project, potential operational exposure of people and/or structures to groundshaking, landslides, unstable geologic units or soils, or soil erosion under this alternative would be less than for the proposed Project, and would be similarly less than significant.

Greenhouse Gases

Since there would be substantially less total construction on the Project site under the Reduced Project Alternative compared to the proposed Project, total construction-related GHG emissions under this alternative would be less than the proposed Project.

Under operation of this alternative, there would less daily vehicle trip generation between 2028 and 2035 than the proposed Project. Overall, there would be less vehicle GHG emissions

associated with operational trips under this alternative compared to the proposed Project during the same timeframe. Since there would be less total new development under this alternative compared to the proposed Project, less stationary source GHG emissions would be generated under this alternative than would occur under the proposed Project; and the impact would be similarly less than significant.

Hazards and Hazardous Materials

Since there would be substantially less overall new construction and smaller construction footprint on the Project site under the Reduced Project Alternative compared to the proposed Project, potential construction-related impacts to soil and groundwater would be less than the proposed Project, and with implementation of standard construction best management practices would be similarly less than significant. In addition, under this alternative, the potential for exposure to hazardous building materials during construction would be less than the proposed Project, and would be similarly eliminated or reduced to legally acceptable levels through compliance with abatement measures required as part of applicable regulations.

There would be less overall development and smaller population on the Project site under this alternative compared to the proposed Project. As a result, under this alternative, there would be less operations involving transportation, use, storage and disposal of hazardous materials, and correspondingly, less potential health and safety risks related to these activities, than under the proposed Project during this timeframe. As under the proposed Project, adherence to existing regulatory requirements and management programs would ensure these potential effects for this alternative would be reduced to a less-than-significant level.

Since there would be less overall development and smaller population on the Project site under this alternative than under the proposed Project, this alternative would expose less people or structures to potential wildland fires than the Project; and this impact would be similarly less than significant. In addition, effects on impairment of an adopted emergency response plan or emergency evacuation plan under this alternative would also be less than proposed Project, and, as with the proposed Project, the impact would be less than significant.

Hydrology and Water Quality

Since there would be less overall new construction and a smaller construction footprint on the Project site under the Reduced Project Alternative compared to the proposed Project, potential construction-related impacts to groundwater would be less than the proposed Project, and with implementation of standard construction best management practices would be similarly less than significant.

There would be less overall development on the Project site under this alternative compared to the proposed Project, and consequently, less potential for new development to impact water quality from increased pollutants or siltation; or increases in peak runoff potentially resulting in flooding, during operation. As with the proposed Project, adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit under this alternative would ensure potential water quality impacts from new development would be less-

than-significant. Furthermore, mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements would ensure effects on peak runoff and capacity of stormwater infrastructure would be less than significant. With less overall development and a smaller footprint than the proposed Project, this Alternative would also have less potential than the proposed Project to deplete groundwater, interfere with groundwater recharge, and/or result in lowering of the groundwater table. As with the proposed Project, drainage control requirements, on-going management of groundwater use, and continued implementation of Stanford's Groundwater Recharge plan would ensure potential effects on groundwater would be less-than-significant.

Land Use and Planning

Under the Reduced Project Alternative, similar to the proposed Project, a new general use permit would be sought, although for less additional academic, academic support and housing development than the proposed Project; and new conditions would be adopted as part of the new general use permit.

Similar to the proposed Project, at the time individual projects were proposed, the County would require Stanford to apply for County ASA or other approvals, and the projects may be subject to additional environmental review prior to consideration of approval by the County. Similar to the proposed Project, implementation of this alternative would have a less-than-significant impact regarding consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Noise and Vibration

Since there would be less total new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, construction-related noise and vibration impacts under this alternative would be less than the proposed Project. Implementation of construction noise control measures and a construction noise and vibration control plan would serve to reduce construction noise and vibration impacts of this alternative; however, as under the proposed Project, construction noise increases in ambient noise levels in the site vicinity under project and cumulative conditions would be similarly significant and unavoidable.

During operation of this alternative, since there would be less overall development on the Project site compared to the proposed Project, there would be less noise generating sources, such as building mechanical equipment, generators, and loading docks than under the Project. Implementation of standard measures for shielding/enclosing HVAC equipment and emergency generators similar to those identified for the proposed Project, would serve to reduce operational noise sources from this alternative, and the impact would be similarly less than significant. Since this alternative would generate less daily vehicle trips than the proposed Project between 2028 and 2035, it would also generate less traffic noise than the proposed Project during this timeframe, and the impact would be similarly less than significant.

Population and Housing

Under the Reduced Project Alternative, Stanford's total population growth (including students, faculty, staff, and other worker populations) would occur at the same rate as the proposed Project between 2018 and 2028, after which it is assumed Stanford's population would not materially increase thereafter through 2035. As discussed above, the growth between 2018 and 2028 under this alternative would be consistent with Stanford's historic annual growth rate for academic and academic support facilities. As shown in Table 7-3, the total increase in Stanford population (including students, faculty, staff, and other worker populations) under this alternative would be 5,492, with a daily population of 4,890; this is approximately 43 percent less than the increase in population generated by the proposed Project). It is estimated by Fall 2028, 1,000 undergraduates could be added under this alternative, necessitating construction of 1,000 undergraduate beds. The remaining square footage allocated to housing would provide 500 additional graduate student beds, and 300 faculty/staff units. As under the proposed Project, it is also assumed that this alternative would result in additional indirect employment from businesses supported by Stanford and its employees, in proportion to Stanford's growth.

The growth of Stanford-affiliated populations under this alternative between 2018 and 2028 would result in population growth and associated demand for housing in many Bay Area jurisdictions similar to that of the proposed Project during the same timeframe. Given Stanford's assumed flat growth thereafter, this alternative would not result in an increase in housing demand between 2028 and 2035. As a result, this alternative would have a lesser effect on population and housing growth than the proposed Project. As under the proposed Project, effects of population and housing growth attributable to this alternative would be less than significant.

Public Services

Since there would be less overall new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, impacts associated with increases in demand for fire protection, emergency medical service and police protection services during construction would be less than the proposed Project, and similarly less than significant.

Since there would be less development and population on the Project site under this alternative compared to the proposed Project, operational impacts associated with increases in demand for fire protection, emergency medical service and police protection services under this alternative would be less than the proposed Project, and similarly less than significant. In addition, impacts associated with increased enrollment in public schools under this alternative would also be less than the proposed Project, and similarly, less than significant.

Recreation

Since there would be substantially less overall new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, impacts associated with construction of new recreational facilities under this alternative would be less than the proposed Project, and similarly less than significant with implementation of standard best management practices during construction.

Since there would be fewer residents on the Project site due to the addition of fewer student beds, and no new faculty/staff housing units under this alternative compared to the proposed Project, impacts associated with increases in use of existing neighborhood and regional parks and other recreational facilities under this alternative would be less than the proposed Project, and similarly less than significant.

Transportation and Traffic

Since there would be less overall new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, overall construction traffic-related impacts would be less than the proposed Project, and with implementation of similar construction traffic control measures as identified for the Project would be similarly less than significant.

Since this alternative would generate less vehicle trips than the proposed Project, this alternative would avoid significant and unavoidable Project and/or cumulative impacts that would occur at 11 study intersections in 2018 and/or 2035 with the proposed Project (Fehr and Peers, 2017):

#21 Middlefield Road / Oregon Expressway (AM Peak Hour) – 2035

#30 Foothill Expressway / Arastradero (PM Peak Hour) – 2018; (AM/PM Peak Hour) – 2035

#32 Foothill Expressway / El Monte Avenue (AM Peak Hour) – 2035

#33 Foothill Expressway / Springer Road – Magdalena Avenue (AM and PM Peak Hour) – 2035

#48 El Camino Real / Embarcadero Road (PM Peak Hour) – 2035

#56 Alma Street / Hamilton Avenue (PM Peak Hour) – 2035

#58 Alma Street / Charleston Road (PM Peak Hour) – 2035

#59 Middlefield Road / Marsh Road (AM Peak Hour) – 2035

#63 Middlefield Road / Lytton Avenue (PM Peak Hour) – 2035

#89 Central Expressway / Castro Street-Moffett Boulevard (AM Peak Hour) – 2035

#90 Foothill Expressway / Edith Avenue (PM Peak Hour) – 2035

This alternative would still result in significant and unavoidable project and/or cumulative impacts at 11 study intersections in 2018 and/or 2035 (Fehr and Peers, 2017).

This alternative would also avoid the impacts (albeit less than significant) related to implementation of mitigation measures at these intersections.

In addition, this alternative would eliminate all significant and unavoidable Project impacts on study freeway segments in 2018, and would avoid significant and unavoidable cumulative impacts that would occur on 7 study freeway segments in 2018 and/or 2035 with the proposed Project, as identified below (Fehr and Peers, 2017):

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour) – 2018/2035
  - Stevens Creek Boulevard to I-280 (AM peak hour) – 2018/2035

- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour) – 2018/2035

- Northbound I- 280
  - Wolfe Road to De Anza Boulevard (AM peak hour) – 2035
  - Sand Hill Road to Woodside Road (PM peak hour) – 2035

- Southbound I-280
  - El Monte Road to Magdalena Avenue (PM peak hour) – 2018
  - Sheep Camp Trail to Edgewood Road (AM peak hour) – 2035
  - De Anza Boulevard to Wolfe Road (PM peak hour) – 2035

This alternative would still result in significant and unavoidable project and/or cumulative impacts at 4 study freeway segments in 2035 (Fehr and Peers, 2017).

This alternative would also reduce the following, albeit less than significant, impacts under Project and/or cumulative conditions: contributions to delay on transit routes, impacts on residential streets in nearby neighborhoods, design hazard impacts, impacts on emergency access, and impacts to bicycle or pedestrian facilities.

The Reduced Project Alternative would have a similar worker and resident VMT per capita as the proposed Project. As with the proposed Project, the worker and resident VMT would be below applicable significance thresholds, and consequently less-than-significant.

Utilities and Service Systems

Since there would be substantially less overall new construction on the Project site under the Reduced Project Alternative compared to the proposed Project, impacts associated with expansion of existing on-campus infrastructure under this alternative would be less than the proposed Project, and similarly less than significant with implementation of standard best management practices during construction.

Since there would be substantially less development and population on the Project site under this alternative compared to the proposed Project, impacts associated with increase in the demand for water, and increase in demand for wastewater treatment and collection would be less than the proposed Project, and similarly less than significant. In addition, impacts associated with increased generation of solid waste and effects on landfill capacity, and compliance with federal, state, and local statutes and regulations related to solid waste, under this alternative would be less than the proposed Project, and similarly less than significant.

Ability to Meet Project Objectives

This alternative not fully achieve the Project objectives for the following reasons:

- The alternative would result in reduced flexibility for Stanford to develop its lands within a framework that minimizes potential negative effects on the surrounding community.
- The alternative would not fully enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2028 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities.
- The alternative would not fully enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2028 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique Escondido Village Graduate Student Residences Project.
- The alternative would not fully enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents.

In addition, reducing the time period anticipated for build out of the General Use Permit would cause the County and Stanford to expend more financial resources in pursuit of another General Use Permit or individual use permits in the post-2028 period, potentially diverting these resources from other county initiatives, and other campus actions or further mitigation measures to reduce impacts.

The Reduced Project Alternative addressed in this EIR assumes 43 percent less academic and academic support development than the proposed Project, and 43 percent less housing units/beds, than the proposed Project. The County also evaluated the feasibility of an additional reduced project alternative that would further limit Stanford's academic and academic support development, and/or housing to the point where there would not be significant and unavoidable traffic impacts. The County estimated that academic and academic support development would need to be reduced by approximately 80 – 90 percent, compared to the proposed Project to avoid all significant and unavoidable traffic impacts.[7] The County determined that this potential alternative would be substantially similar to the No Project / No Development Alternative given the very limited amount of additional development allowed, and thus did not pursue evaluation of this alternative further as it was not substantially different from this alternative. Similar to the No Project / No Development Alternative, this alternative would further reduce, although would not avoid, the significant and unavoidable environmental effects from the proposed Project related to noise and historic resource impacts. As described in the No Project / No Development

[7] An exception would be the unsignalized intersection of I-280 Southbound Off-Ramp / Page Mill Road which would remain significant in the 2018 scenario.

Alternative, this alternative would further restrict the ability to meet those Project objectives identified above.

7.4.3 Historic Preservation Alternative

Description

Under the Historic Preservation Alternative, all of the buildings and structures on the Project site that are identified in this EIR as historic resources and subject to the General Use Permit would be preserved through the duration of the 2018 General Use Permit. Accordingly, under this alternative, there would be no demolition or remodeling of historic resources that would result in significant, unmitigated impacts to those historic resources. Remodeling and other alterations to historic buildings could occur if such modifications were consistent with the Secretary of Interior standards. As discussed in Section 5.4, there are 74 historic buildings, recorded as 50 historic properties (42 collegiate and eight non-collegiate properties, all located within the Academic Growth Boundary of the Project site.

It is assumed there would be certain exceptions would be allowed for the alteration and/or demolition of historic resources during the lifetime of the use permit, for reasons determined by the County wherein the resource poses a potential hazard of collapse and/or safety threat to the public; examples could include the structural condition of the resource due to age and/or as a result of natural or manmade hazard (e.g., earthquake, fire, etc.).

All other aspects of this alternative would be similar to the proposed Project including academic, academic support and housing development levels, childcare center space and other space that reduces vehicle trips, utilization of construction surge space, parking requests, and infrastructure improvements. Furthermore, all proposed additions to the Stanford's "No Net New Commute Trips" standard would apply to this alternative. In addition, all existing and proposed commitments to Stanford's sustainability programs and practices are assumed for this alternative.

Since it is assumed there would be a similar amount of net new academic and academic support development and housing levels on the Project site under this alternative as would occur under the proposed Project, Stanford's total population (including students, faculty, staff, and other worker populations) under this alternative would be similar to that which would occur with buildout of the 2018 General Use Permit.

It should be noted that under the 2000 General Use Permit, Stanford only demolished and replaced one building that was potentially eligible for listing on the California Register, the Encina Gym. In that instance, the demolished building was constructed of unreinforced masonry, and could not be occupied absent substantial seismic retrofit work. In a Supplement to the 2000 General Use Permit EIR, the County determined retrofit and re-use of that building was not feasible, and approved demolition.

Comparative Analysis of Environmental Effects

In general, and depending on the number, if any, of historic buildings that would otherwise be significantly impacted under the proposed 2018 General Use Permit, the Historic Preservation Alternative could have the incremental effect of directing more new development authorized under the general use permit to occur outside of the main campus core -where the majority of Stanford's identified historic buildings are present - onto additional undeveloped or vacant infill and redevelopment sites. However, as under the proposed Project, it is assumed all new development would continue to occur within the Academic Growth Boundary.

The only potential notable changes in environmental effects between the Historic Preservation Alternative and the proposed Project would be limited to the following environmental topics discussed below. All other environmental topics (i.e., air quality, greenhouse gas emissions, energy conservation, population and housing, public services, transportation and traffic, and utilities and service systems) would be expected to be largely the same, and consequently, are not discussed further.

Visual and Scenic Resources

Under this alternative incrementally more new development may occur toward the periphery of the Academic Growth Boundary and outside of the main campus core. This could result in incrementally more tree loss near the outer portions of the campus, and more development that may be visible (including associated nightlighting) from off-site land uses. However, as under the proposed Project, all new academic, academic support or housing development that would occur under this alternative would be located within the Academic Growth Boundary, and not adjacent to any state scenic highway. As with the proposed Project this alternative would not be expected to result in a significant effect on scenic vistas, scenic resources, visual character, and light and glare as the proposed Project. As with the proposed Project, development under this alternative would be subject to the County ASA review process or other approval processes, which consider issues of visual character and quality; would be required to be consistent with the overall aesthetic and scenic policies of the Stanford Community Plan; and would be subject to approval of a lighting plan. As with the proposed Project, all impacts to visual and scenic resources under this alternative would be less than significant.

Biological Resources

This alternative may result in in more development in closer proximity to on-site natural resources, and could result in incrementally more tree loss as compared to the proposed Project. Nevertheless, all development that would occur under this alternative would continue to be required to be developed pursuant to the policies and requirements of the Stanford Community Plan, the County's tree preservation ordinance, the Stanford Habitat Conservation Plan, which together provide protection of sensitive biological resources and impose restrictions on location of development in biological sensitive areas on the Project site. Otherwise, all construction- and/or operational-related effects on protected trees, nesting birds, special-status plant and animal species, riparian habitat, native oak woodland, and jurisdictional waters and wetlands, under this alternative would be similar compared to the proposed Project. Implementation of biological resources mitigation measures for this alternative would be similar to those identified for the

proposed Project, and would similarly ensure construction- and operational-related effects to biological species would be reduced to a less than significant level.

Cultural Resources

As discussed above, this alternative would ensure that there would be no demolition or remodeling of the historic resources (except for those exceptions noted) such that significant impacts to those resources would occur. This would avoid the significant and unavoidable Project and cumulative impacts associated with the potential for development under the Project to cause, or cumulatively cause, a substantial adverse change in the significance of a historical resource.

If under this alternative incrementally more new development occurred in peripheral areas of the Academic Growth Boundary outside of the main campus core, it could result in an incrementally greater construction footprint and more effects to undeveloped or vacant land. As a result, this alternative could have a greater potential to result in impacts to archaeological resources, paleontological resources, human remains, and tribal cultural resources compared to the proposed Project. However, implementation of measures to protect archaeological resources, paleontological resources, human remains, and tribal cultural resources during construction for this alternative similar to those identified for the proposed Project would mitigate impacts to these resources to a less than significant level.

Geology and Soils / Hydrology and Water Quality / Hazards and Hazardous Materials

This alternative could result in a greater construction footprint on the Project site, which could result in incrementally more soil erosion/siltation and/or construction-related impacts to soil and groundwater. This alternative could also result in an incremental increase in impervious surfaces on the Project site, which could result in incrementally greater impacts water quality from increased pollutants or siltation; or increases in peak runoff potentially resulting in flooding, or decrease in groundwater recharge. However, as with the Project, adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit under this alternative would ensure potential water quality impacts from new development would be less-than-significant. Furthermore, mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements would ensure effects on peak runoff and capacity of stormwater infrastructure would be less than significant. Finally, drainage control requirements, on-going management of groundwater use, and continued implementation of Stanford's Groundwater Recharge plan would ensure potential effects on groundwater would be less-than-significant.

Land Use and Planning

As under the proposed Project, under this alternative a new general use permit would be sought; and new conditions would be adopted as part of the new general use permit. Similar to the proposed Project, at the time individual projects were proposed, the County would require Stanford to apply for County ASA or other approvals, and may be subject to additional environmental review prior to consideration of approval by the County. Similar to the Project, implementation of this alternative would have a less-than-significant impact regarding

consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Noise and Vibration

This alternative could result in incrementally more construction occurring near the outer portions of the campus, including near the Project site boundary, where construction noise and vibration effects would have a greater potential to impact off-site sensitive land uses.

As under the proposed Project, implementation of construction noise control measures and a construction noise and vibration control plan would serve to reduce construction noise and vibration impacts of this alternative; however, as under the proposed Project, construction noise increases in ambient noise levels in the site vicinity under project and cumulative conditions would be similarly significant and unavoidable.

During operation of this alternative, implementation of standard measures for shielding/enclosing HVAC equipment and emergency generators similar to those identified for the proposed Project, would serve to reduce operational noise sources from this alternative, and the impact would be similarly less than significant. Potential traffic noise impacts of this alternative would be similar to the Project, and the impact would be similarly less than significant.

Recreation

If under this alternative incrementally more new development occurs in peripheral areas of the Project site, outside of the main campus core, it could result in more development occurring on the site of Stanford existing or future recreational uses, and a potential net decrease in existing or planned future sites for recreational facilities. However, as under the proposed Project, given the abundance of available land within the Academic Growth Boundary, it is expected that under this alternative Stanford would continue provide adequate on-campus recreation facilities for faculty, staff and students, and that expanded indoor recreation facilities would be authorized as needed as part of the academic and academic support space authorized by the General Use Permit.

Ability to Meet Project Objectives

Assuming the same amount of development ultimately were approved, the alternative could achieve the primary Project purpose, but if this alternative resulted in retention of historic buildings that could not be occupied or that could not feasibly be adaptively reused, this alternative would somewhat limit, but not preclude, Stanford's ability to achieve the following basic project objectives:

- Continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community ("flexibility with accountability");
- Enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and

academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities; and

- Enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the EV Graduate Student Residences Project.

Under this alternative, Stanford would be constrained in its ability to flexibly use or alter existing historic buildings that, based on objective analysis and in the considered opinion of Stanford and the County, cannot practicably be used or converted to modern academic, academic support, or housing uses.

7.4.4 Additional Housing Alternative A[8]

Description

For the purpose of comparison and to assist the public and decision-makers in understanding the implications of the construction of higher levels of housing on the Stanford campus, Additional Housing Alternative A assumes a general use permit would be modified to include the same level of academic and academic support development (i.e., 2.275 million net new square feet) as the proposed 2018 General Use Permit, but would include a requirement that Stanford provide housing equal to the increased housing demand generated by the proposed 2018 General Use Permit. Except for provision of additional parking, all other components of the proposed Project are assumed to be left unchanged for this alternative. For this reason, the analysis of Additional Housing Alternative A relies upon and incorporates by reference the description of the environmental setting, impact analyses, mitigation measures and significance conclusions for the proposed Project, in addition to analyzing the environmental effects of the increased housing included with this alternative.

Under Additional Housing Alternative A, it is assumed that the additional demand would be met by constructing additional on-campus housing (i.e., within the General Use Permit Academic Growth boundary). As described below, in addition to the proposed on-campus housing that would be provided under the proposed 2018 General Use Permit (3,150 units/beds), this alternative would also provide additional 2,549 units/beds of on-campus housing, equivalent to the net increase in off-campus housing demand that would occur under the proposed Project. Thus, Additional Housing Alternative A includes the provision of a total of 5,699 new on-campus housing units/beds.

Although Additional Housing Alternative A assumes that all new housing would be provided on-campus, under this alternative Stanford could elect to, subject to approval by the County, offset

[8] The Additional Housing Alternative A description presented herein relies in part on a housing alternatives description prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-PRD included in this document.

the incremental off-campus housing demand by providing off-campus housing. The specific amount, location and type of off-campus housing that would or could be provided are not known at this time. It would also represent a worst case as far as disclosure of reasonably foreseeable environmental effects of such housing. However, it is assumed that any portion of affordable off-campus housing provided by Stanford would be located within a six-mile radius of the campus. This is consistent with the 2000 General Use Permit Condition H.6(c).[9] Any new off-campus housing that could be proposed by Stanford under this option would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. Therefore, in order to conservatively assess the localized effects of meeting the full increase in housing demand of the proposed 2018 General Use Permit, this EIR assumes that all of the additional housing that would be developed under this alternative would be built on-campus. However, this EIR also provides a separate qualitative discussion of environmental consequences of Stanford providing additional off-campus housing under this alternative.

Similar to the proposed Project, this alternative also assumes the construction of 40,000 square feet of trip reduction amenities such as onsite childcare and mobility hubs; and up to 50,000 square feet of construction surge space. Additional Housing Alternative A assumes that, in addition to utilizing unbuilt parking authorized by the 2000 General Use Permit, 114 additional parking spaces would be needed for the 207 additional graduate student beds contemplated by this Alternative. As with the proposed Project, parking for faculty/staff housing would not count toward campus parking limits.

It is also reasonably assumed that Stanford would request approval of infrastructure improvements consistent with the levels of demand that would be required to serve development under this alternative. Similar to the proposed Project, infrastructure improvements would include utilities and circulation improvements. As under the proposed Project, some utility and habitat improvements could occur outside the Academic Growth Boundary under this alternative.

Furthermore, the proposed adjustments to the No Net New Commute Trips compliance methodology proposed under the Project would also occur under this alternative. However, it should be noted that that because this alternative would shift a substantial number of commute trips to residential trips, the No Net New Commute Trips standard may not be achieved because travel demand management (TDM) measures are not as effective in reducing residential trips, compared to commute trips.

Sustainability practices and programs that would be implemented under the proposed Project are included as part of this alternative.

[9] 2000 General Use Permit Condition H.6(c) required that cash payments made by Stanford in-lieu of providing affordable housing would be made to an escrow account established and maintained by the County for the purpose of funding affordable housing projects within a six-mile radius of the Stanford campus boundary.

On-Campus Housing

Table 7A-1 estimates the net increase in housing units under Additional Housing Alternative A. Table 7A-1 first shows the projected increase in the number of Stanford affiliates (students, faculty, staff, postdoctoral students, and other workers[10]) who would live off campus during the 2018 General Use Permit period, and the estimates of the number of households that each of these increases in population would represent (see Section 5.12, Population and Housing, and Appendix PHD in the Draft EIR for additional detail). As shown in the Table 7A-1, the total projected daily population growth at Stanford predicted to occur during implementation of the 2018 General Use Permit is 8,162 Stanford affiliates. Of that number, 3,168 of those new Stanford affiliates would be housed in the proposed new on-campus housing. This leaves 4,994 new Stanford affiliates that would be housed outside the campus, which, after accounting for non-Stanford employed adults living in campus housing, would result in an estimated increase in demand for 2,425 off-campus housing units.

As shown in Table 7A-1, under Additional Housing Alternative A the off-campus housing demand generated under the proposed 2018 General Use Permit would instead be accommodated on campus, which would translate to an equivalent increase of 2,549 new on-campus housing units/beds (207 graduate student beds[11] and 2,342 units for postdoctoral students, faculty, staff, and/or other workers). When adding the 2,549 new on-campus housing units/beds to the new on-campus housing proposed under the proposed 2018 General Use Permit (i.e., 3,150 housing units/beds), this alternative would result in a total of 5,699 new on-campus housing units/beds. This alternative would achieve the housing linkage ratio that is proposed for the Project (and as with the Project, would have a greater number of housing units/beds than required by the housing ratio).

Distribution of Additional Housing

In order to assess the comparative effects of this alternative, it is necessary to make assumptions about the location on the campus of the additional increment of housing. As under the proposed Project, it is assumed that the additional increment of on-campus housing that would occur under this alternative would be located within the Academic Growth Boundary, and not within the Campus Open Space land use designation.

10 This estimate does not include growth in non-matriculated students, estimated at 420 individuals under the proposed 2018 General Use Permit (see Draft EIR Table 5.12-9). Non-matriculated students are students taking courses or engaged in graduate-level research or training over the short term (ranging from a few hours to a few months), but who are not seeking a degree. They include students who complete courses entirely online, and students taking courses on a part-time basis. Consequently, while this population segment is accounted for in the overall population totals, it is not relevant to the anticipated demand for new housing.

11 If the increase in off-campus graduate students were housed on campus, they would be housed in student beds. As a result, the increase in 83 off-campus graduate student housing units was converted to an estimated 207 on-campus student beds.

TABLE 7A-1
NET INCREASE IN HOUSING UNITS UNDER ADDITIONAL HOUSING ALTERNATIVE A

	Undergraduate Students	Graduate Students	Postdoctoral Students[a]	Faculty[b]	Staff[c]	Other Workers[d]	Total
Total Growth During 2018 General Use Permit (Daily)	1,700	1,200	961	789	2,438	1,074	8,162
Less: Number Housed on Campus[e]	(1,700)	(918)	N/A	(550)	N/A	N/A	(3,168)
Off-Campus Stanford Population Growth	0	282	961	239	2,438	1,074	4,994
Less: Non-Stanford Population in On-Campus Housing[f]	0	(72)	0	(418)	0	0	(490)
Net Increase in Off-Campus Population under 2018 General Use Permit	0	210	961	(179)	2,438	1,074	4,504
Calculation of Increase in Off-Campus Households under 2018 General Use Permit[g]	**0**	**83**	**449**	**(102)**	**1,385**	**610**	**2,425**
Increase in Households if Beds are provided on Campus for Graduate Students rather than Off Campus Housing Units[h]		207					**2,549**
Household Adjustment Factor[g]	N/A	2.54/1.02	2.14	1.76	1.76	1.76	N/A

NOTES:

Totals shown may differ from the sums of individual numbers due to rounding.
N/A = Not applicable

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.
[e] The on-campus housing included in the proposed 2018 General Use Permit is assumed to consist of housing for 1,700 undergraduate students and 918 graduate students along with 550 units for faculty or staff.
[f] Stanford predicts 72 non-student spouses would occupy the graduate student housing that would be included in the proposed 2018 General Use Permit. In addition, each of the 550 staff and faculty units would accommodate at least one member of the staff or faculty, along with any other members of the faculty or staff household. The Draft EIR analysis assumes an average of 1.76 workers per staff or faculty household, per footnote (g) below, resulting in an average of one faculty or staff member and 0.76 other workers per faculty or staff unit.
[g] For each population group, the Draft EIR makes a household adjustment factor in order to translate population growth into new households. For graduate students and post-doctoral scholars, the adjustment is based on the average number of employed adults per household, calculated from the 2016 Commute Survey conducted by the Stanford's Department of Parking and Transportation Services. For faculty and staff, the adjustment is based on the average number of employed residents per worker household for Santa Clara County, according to 2011-2015 American Community Survey data. The Draft EIR does not apply a household adjustment factor to the undergraduate population because the 2018 General Use Permit includes enough on-campus undergraduate beds to accommodate the entire increase in the number of undergraduate students.
[h] Of the 210 graduate students that would require beds on campus, it is likely that 2 percent of them would be married to Stanford-student spouses; therefore, 207 beds would be demanded.

SOURCE: Stanford University Land Use and Environmental Planning Office (see Appendix ALT-PRD)

Other factors considered in the distribution of additional housing under this alternative are the goals to keep the interior of the campus compact and walkable, and, consistent with the 1985 Land Use Policy Agreement,[12] keep any new multi-family housing that is occupied by

[12] Please see https://www.sccgov.org/sites/dpd/Programs/Stanford/Pages/1985Policy.aspx.

non-Stanford affiliates outside the academic campus lands. The campus must remain compact and walkable so that students and faculty can travel between classes. In addition, there is a benefit for education and discovery when academic buildings are located close to one another, promoting cross-discipline exchange of information. Placing faculty/staff housing in and near the Campus Center Development District could create a barrier, or gap between existing or future academic buildings. Stanford also states that any new faculty/staff housing is likely to be placed on the outer edge of the academic campus because it is difficult to predict future housing demand and needs. If housing constructed for Stanford affiliates later needed to be converted to housing occupied by the general public, the housing sites would be subject to annexation by Palo Alto under the provisions of the 1985 Land Use Policy Agreement. Additional factors that would limit additional housing in the Lagunita Development District under this alternative include constraints posed by the Stanford Habitat Conservation Plan for land adjacent to Lagunita, and existing oak woodlands in the Lathrop Development District that constrain additional development in this district. Accordingly, it is assumed that no additional increment in on-campus housing under this alternative would be placed in the Campus Center, Lagunita and Lathrop Development Districts.

Graduate Student Beds Distribution

It is assumed that the additional increment of on-campus graduate student beds that would be developed under this alternative (207 beds) would be located in the East Campus Development District. This is the same location on campus where the most recently approved EV Graduate Residences are being constructed, and also where the 900 new graduate student housing units proposed under the 2018 General Use Permit are expected to be developed.

Faculty/Staff/Postdoctoral Students/Other Worker Housing Distribution

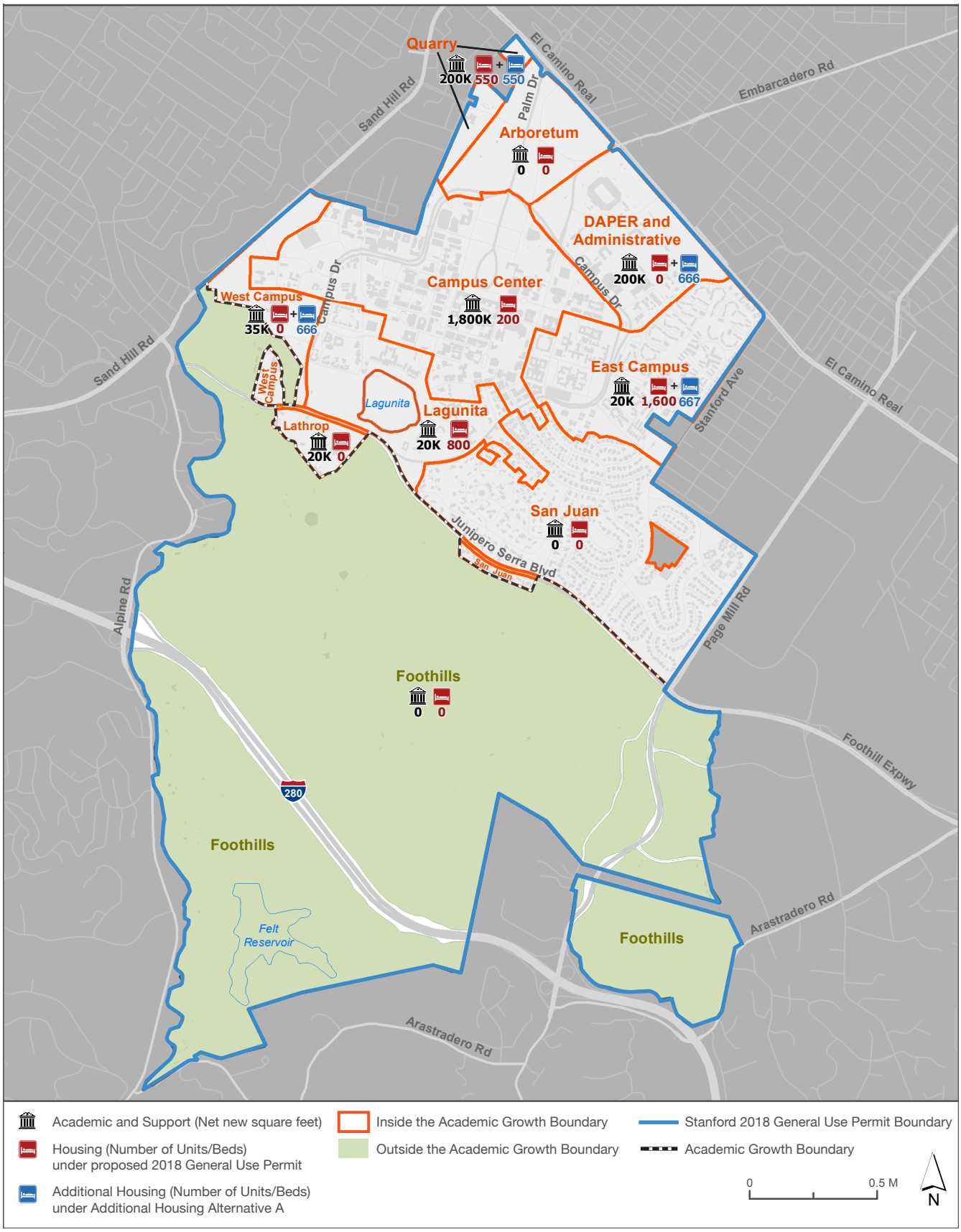
Table 7A-2 and **Figure 7.A-1** present a summary of the distribution of development within the campus development districts assumed under Additional Housing Alternative A.

TABLE 7A-2
ADDITIONAL HOUSING ALTERNATIVE A DEVELOPMENT DISTRIBUTION BY DEVELOPMENT DISTRICT

Development District	Net New Academic and Academic Support Space (Net New Square Feet)	Net Additional Housing Development (Number of Units/Beds)
Quarry	200,000	1,100
Arboretum	0	0
DAPER[a] & Administrative	200,000	666
Campus Center	1,800,000	200
East Campus	20,000	2,267
West Campus	35,000	666
Lagunita	20,000	800
Lathrop	20,000	0
San Juan	0	0
Foothills	0	0
Total	**2,275,000**	**5,699**

[a] DAPER = Department of Athletics, Physical Education, and Recreation

SOURCE: Stanford University Land Use and Environmental Planning Office, 2018



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LBRE LUEP; ESA

Figure 7.A-1
Development Districts and Assumed Distribution of Academic, Academic Support and Housing under Additional Housing Alternative A

For the reasons described above in the section titled "Distribution of Additional Housing," it is assumed that the additional increment of on-campus housing for faculty, staff, postdoctoral students and/or other workers that would be developed under this alternative (2,342 units) would be located at the edges of the Quarry, West Campus, Department of Athletics, Physical Education, and Recreation (DAPER) and Administrative, and/or East Campus Development Districts. This is similar to the approach taken by Stanford for the recently constructed faculty/staff housing on El Camino Real and Stanford Avenue, and the housing that would be developed in the Quarry Development District under the proposed 2018 General Use Permit.[13]

- 550 additional faculty, staff, postdoctoral students, and/or other worker units would be located in the Quarry Development District (for a total of 1,100 faculty/staff units in the Quarry Development District when added to the 550 units proposed by Stanford in the 2018 General Use Permit application);
- 460 faculty, staff, postdoctoral students, and/or other worker units would be located in the East Campus Development District, located at the edge of the District near El Camino Real and Stanford Avenue (which equates to 667 additional housing units added to this district when combined with the 207 graduate student beds identified above);
- 666 faculty, staff, postdoctoral students, and/or other worker units would be located in the DAPER and Administrative Development District, located at the edge of the district along El Camino Real; and
- 666 faculty, staff, postdoctoral students and/or other workers units would be located in West Campus Development District located at the edge of the district along Sand Hill Road.

Placement of additional housing in the East Campus Development District would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Further, placement of housing at the edges of the West Campus and DAPER and Administrative Development Districts could require development of lands that are currently used for existing recreation fields and/or detention basins located in these areas, which could, in turn, need to be relocated elsewhere on the campus. Under this circumstance, Stanford would provide replacement stormwater detention facilities with an equivalent detention capacity. Although speculative and not considered in this analysis, Stanford has indicated that the need to relocate these facilities could lead to requests to modify the Arboretum, other Campus Open Space areas or lands outside the Academic Growth Boundary. Any such modification would be required to comply with CEQA prior to consideration of approval.

Assumed Characteristics of Additional Housing Units

Assumptions about the potential characteristics of the additional on-campus housing under this alternative are informed by (a) the requirement in the Stanford Community Plan (Policy SCP-LU 3) that faculty/staff housing within the Academic Campus lands must be at least 15 units per acre;

[13] This pattern is also similar to Stanford's practice of building off-campus housing near the edges of the campus in other jurisdictions, such as the Stanford West apartments, Welch Road apartments, and University Terrace project in Palo Alto.

(b) the configuration and appearance of the EV Graduate Residences; and (c) the rough conceptual site planning Stanford has conducted for the proposed Quarry Road housing in support of the 2018 General Use Permit application.

Based on the Stanford Community Plan, and consistent with its policies promoting compact urban development, it is reasonable to assume that additional faculty, staff, postdoctoral student and/or other worker housing that would occur under this alternative within the Quarry, West Campus, DAPER and Administrative and/or East Campus Development Districts would be multi-family housing.

The EV Graduate Residences project and Stanford's internal conceptual site planning for the proposed new housing at Quarry Road indicate that additional graduate student housing and/or multi-family housing buildings that would be developed under this alternative could range from about 50 feet tall to heights reaching approximately 100 to 135 feet.[14,15] Based on planning for the Quarry Road housing sites proposed under the 2018 General Use Permit, densities for the additional multi-family housing under this alternative would range from about 40 to 80 units per acre.[16] The higher range of these height and density estimates would be expected for all new multi-family housing that would occur in the Quarry Development District under this alternative.[17] These heights and densities also are assumed for purposes of analysis in the remaining Development Districts.

Under this alternative, on-campus housing developed in the DAPER and Administrative, Quarry, West Campus and East Campus Development Districts could exceed 50 feet in height (up to approximately 135 feet). Under this alternative, construction of additional faculty/staff housing units in the Quarry Development District would necessitate modifications to the El Camino Real Frontage Plan. The Plan establishes a 20-foot setback along El Camino Real, and a 50 feet height limit within 100 feet of El Camino Real. The County and Stanford may determine that high density transit-oriented housing across from the Palo Alto Transit Station is an appropriate land use for this location, such that a reduced setback and increased height limits are appropriate. Construction of the additional faculty/staff units in the DAPER and Administrative Development District under this alternative could also necessitate modifications to the El Camino Frontage Plan. El Camino Real is a high-quality transit corridor. While it may be physically feasible to locate housing farther back from El Camino Real, the County may determine that retention of existing facilities and encouragement of high density housing along the transit corridor justify modifications to the El Camino Frontage Plan's setbacks and height limits.

14 While heights on both of the Quarry sites to be developed under the proposed 2018 General Use Permit are unknown and might be taller than 50 feet, Stanford assumed for conceptual planning purposes that 550 units could be achieved on these sites with buildings that are about 50 feet tall.

15 The EV Graduate Residences project currently under construction includes four residential buildings that are 116 feet to the top of the roof and 134 feet to the top of the mansard.

16 In its 2018 General Use Permit application, Stanford proposes to construct 550 units on two sites in the Quarry Development District, at a combined density of approximately 40 units/acre (on 13.5 acres).

17 If twice as many units were constructed on the Quarry Development District housing sites, the density would double and it is reasonable to assume that building heights also would double. As a result, if a total of 1,100 housing units (550 housing units proposed under the 2018 General Use Permit and 550 housing additional units under this alternative) were assumed to be placed upon the combined 13.5-acres housing sites in the Quarry Development District, the density would be approximately 80 units per acre, and building heights would be 100 feet or more.

On-campus Population

Under this alternative, as under the proposed Project, academic and academic support space would expand at a growth rate consistent with Stanford's historic growth rate for such facilities. The projected total/daily population growth (excluding campus residents) would be the same as that which would occur under the proposed 2018 General Use Permit (see Table 5.12-9 in Draft EIR Section 5.12, Population and Housing). However, since this alternative would provide additional on campus housing to accommodate the net increase in off-campus population that would occur under the proposed Project, the anticipated population that would reside on the Project site under this alternative would be greater than under the proposed Project.

Table 7A-3 summarizes the anticipated population that would reside on the Project site in 2018, and in 2035 under this alternative. This includes the increase in on-campus residential population associated with remaining authorized housing that would be developed on-site by 2020 under the 2000.

TABLE 7A-3
STANFORD POPULATION RESIDING ON PROJECT SITE UNDER ADDITIONAL HOUSING ALTERNATIVE A

Affiliation	Residential Population Within Project Site Boundary in 2018	Residential Population Within Project Site Boundary under Proposed Project in 2035[a]	Additional Change in Residential Population Within Project Site Boundary under Additional Housing Alternative A Compared to Project	Total Residential Population Within Project Site Boundary in 2035	Total Change in Residential Population Within Project Site Boundary 2018 to 2035
Undergraduate Students	6,617	8,317	0	8,317	1,700
Graduate Students	5,205	8,183	210	8,393	3,188
Non Student Spouses	660	894	17	911	251
Children	420	420	0	420	0
Faculty/Staff/Postdoctoral Students[b,c,d]	965	1,515	2,342[e]	3,857	2,892
Other Family Members	1,471	2,335	3,678	6,013	4,542
Total	**15,338**	**21,664**	**6,247**	**27,911**	**12,573**

[a] This includes increases in population associated with remaining authorized housing that would be developed on-site by 2020 under the 2000 General Use Permit, and population associated with new housing that would be authorized under the proposed 2018 General Use Permit.
[b] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[c] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[d] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[e] The number of additional housing units in Table 7A-1 for this category was calculated based on housing demand from increased faculty, staff, and postdoctoral scholars, as well other workers. The actual occupancy of these additional units under this alternative is unknown, but assumed to be potentially occupiable by unspecified proportions of some or all of these groups.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford University Residential and Dining Enterprises (see Appendix ALT-PRD)

General Use Permit and the increase in on-campus residential population associated with new housing that would be authorized under the proposed 2018 General Use Permit (together amounting to 6,326), and the increase in on-campus residential population associated with the additional on-campus housing proposed under this alternative (6,247), for a total increase in on-campus residential population of 12,573. The total on-campus residential population in 2035 under this alternative would be 27,911.

Comparative Analysis of Environmental Effects[18]

Visual and Scenic Resources

Impact 7A.1-1: Additional Housing Alternative A would not adversely affect scenic vistas. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and consequently, would have a greater potential to affect scenic vistas than the proposed Project. It is assumed that the additional increment of on-campus housing for faculty, staff and/or other workers that would be developed under this alternative (2,342 units) would be located in the Quarry, West Campus, DAPER and Administrative, and/or East Campus Development Districts (see **Figure 7.A-1**). As under the proposed Project, no new building square footage or housing would be constructed in the Foothills Development District; therefore, the existing scenic views from the Stanford hills would remain unchanged and this alternative would not adversely affect these scenic vistas.

As with the proposed Project, under this alternative, scenic views of the Stanford foothills and Santa Cruz Mountains are already limited by the topography, intervening existing buildings, and landscaping on the campus. As under the proposed Project, depending on the specific location, orientation, mass and height of the additional housing that would occur under this alternative, it would have the potential to block certain views of the foothills from areas immediately adjacent to the new buildings. Given the location of the four development districts in which the additional housing would be developed under this alternative relative to the central campus, the additional housing would not adversely affect scenic vistas of the foothills from the central campus.

Existing views of the East Bay Hills and San Francisco Bay from the central campus are similarly currently restricted due to topography and existing buildings and vegetation. Depending on specific location, orientation, mass and height of the additional housing development that would occur under this alternative, it would further block certain views of the East Bay Hills and San Francisco Bay from the central campus. However, similar to the proposed Project, the potential loss of certain limited views of the East Bay Hills due to individual additional housing projects constructed under this alternative would not significantly not adversely affect scenic vistas from the campus; therefore, similar to the proposed Project, the impact under this alternative would be less than significant.

[18] The following analysis assumes that all of the additional housing that would be developed under Additional Housing Alternative A would be built on-campus. Please see a separate discussion of environmental consequences of Stanford providing additional off-campus housing under this alternative that follows this analysis.

Sand Hill Road, which borders the West Campus Development District, is recognized as a scenic route in Policy L-9.1 of the City of Palo Alto's general plan: *Comprehensive Plan 2030*. Views of the East Bay Hills and Stanford foothills along this portion of Sand Hill Road are mostly limited to the direct line of sight along the roadway due to the topography and existing vegetation. Although the additional housing development that would occur within the West Campus Development District under Additional Housing Alternative A could potentially remove or alter the landscaping along Sand Hill Road, scenic vistas of the East Bay Hills and Stanford foothills from this road would not be adversely affected and the impact would be less than significant.

Mitigation: None required.

Impact 7A.1-2: Additional Housing Alternative A could damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and consequently, would have a greater potential to result in effects on scenic resources than the proposed Project.

As under the proposed Project, development that would occur under this alternative would not be located adjacent to any state scenic highway. Junipero Serra Boulevard and Page Mill Road are identified as scenic roads by the Santa Clara County General Plan. Most of the Foothills Development District is subject to a scenic roads zoning overlay (Zoning Ordinance Chapter 3.30) that protects the visual character of scenic roads through special development and sign regulations.

Similar to the proposed Project, any development under this alternative along Junipero Serra Boulevard and Page Mill Road would be subject to the scenic roads overlay (Section 3.30.050). It should be noted that of the four development districts in which the additional housing under this alternative is assumed to be located, only two small areas of one of the development districts (West Campus) borders Junipero Serra Boulevard. Since both of these small areas are designated as Campus Open Space and similar to the proposed Project, no housing (or any other development under this alternative) would be placed on lands with this designation.

As under the proposed Project, damage to scenic resources occurring as a result of potential infrastructure projects constructed in the vicinity of I-280, Junipero Serra Boulevard, or Page Mill Road would be reduced to a less-than-significant level through compliance with the County's scenic roads overlay regulations. Therefore, similar to the proposed Project, this alternative would have a less than significant impact on scenic resources.

Mitigation: None required.

Impact 7A.1-3: Additional Housing Alternative A could degrade the existing visual character or quality of the site and its surroundings. (*Less than Significant*)

Similar to growth proposed by the Project, all academic and academic support and housing development under Additional Housing Alternative A would be located within the Academic Growth Boundary. Although no site-specific projects and locations have been identified for housing development under this alternative, the potential effects on visual character or quality are described below for the four development districts (DAPER and Administrative, Quarry, East Campus, and West Campus) where additional housing is proposed under this alternative. This alternative's effects on visual character in the other development districts would be the same as under the proposed Project.

DAPER and Administrative Development District

Development in the DAPER and Administrative Development District under this alternative includes the additional 666 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with up to 200,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands that are located between Stanford Stadium and El Camino Real. Similar to the proposed Project, any new development that would be constructed in the interior portions of the site (i.e., along Campus Drive and Serra Street, which is currently occupied by several short administrative buildings, surface parking lots, and the Stanford Corporation Yard) would not affect the existing visual character of the area.

This alternative could include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the DAPER and Administrative Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. While it may be physically feasible to locate housing farther back from El Camino Real, the County may determine that retention of existing facilities and encouragement of high density housing along the transit corridor justify modifications to the plan's setbacks and height limits.

Placement of additional housing in the vicinity of El Camino Real could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. As under the proposed Project, any development on the existing athletic fields or the open area known as Masters Grove would degrade the relatively open quality of this area, and would be especially noticeable from off-site public vantage points if buildings are constructed in the fields adjacent to or nearby El Camino Real. Any existing fields within the DAPER and Administrative Development District that may be relocated elsewhere on campus for recreation and/or detention purposes would be of a similar type and scale as those that currently exist, and would not be considered features that would degrade visual character.

While no site-specific housing locations have been identified, each individual building or project that would be developed in this district pursuant to the proposed 2018 General Use Permit would

require submittal of an application to the County at the time proposed to determine if the project would require review under the County's ASA process. The ASA application includes submittal of various types of information that would assist the County in evaluating whether specific housing development projects proposed under this alternative would affect the visual character and quality of the site and its surroundings. In the past, Stanford has submitted visual simulations of some proposed projects that could potentially be seen from public roads outside the General Use Permit boundary. The County also may require simulations for buildings constructed through the ASA or other approval processes.

Changes to the existing visual character or quality of Stanford lands in the DAPER and Administrative District under this alternative would occur in specific locations as new buildings are constructed during the lifetime of the Project. Visually, the district would become denser over the lifetime of the Project as new buildings are constructed in proximity to existing buildings. Portions of the DAPER and Administrative District that are devoid of existing buildings would undergo noticeable visual transformation if additional housing is constructed in these areas. In addition, this district currently does not include housing for students, faculty, staff, or other workers. The significance and potential for such development to degrade the visual character of the Project site is dependent on a number of factors, including the design, location, height, massing, and landscaping surrounding new buildings. Proposed development that would have the potential to affect visual character and quality under this alternative would be subject to review by the County through the ASA process described above. Prior to submittal of an ASA application, new housing projects would be designed in accordance with County and Stanford guidance and policy documents that would limit adverse aesthetic effects of such projects. Although changes in the appearance of lands within the DAPER and Administrative District would occur over the duration of the Project, compliance with the County's ASA or other approval processes would not result in the degradation of the existing visual character or quality of the Project site. Thus, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

Quarry Development District

Development in the Quarry Development District under this alternative includes 1,100 new housing units (550 more faculty, staff, postdoctoral student and/or other worker units than under the proposed Project) and 200,000 square feet of academic and academic support space (same as the proposed Project). Because the Quarry Development District currently consists primarily of a construction staging yard and surface parking lots, any new development, whether proposed by the Project or Additional Housing Alternative A, would alter the visual character of this area. Additional housing proposed under this alternative would likely result in taller buildings and reduced open areas compared to the Project due to space limitations in this district. Stanford anticipates that the residential density in the Quarry District under this alternative would be approximately 80 units per acre and building heights could be up to 135 feet tall.

This alternative is assumed to include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the Quarry Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. The County and

Stanford may determine that high density transit-oriented housing across from the Palo Alto Transit Station is an appropriate land use for this location, such that a reduced setback and increased height limits are appropriate. The development of additional housing in this district would be noticeable compared to that proposed by the Project, even considering that the urban context of the area includes multi-story buildings such as the Hoover Pavilion and the Lucile Packard Children's Hospital Stanford.

As discussed above under DAPER and Administrative District, above, proposed development that would have the potential to affect visual character and quality in the Quarry Development District would be subject to review by the County through the ASA process. Prior to submittal of an ASA application, new housing projects would be designed in accordance with County and Stanford guidance and policy documents that would limit adverse aesthetic effects of such projects. Although changes in the appearance of lands within the Quarry Development District would occur over the duration of the Project, compliance with the County's ASA or other approval processes would not result in the degradation of the existing visual character or quality of the Project site. Thus, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

East Campus Development District

Development in the East Campus Development District under this alternative includes 2,267 new housing units (667 more units than the proposed Project, including an additional 460 faculty, staff, postdoctoral student and/or other worker units as well as 207 graduate student units) and 20,000 square feet of academic and academic support space (same as the proposed Project). Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. Stanford has indicated that placement of additional housing in this district would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Additional housing proposed in this development district would not change the existing visual character of this district as this district consists almost entirely of graduate and undergraduate housing, of varying building types and sizes. As shown on Figure 5.1-3 in Section 5.1 in the Draft EIR, views of the interior portion of the East Campus Development District, and thus possible building sites, would largely be hidden from public vantage points adjacent to the district. As under the proposed Project, new buildings would likely not be constructed along Stanford Avenue or El Camino Real, as those areas were recently developed with new faculty and staff housing. Similar to the proposed Project, development in the East Campus Development District would be designed in accordance with County and Stanford guidance and policy documents, and would be subject to review by the County through the ASA process. Therefore, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

West Campus Development District

Development in the West Campus Development District under this alternative includes the additional 666 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with 35,000 square feet of academic and academic support space that was

proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands currently occupied by the Palo Alto Stock Farm Stable (Red Barn), and another narrow strip of land along Campus Drive near its intersection with Junipero Serra Boulevard. New housing proposed under this alternative would represent a noticeable increase in development intensity compared to the relatively small amount of academic and academic support space proposed for this district by the Project. Most of the West Campus Development District is currently devoid of building or structures, including along Sand Hill Road. Under this alternative, any new housing constructed in areas near Sand Hill Road could be visible from off-campus locations, depending on a number of factors related to specific development proposals, such as building placement and height, and screening provided by existing and/or proposed landscaping along Sand Hill Road. As noted above under Impact 7A.1-1, Sand Hill Road is recognized as a scenic route by the City of Palo Alto. Removal or alteration of the existing vegetation could degrade the existing visual quality of this portion of Sand Hill Road. As with the DAPER and Administrative Development District, placement of housing along Sand Hill Road could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. Any existing fields within the West Campus Development District that may be relocated elsewhere on campus for recreation and/or detention purposes would be of a similar type and scale as those that currently exist, and would not be considered features that would degrade visual character.

Other areas within the West Campus Development are currently occupied by the Central Energy Facility, the O'Donohue Family Stanford Educational Farm, the West Campus Tennis Courts, and a surface parking lot south of Searsville Road. Regardless of where new housing would be placed in the West Campus Development District under this alternative, the visual character of this area would change from low-intensity, recreation-focused to include multi-unit residential housing, that would be visible from off-campus locations. Similar to the proposed Project, development in the West Campus Development District would be designed in accordance with County and Stanford guidance and policy documents, and would be subject to review by the County through the ASA process. Therefore, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

Mitigation: None required.

Impact 7A.1-4: Additional Housing Alternative A could create a new source of substantial light or glare that would adversely affect nighttime views in the area. (*Significant*)

As under the proposed Project, new housing development proposed under Additional Housing Alternative A could increase ambient light levels due to light dispersion from the new buildings, which may result in spillover lighting within the Project site or in adjacent neighborhoods, and could adversely affect nighttime views in the vicinity of the Project site. Because proposed housing development under this could be located on the periphery of the campus in the Quarry,

West Campus, DAPER, and/or East Campus Development Districts, spillover lighting from new housing may increase in off-site areas of the City of Palo Alto (and to a lesser degree in the City of Menlo Park) that border these development districts. Increased ambient light levels under this alternative compared to the proposed Project would likely be most noticeable in the West Campus and DAPER Development Districts, where no housing is proposed for those districts under the Project. Construction of additional housing in the Quarry Development District under this alternative would necessitate modifications to the *Plan for the El Camino Real Frontage* such that buildings would be located closer to El Camino Real and also would be taller, potentially resulting in increased ambient light levels compared to the Project. Construction of additional housing units in the DAPER and Administrative Development District could also necessitate modifications to the plan that would reduce building setback and height restrictions.

As under the proposed Project, Stanford guidelines and policies that address exterior lighting, lighting of paths and pedestrian areas, vehicular and roadway lighting, landscape and entryway lighting, accent lights, and building-mounted lights would be applicable to new housing proposed under this alternative. The County also reviews development proposals through the ASA or other approval processes. In order to assure that new lighting constructed under this alternative would not adversely affect nighttime view in the area, Implementation of Mitigation Measure 7A.1-4, which is the same as that identified for the proposed Project, would reduce the impact to a less than significant level. As with the proposed Project, by employing appropriate design standards, including those described in the ASA Guidelines, and minimizing the quantity of reflective material used in new construction, light and glare impacts related to lighting under this alternative would be reduced to less-than-significant levels.

> **Mitigation Measure 7A.1-4:** Stanford shall submit a lighting plan for approval by the County Planning Office, as part of an ASA review, for each development project that would include exterior light sources. The plan shall show the extent of illumination that would be projected from proposed outdoor lighting. State-of-the-art luminaries shall be used where necessary, with high beam efficiency, sharp cut-off, and glare and spill control. Upward glow shall not be allowed in residential or academic uses.
>
> **Significance after Mitigation:** Less than Significant.

Cumulative Impacts

Impact 7A.1-5: Additional Housing Alternative A, in combination with past, present, and future projects could potentially contribute to cumulative visual and scenic resource impacts. (*Significant*)

The geographic scope of potential cumulative impacts to visual and scenic resources encompasses the Stanford lands within the General Use Permit boundary and areas outside the boundary from which viewers could see the Project in conjunction with views of other projects in the cumulative scenario.

As with the proposed Project, housing development under Additional Housing Alternative A would likely not be visible from Portola Valley, Los Altos Hills, Menlo Park, or unincorporated portions of San Mateo County. Therefore, no cumulative visual and scenic resource impacts would result from this alternative combining with impacts of past, present, or reasonably foreseeable future projects within these jurisdictions.

Any potential future Stanford projects on Stanford-owned lands in Palo Alto with views of housing development constructed under this alternative would be similarly designed in accordance with Stanford guidance and policy documents that would limit potentially adverse visual characteristics of such projects.

Past, present, and reasonably foreseeable future projects within those areas of Palo Alto not owned by Stanford have the potential to create new visual impacts that could be affected by the Project. However, these areas are either built-out as residential neighborhoods; institutional uses that are unlikely to be altered; or border areas of Stanford along El Camino Real that are designated as Campus Open Space, and thus would not be developed under this alternative.

Therefore, the less-than-significant impacts of Additional Housing Alternative A regarding scenic vistas, or visual character would not combine with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto with views of housing development under this alternative and result in a cumulative impact for these environmental resources. Cumulative light and glare impacts would be significant pre-mitigation, but implementation of Mitigation Measure 7A.1-4 would reduce this alternative's contribution to a less than cumulatively considerable level. Projects constructed in Palo Alto would be subject to Section 18.23.030 of the City of Palo Alto Municipal Code, which includes measures to reduce off-site light spillage. Post-mitigation, the cumulative impact regarding light and glare would not be significant.

Mitigation: Implement Mitigation Measure 7A.1-4.

Significance after Mitigation: Less than Significant.

Air Quality[19]

Construction Impacts

Impact 7A.2-1: Additional Housing Alternative A construction would not result in emissions of NOx, PM, and ROGs that would exceed BAAQMD significance thresholds. (*Less than Significant*)

Construction of individual projects developed under Additional Housing Alternative A would generate construction emissions from the same variety of sources as the proposed 2018 General

[19] The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives air quality analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-AQT included in this document.

Use Permit: off-road construction equipment; and on-road worker, vendor, and hauling vehicles. Construction-related emissions from Additional Housing Alternative A were calculated using the same methodology as discussed in the Draft EIR for the proposed Project.

However, the average construction scenario for Additional Housing Alternative A assumed an annual average of approximately 360,500 square feet of new building construction (an increase of 135 housing units, or 135,000 square feet, over the proposed Project), approximately 53,840 square feet of demolition (an increase of about 3,540 square feet over the proposed Project), and excavation of approximately 144,880 of cubic yards of soil (an increase of about 82,820 cubic yards over the proposed Project).

Table 7A.2-1 presents a summary of the average daily construction-related emissions that would result under Additional Housing Alternative A under the average construction scenario. As shown in Table 7A.2-1, under the average construction scenario, emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under this alternative would be higher than the proposed Project, however, as with the proposed Project, emissions would be below the respective thresholds for these pollutants.

TABLE 7A.2-1
ADDITIONAL HOUSING ALTERNATIVE A AVERAGE DAILY CONSTRUCTION EMISSIONS

Pollutant	Average Daily Emissions (pounds/day)			
	ROG	NOx	Exhaust PM_{10}[a]	Exhaust $PM_{2.5}$[a]
	Average Construction Scenario			
2018 General Use Permit Emissions	14.9	22.0	2.8	1.3
Additional Emissions under Additional Housing Alternative A	8.7	17.6	0.5	0.3
Total Additional Housing Alternative A Emissions	23.5	39.6	3.3	1.6
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No

NOTE:
[a] Exhaust PM for the Project average and peak construction scenarios includes tire wear and brake wear PM for on-road vehicles. The BAAQMD Thresholds do not include these sources so the comparison is conservative.

SOURCE: Ramboll, 2018 (see Appendix ALT-AQT)

Additional Housing Alternative A would have more total construction than the proposed Project. However, peak construction under both the proposed Project and Additional Housing Alternative A would be less than the scope and size of the Escondido Village project authorized under the 2000 General Use Permit, which served as the basis for the peak construction scenario analyzed in this EIR. The largest new housing site under Additional Housing Alternative A would be the site at Quarry Road, which is assumed to accommodate a total of 1,100 new faculty/staff units at about 1,100,000 square feet of building development. The Escondido Village project consists of approximately 3 million square feet of building development, including structured parking and housing replacement space. Thus, even if the largest new housing complex under Additional

Housing Alternative A were constructed over a duration similar to the Escondido Village project, the peak square footage would remain lower than the peak construction scenario analyzed in the Draft EIR. Consequently, as a conservative approach for Additional Housing Alternative A, and similar to the conservative approach taken for the proposed Project, the construction emissions for the peak construction year for this alternative are assumed to be consistent with that of the Escondido Village project. As a result, under the peak construction scenario for Additional Housing Alternative A, emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under this alternative would be similar to the proposed Project, and would be below the respective thresholds for these pollutants.

Therefore, as under the proposed Project, the construction-related criteria air pollutant emissions under Additional Housing Alternative A would be less than significant.

Mitigation: None required.

Impact 7A.2-2: Additional Housing Alternative A construction would generate fugitive dust that could result in a localized increase in particulate matter. (*Significant)*

Similar to the proposed 2018 General Use Permit, demolition, excavation, grading, and other construction activities associated with individual projects developed under Additional Housing Alternative A may cause wind-blown dust that could contribute PM into the local atmosphere. Since that there would be an increase in total construction under this alternative compared to the proposed Project, there would be a corresponding increase in dust-generating activities under this alternative as well. As under the proposed Project, construction-related dust emissions under this alternative would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, dust generated from construction activities may result in significant adverse impacts on a temporary and intermittent basis during the construction period.

The BAAQMD's recommended approach to analysis of construction-related particulate impacts (other than exhaust PM) is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. The BAAQMD considers construction-related fugitive dust impacts of projects to be less than significant if a suite of recommended dust-control measures is implemented. Therefore, implementation of the BAAQMD-identified Best Management Practices for control of fugitive dust, the same mitigation as identified for the proposed Project, would reduce construction effects from fugitive dust generation under this alternative to a less than significant level.

Mitigation Measure 7A.2-2: *Best Management Practices for Controlling Particulate Emissions.* Stanford shall require all construction contractors to implement the following measures:

- All exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day;

- All haul trucks transporting soil, sand or other loose material off-site shall be covered;
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweepers is prohibited;
- All vehicle speeds on unpaved roads shall be limited to 15 mph;
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. Clear signage shall be provided for construction workers at all access points;
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible emissions evaluator; and
- Post a publicly visible sign with the telephone number and person to be contacted regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Less than Significant.

Impact 7A.2-3: Additional Housing Alternative A construction would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

Site preparation activities, such as demolition, excavation, grading, foundation construction, and other ground-disturbing construction activities associated with individual projects developed under Additional Housing Alternative A would affect localized air quality. Emissions from construction equipment during these site preparation activities would include directly emitted particulate matter ($PM_{2.5}$ and PM_{10}) and TACs such as diesel particulate matter (DPM). The generation of these emissions during construction could expose sensitive receptors to substantial pollutant concentrations of TACs, resulting in a localized health risk. Given that there would be an increase in total construction activities, and an increase in total on-campus sensitive receptors, under this alternative compared to the proposed 2018 General Use Permit, this alternative would have a greater potential to expose sensitive receptors to substantial pollutant concentrations or health risks than the proposed Project.

Similar to the proposed Project, it is not possible to conduct a health risk assessment (HRA) for construction related to each individual project that would occur under Additional Housing Alternative A. Accordingly, the same screening tool that was developed for the proposed 2018 General Use Permit to ensure future construction activities would not result in emissions of toxic

air contaminants exceeding BAAQMD health risk significance thresholds would similarly be applicable to Additional Housing Alternative A.[20] The screening tool provides minimum distances to site new projects depending on size and proximity to sensitive receptors such as children.

Table 7A.2-2 presents the screening distances developed to determine the circumstances in terms of construction project size and distance from receptors under which a significant construction-related health risk may occur. As under the proposed Project, although the precise location of future individual projects under this alternative is not known, because construction projects could occur closer to sensitive land uses than the screening distances shown in Table 7A.2-2, this alternative could result in a significant health risk impact.

TABLE 7A.2-2
CONSTRUCTION HEALTH RISK SCREENING DISTANCES

Maximum Project Size	Minimum Distance (feet) to Nearest Receptor Type[a]		
	Childcare Facility	Child Resident	Adult Resident
3.27 million square feet with up to 900,000 CY of debris/soil export	460	165	33
540,000 square feet with up to 150,000 CY of debris/soil export	165	33	33
180,000 square feet with up to 50,000 CY of debris/soil export	100	33	33
45,000 square feet with up to 12,500 CY of debris/soil export	33	33	33

NOTES:
[a] The screening tool stipulates that a 33-foot buffer must exist around the construction site fence line where no sensitive receptor resides. If a construction site is within the 33-foot buffer from sensitive receptors, or directly adjacent to a childcare facility, the project must both comply with the screening limits presented above and restrict diesel-powered operations to when children are not present in order to screen out of conducting a health risk analysis.

SOURCE: Ramboll Environ, 2017 (see Draft EIR Appendix AQT)

Implementation of **Mitigation Measure 7A.2-3(a)**, the same mitigation identified for the proposed Project, would require Stanford to conduct a health risk screening of individual projects developed under the proposed 2018 General Use Permit. If applicable, **Mitigation Measure 7A.2-3(b)**, also the same as identified for the proposed Project, would require a project-specific health risk analysis to demonstrate that the project construction activities would not result in a significant acute, chronic non-cancer or cancer-related health risk to specific sensitive receptors. Implementation of Mitigation Measures 7A.2-3(a)-(b) would ensure potential exposure of sensitive receptors to substantial pollutant concentrations or health risk from construction activities under the Additional Housing Alternative A would be less than significant.

[20] The screening tool is based on the EV Graduate Residences project, which reflects the largest quantity of earth moving and the largest amount of above and below ground construction that Stanford has undertaken for a single project under the 2000 General Use Permit. The EV Graduate Residences construction project is likely to be larger than any individual project that would be constructed under either the proposed 2018 General Use Permit, or this alternative.

Mitigation Measure 7A.2-3(a): *Health Risk Screening for Construction Projects.* Prior to approval of an individual project, Stanford shall conduct a project-specific health risk screening using the screening distances presented in Table 7A.2-2 and submit it to the County Planning Office for peer review and approval. If the individual project is located further from sensitive receptors than the minimum distance identified in Table 7A.2-2, then no further construction health risk assessment or additional mitigation is required. If the construction project is closer than the specified minimum distance, then a project-specific Health Risk Assessment shall be prepared, as outlined in Mitigation Measure 7A.2-3(b).

Mitigation Measure 7A.2-3(b): *Project-Specific Health Risk Analysis.* If the screening criteria in Table 7A.2-2 are not met, Stanford shall prepare and submit to the County Planning Office for peer review and approval a project-specific health risk analysis demonstrating that project construction activities will not result in a significant acute, chronic non-cancer or cancer-related health risk to sensitive receptors. As a performance standard, any subsequent project-specific health risk analysis must demonstrate an excess cancer risk level of 10-in-1 million or less, a non-cancer (i.e., chronic or acute) hazard index of 1.0 or less, and an incremental increase an annual average $PM_{2.5}$ concentration of no more than 0.3 microgram per cubic meter.

Significance after Mitigation: Less than Significant.

Operational Impacts

Impact 7A.2-4: Additional Housing Alternative A operational emissions from new development would result in emissions of criteria air pollutants (PM_{10}) at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. (*Significant)*

Similar to the proposed Project, Additional Housing Alternative A would generate operational emissions from a variety of sources, including new vehicle trips, operation of boilers, maintenance operation of diesel emergency generators; new laboratories; fueling stations; and off-road sources from Stanford maintenance equipment and construction activities. Additional Housing Alternative A would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in criteria air pollutants compared to the proposed Project.

An air quality analysis of Additional Housing Alternative A is included in Appendix ALT-AQT, and includes a detailed inventory of operational emissions of this alternative. The operational criteria air pollutant inventory analysis for Additional Housing Alternative A used the same methodology that was developed for the proposed Project for all sources except entrained road dust from vehicle trips. These analytical methods include use of the same USEPA emission factors to estimate emissions from emergency generators and boilers, and the same EMFAC2014 emission factors from CARB to estimate emissions for vehicle trips. However, for entrained road dust, localized Santa Clara County-specific emission factors were applied using Method 7.9 of the California Air Resources Board and applied to the 2018 baseline, buildout of the proposed Project, and the additional housing alternative scenarios. Consequently, baseline and proposed

Project values for PM_{10} and $PM_{2.5}$ reported below are slightly different than what was reported in the Draft EIR.[21]

Table 7A.2-3, below, presents the net change in maximum annual and average daily criteria air pollutant emissions in the study area between the 2018 baseline and 2035 with buildout of Additional Housing Alternative A. Similar to the proposed Project, emissions of ROG and NOx would decrease by 2035 compared to the 2018 environmental baseline, largely as a result of improvements to the motor vehicle fleet due to more stringent emission standards; as well as the proposed electrification of Stanford's Marguerite bus fleet and 70 percent of its Lands, Buildings and Real Estate (LBRE) and Bonair vehicle fleets by 2035. Emissions of PM_{10} and $PM_{2.5}$ under this alternative are predicted to increase due primarily to entrained dust emissions associated with increased Vehicle Miles Traveled (VMT).

As shown in Table 7A.2-3, emissions of ROG, NOx, and $PM_{2.5}$ for Additional Housing Alternative A would all be below BAAQMD thresholds. However, the increase in emissions of PM_{10} under this alternative would exceed the BAAQMD threshold of 82 pounds per day and 15 tons per year. Mobile sources would be responsible for 94 percent of the increase in PM_{10} emissions under this alternative. Therefore, operational emissions of PM_{10} under Additional Housing Alternative A would result in a significant impact. This is a different finding of significance than was identified for the proposed Project, which was determined to have a less than significant operational PM_{10} emission impact as a result of comparatively less VMT. Table 7A.2-3 also compares emissions under Additional Housing Alternative A to those generated by the proposed 2018 General Use Permit, with emissions ranging from 8 to 17 percent greater under Additional Housing Alternative A, depending on pollutant.

Under this alternative, similar to the proposed Project, Stanford would convert the majority of its campus fleet vehicles to electric vehicles, and install electric vehicle charging stations to encourage the use of private zero-emission vehicles.[22] However, Stanford cannot control the mode of propulsion used in private vehicles.

Additionally, under this alternative, and similar to the proposed Project, Stanford would to be subject to its "No Net New Commute Trips" standard. Stanford currently achieves the standard through a range of approaches that currently include implementation of its Transportation Demand Management (TDM) programs and participation in off-campus trip reduction programs. Under this alternative, similar to the proposed Project, an additional approach would include funding trip reduction programs that that encourage and improve use of alternative transportation modes and/or improve mobility for pedestrians, bicyclists and transit users. These approaches are formalized in **Mitigation Measure 7A.15-2(a)** under Transportation and Traffic, below. Mitigation Measure 7A.15-2(a) would also serve the purpose to reduce mobile emissions,

[21] The operational mobile emissions presented in the Draft EIR Appendix AQT included vehicle emissions from the EMFAC2014 model, which contains PM_{10} and $PM2_{.5}$ from exhaust, brakewear, and tirewear, but not roadway dust. BAAQMD subsequently clarified that roadway dust should be included in the emissions to compare to the operational thresholds. The inclusion of roadway dust in proposed Project operational mobile emissions did not change any significance conclusions included in Table 7B.2-3 in the Draft EIR for the proposed Project.

[22] Electric vehicles emit zero PM_{10} exhaust, although they still produce brake wear, tire wear, and entrained roadway dust that contribute to total PM_{10} emissions.

including $PM_{10,}$ under this alternative to the extent the No Net New Commute Trips standard is achieved. However, this is considered a significant and unavoidable impact because it is uncertain whether this measure would reduce mobile PM_{10} emissions below the significance threshold. As explained under the Additional Housing Alternative A Description, because this alternative would shift a substantial number of commute trips to residential trips, the No Net New Commute Trips standard may not be achieved because travel demand management (TDM) measures are not as effective in reducing residential trips, compared to commute trips.

TABLE 7A.2-3
NET CHANGE IN MAXIMUM ANNUAL AND AVERAGE DAILY OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS UNDER ADDITIONAL HOUSING ALTERNATIVE A

Pollutant:	ROG	NOx	PM_{10}	$PM_{2.5}$[a]
Maximum Annual Emissions (Tons Per Year)				
Total 2018 Baseline Emissions[c]	47	82	33[c]	10[c]
Total Emissions in 2035 with Buildout of Additional Housing Alternative A	45	53	49	14
Net Change in Emissions of Additional Housing Alternative A Compared to Baseline[b]	-2	-29	+16	+4
Threshold	10	10	15	10
Above Threshold?	No	No	**Yes**	No
Total Emissions in 2035 with Buildout of proposed 2018 General Use Permit[c]	40	49	42[c]	12[c]
Increase in Emissions of Additional Housing Alternative A over proposed 2018 General Use Permit [b]	+5	+4	+7	+2
Average Daily Emissions (Pounds Per Day)				
Total 2018 Baseline Emissions [c]	256	447	181[c]	55[c]
Total Emissions in 2035 with Buildout of Additional Housing Alternative A	246	288	269	76
Net Change in Emissions of Additional Housing Alternative A Compared to Baseline [b]	-10	-159	+88	+22
Threshold	54	54	82	54
Above Threshold?	No	No	**Yes**	No
Total Emissions in 2035 with Buildout of proposed 2018 General Use Permit [c]	220	270	232[c]	68[c]
Increase in Emissions of Additional Housing Alternative A over proposed 2018 General Use Permit[b]	+26	+19	+37	+9

NOTES:
[a] $PM_{2.5}$ from non-mobile sources conservatively assumed to be equivalent to PM_{10} value.
[b] Emission totals may not appear to total due to rounding.
[c] 2018 Baseline and buildout of proposed 2018 General Use Permit values for PM_{10} and $PM_{2.5}$ presented here are different than those reported in the Draft EIR, as the values in this table reflect more recently available emission factors published in 2017.

SOURCE: Ramboll, 2018 (see Appendix ALT-AQT)

Mitigation: Implement Mitigation Measure 7A.15-2(a).

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.2-5: Additional Housing Alternative A operation of development would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant*)

Similar to the proposed 2018 General Use Permit, Additional Housing Alternative A would result in development that would generate operational emissions of TACs and localized contributions to $PM_{2.5}$ concentrations from a variety of sources, including emissions from passenger vehicles and delivery vehicles, diesel generators, laboratory fume hood stacks and, to a lesser extent, natural gas combustion. Given that there would be an increase on-campus sensitive receptors, under this alternative compared to the proposed 2018 General Use Permit, this alternative would have a greater potential to expose sensitive receptors to substantial pollutant concentrations or health risks than the proposed Project.

Mobile Source Air Toxics

Mobile source air toxics are emitted from vehicles and are compounds that are known or suspected to cause cancer or other serious health and environmental effects. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter (DPM). TAC emissions from mobile sources would be reduced under this alternative compared to 2018 environmental baseline conditions, resulting in a reduction of health risks from mobile sources.

As discussed in Impact 7A.2-4, Additional Housing Alternative A would result in a marginal increase in $PM_{2.5}$ emissions, and incrementally more than the proposed Project. This would be a basin-wide increase primarily resulting from non-exhaust emissions resulting from increased VMT. Using traffic volumes on El Camino Real as a proxy and the BAAQMD's screening calculator for roadway emissions, the predicted increase in vehicles along El Camino Real under this alternative would result in an increased $PM_{2.5}$ concentration of 0.04 μg/m3 at 100 feet (or 0.02 μg/m3 more than the proposed Project). This increase is below BAAQMD's significance threshold of 0.3 μg/m3 for project-level contributions to localized concentrations of $PM_{2.5}$. Consequently, similar to the proposed Project, Additional Housing Alternative A is considered to have a less-than-significant impact with regard to health risks from mobile sources.

Diesel Emergency Back-up Generators Air Toxics

Similar to the proposed Project, new diesel emergency back-up generators would be required for some buildings constructed under Additional Housing Alternative A as a safety requirement. Any new diesel generators larger than 50 horsepower would require a permit from the BAAQMD and must comply with the Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines. As a practical matter, the BAAQMD will not issue a permit for a new generator that results in an operational cancer risk greater than 10 in one million. Accordingly, and similar to the

proposed Project, health risk impacts from new emergency generators under this alternative would be considered less than significant.

Laboratory Air Toxics

Because Additional Housing Alternative A would not change the allocation for development of academic space compared to the proposed Project, there would be no increase in on-campus laboratory development, or chemical usage associated with those uses, under this alternative compared to the proposed Project, although as noted above, there would be a larger on-campus residential population.

TAC emissions dispersion predicted the incremental increase in cancer risk associated with the Project was estimated to be 4.5 in one million, which is well below the BAAQMD significance threshold of 10 in a million. The risk under Additional Housing Alternative A would be the same as for the proposed Project since there would be no additional laboratories under this alternative. As under the proposed Project, under this alternative acute and chronic hazard indices (HIs) would increase by 0.03 and 0.01, respectively, which are also below the BAAQMD significance threshold of 1.0. Therefore, as under the proposed Project, impacts on health risks from laboratory TAC emissions under this alternative would similarly be less than significant.

Similar to the proposed Project, limitations of the health risk assessment prepared at this stage may not account for development under Additional Housing Alternative A that may involve substantial amounts of laboratory space and fume hoods. BAAQMD's Rule 2-1 exempts teaching laboratories used exclusively for classroom experimentation and/or demonstration. Given the potential for future development under Additional Housing Alternative A to include both teaching laboratories as well as research laboratories, the potential exists that the requirements of Rule 2-1 may not apply. Consequently, similar to the proposed Project, the potential health risks from laboratory TAC emissions under Additional Housing Alternative A is considered significant. Accordingly, **Mitigation Measure 7.2-5**, the same mitigation proposed for the Project, is identified to ensure that substantial amounts of laboratory space under this alternative would not result in a significant health risk.

Natural Gas Combustion

Natural gas combustion results in emissions of benzene, formaldehyde, and toluene. Under Additional Housing Alternative A, there would be an incremental increase in these TAC emissions due to an increase in natural gas combustion associated with residential and non-residential growth. However, these increases under this alternative compared to the 2018 baseline would be marginal [net change of 0.35 lb/yr of benzene (an incremental increase of 0.06 lb/yr over the proposed Project), 12.2 lb/yr of formaldehyde (an incremental increase of 2.0 lb/yr over the proposed Project), and 0.54 lb/yr of toluene (an incremental increase of 0.10 lb/yr over the proposed Project], and any new natural gas boilers would need to be permitted and comply with any applicable BAAQMD standards (Appendix ALT-AQT). Therefore, health risk impacts from natural gas combustion resulting from development under Additional Housing Alternative A would be similar to those under the proposed project, and similarly, would be less than significant.

Mitigation Measure 7A.2-5: *Laboratory Fume Hood Emission Control*. For any individual project that contains more than 25,000 square feet of emissions-generating laboratory space within a building and 50 fume hoods, Stanford shall conduct a health risk screening analysis and obtain a permit from the BAAQMD for the proposed individual project; this permit may be required either prior to or as a condition of approval of the proposed individual project. In accordance with BAAQMD Rules 2-1 and 2-5, new sources of emissions must implement Best Available Control Technology for Toxics (T-BACT) if individual source risks exceed 1.0 in a million for cancer and/or chronic hazard index is greater than 0.20. Additionally, a permit will be denied if project cancer risk exceeds 10.0 in a million or if the chronic or acute hazard index exceeds 1.0. Compliance with BAAQMD rules will ensure that new laboratory operations will not result in a significant health risk impact.

Significance after Mitigation: Less than Significant.

Impact 7A.2-6: Additional Housing Alternative A operations would not result in local concentrations of carbon monoxide that would exceed State and federal standards. (*Less than Significant*)

Development under Additional Housing Alternative A would generate additional vehicle trips (over baseline and Project conditions) and associated emissions of CO along area roadways. BAAQMD provides a screening methodology based on peak hourly traffic volumes to evaluate potential impacts of CO emissions from mobile sources (BAAQMD *CEQA Air Quality Guidelines*, Updated May 2017). This preliminary screening procedure provides a conservative indication of whether the proposed Project would result in the generation of CO concentrations that would substantially contribute to an exceedance of the thresholds of significance. If all of the screening criteria are met, the proposed Project would result in a less-than-significant impact to air quality with respect to concentrations of local CO.

The screening methodology focuses on intersections with vehicle traffic exceeding 44,000 vehicles per hour after Project buildout (or 24,000 vehicles per hour in locations with limited vertical or horizontal air mixing) that could violate or contribute to a violation of ambient air quality standards for CO. Based on the study intersection analysed in Section 7.15, Transportation and Traffic, indicates that with buildout of Additional Housing Alternative A in 2035, the greatest total intersection volumes would occur at the intersection of Page Mill Road with El Camino Real during the p.m. peak hour with 8,765 vehicles (an increase of less than 200 vehicles over the proposed Project). With buildout of Additional Housing Alternative A in 2035, all study intersection volumes would be below the 24,000 vehicles per hour screening threshold. Thus, similar to the proposed Project, Additional Housing Alternative A would not contribute to a violation of CO air quality standards.

Mitigation: None required.

Impact 7A.2-7: Additional Housing Alternative A operation of development would not create objectionable odors that would affect a substantial number of people. (*Less than Significant*)

The BAAQMD CEQA Guidelines identifies wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations and metal smelters as odor sources of particular concern, recommends buffer zones of one to two miles around them to avoid potential odor conflicts, and requires a BAAQMD permit. There are no facilities of these types in the vicinity of the Project site, and similar to the Project, none are proposed or allowed under Additional Housing Alternative A. As under the proposed Project, Additional Housing Alternative A would provide for the development of new housing, academic, and academic support uses, and would not result in the development or operations of odor sources of concern. Consequently, similar to the proposed Project, the potential for Additional Housing Alternative A to result in objectionable odors is less than significant.

Mitigation: None required.

Impact 7A.2-8: Additional Housing Alternative A operation of development could conflict with or obstruct implementation of the applicable air quality plan. (*Significant)*

In April 2017 the BAAQMD adopted the *2017 Clean Air Plan* (BAAQMD, 2017d). The 2017 Clean Air Plan's primary goals are to protect public health and protect the climate, and it contains 85 measures some of which address reduction of GHGs. The 2017 BAAQMD CEQA Guidelines identify a methodology to assess consistency with the Clean Air Plan be used to evaluate plan-level projects. Specifically, the 2017 BAAQMD CEQA Guidelines recommend the consideration of three questions:

- Does the project support the primary goals of the air quality plan?;
- Does the project include applicable control measures from the air quality plan?; and
- Does the project disrupt or hinder implementation of any Clean Air Plan control measures?

With regard to the first question, the BAAQMD CEQA Guidelines provide a basis for assessing support of the primary goals. The primary goals of the 2017 Bay Area Clean Air Plan are to:

- Attain all state and national air quality standards;
- Eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and
- Reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.

Any project (i.e., project or plan) that would not support these goals would not be considered consistent with the 2017 Clean Air Plan. If approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the 2017 Clean Air Plan. Based on the discussion presented in

Impact 7A.2-4 above, development under Additional Housing Alternative A would have a significant and unavoidable impact with regard to operational emissions of PM_{10}. Because Additional Housing Alternative A would be located in a region designated as non-attainment for state of California Standards for PM_{10} and as indicated in Table 5.2-1 of the Draft EIR, in an area that has experienced regular exceedances of the state PM_{10} standard, this alternative's significant and unavoidable operational PM_{10} impact is deemed inconsistent with the 2017 Clean Air Plan's goal of attaining the state air quality standards, and therefore, Additional Housing Alternative A would be considered inconsistent with the 2017 Clean Air Plan. This finding is not the same as under the proposed Project, which did not have a significant operational PM_{10} impact (see Impact 5.2-4 in the Draft EIR).

The second question recommended in the 2017 BAAQMD CEQA Guidelines for evaluating consistency with the 2017 Clean Air Plan is whether the project includes applicable control measures from the air quality plan. The 2017 Clean Air Plan contains transportation control measures and measures related energy, green building, waste management, water control and control of short-lived GHGs. The measures applicable to criteria air pollutants, TACs, or greenhouse gases generated under Additional Housing Alternative A are the same as those identified for the proposed 2018 General Use Permit in **Table 5.2-11** of the Draft EIR. As discussed in Chapter 3, Project Description, in the Draft EIR, Stanford currently implements a number of programs and practices to promote sustainability at the campus, including Transportation Demand Management, energy supply and efficiency, water supply and conservation, and solid waste reduction and recycling. As with the proposed Project, under Additional Housing Alternative A, Stanford would commit to continue to implement, and update as needed, these sustainability programs and practices.

These mechanisms would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. As with the proposed Project, there are some control measures with which Additional Housing Alternative A, as proposed, may not be consistent. Where an implementation mechanism does not currently exist or is not identified in Additional Housing Alternative A, mitigation measures identified in the EIR are identified to ensure consistency of Additional Housing Alternative A with the 2017 Clean Air Plan. With elements identified as part of Additional Housing Alternative A, and implementation of mitigation measures identified in this EIR, this alternative would be consistent with applicable control measures from the 2017 Clean Air Plan, similar to the proposed Project.

The final basis for evaluation of consistency with the 2017 Clean Air Plan is whether Additional Housing Alternative A would disrupt or hinder implementation of any 2017 Clean Air Plan control measure. With elements identified as part of the proposed 2018 General Use Permit, along with implementation of mitigation measures identified in this EIR, Additional Housing Alternative A would not adversely affect implementation of any 2017 Clean Air Plan control measure. This is the same finding as under the proposed Project.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7A.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 7A.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 7A.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 7A.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Significant and Unavoidable.

While the above-identified mitigation measures would address potential inconsistencies of Additional Housing Alternative A with respect to the absence of several relevant control measures of the 2017 Clean Air Plan, these measures would not address Additional Housing Alternative A's inconsistency with the Plan's goal of attaining the state air quality standards. Significant PM_{10} emissions associated with Additional Housing Alternative A would be the result of regional increases in VMT which could only be addressed through trip reduction measures. As discussed in Mitigation Measure 7A.15-2(a) in the Transportation and Traffic section, Stanford would mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, the former of which has the potential to reduce VMT. However, as discussed under the description of Additional Housing Alternative A, the No Net New Commute Trips standard may not be achieved for this alternative through travel demand management (TDM) measures as TDM measures would not be as effective in reducing residential trips associated with this alternative, compared to commute trips. Consequently, the PM_{10} impact under Additional Housing Alternative A is conservatively identified as significant and unavoidable.

Cumulative Impacts

Impact 7A.2-9: Additional Housing Alternative A would not result in emissions of NOx, $PM_{2.5}$, or ROGs that are cumulatively considerable, but would result in emissions of PM_{10} that would be cumulatively considerable. (*Significant)*

BAAQMD developed thresholds of significance for both construction and operation with consideration of individual project emission levels that would be cumulatively considerable. If a project exceeds the identified project significance levels, then its emissions would be cumulatively considerable. Table 7A.2-3 shows that operational emissions under Additional Housing Alternative A would exceed emission thresholds for PM_{10}. Therefore, emissions of PM_{10} from Additional Housing Alternative A would result in a cumulatively considerable contribution to a cumulative air quality impact. This is a different finding of significance than was identified for the proposed Project, which had a less than significant operational emission impact as a result of comparatively less VMT.

Mitigation: Implement the following mitigation measure:

Mitigation Measure 7A.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements to fund transportation mitigation efforts.*

Significance after Mitigation: Significant and Unavoidable.

As discussed above, significant PM_{10} emissions associated with Additional Housing Alternative A would be the result of regional increases in VMT which could only be addressed through trip reduction measures. As discussed in Mitigation Measure 7A.15-2(a) in the Transportation and Traffic section, Stanford would mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, the former of which has the potential to reduce VMT. However, as discussed under the description of Additional Housing Alternative A, the No Net New Commute Trips standard may not be achieved for this alternative through travel demand management (TDM) measures as TDM measures would not be as effective in reducing residential trips associated with this alternative, compared to commute trips. Consequently, the PM_{10} impact under Additional Housing Alternative A is conservatively identified as significant and unavoidable.

Impact 7A.2-10: Additional Housing Alternative A could considerably contribute to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

As discussed in Impact 7A.2-3, because construction projects developed under Additional Housing Alternative A could occur closer to sensitive land uses than the screening distances shown in Table 7A.2-2, Additional Housing Alternative A could result in a significant health risk impact, similar to the proposed Project. Additionally, as discussed in Impact 7A.2-5, as with the proposed Project, the health risks from TACs from operation of laboratories under this alternative are considered significant. Similar to the proposed Project, these represent impacts where the contribution of Additional Housing Alternative A could also be cumulatively considerable. Consequently, mitigation measures are identified for Additional Housing Alternative A, the same mitigation as that identified for the proposed Project, to address these impacts of Additional Housing Alternative A.

Under the Community Air Risk Evaluation (CARE) program, the BAAQMD identified communities in the Bay Area subject to high TAC emissions, with sensitive populations that could be affected by them. The most recent CARE retrospective document indicates that there are no cumulatively impacted communities within five miles of the Project site. Similar to the proposed Project, given that Additional Housing Alternative A contributions to localized health risk would be less than significant with mitigation, as described in Impact 7A.2-3 and Impact 7A.2-5 for both construction and operations, and that there are no impacted CARE communities in the Project vicinity, Additional Housing Alternative A cumulative impact to local health risk and hazards would be reduced to less than cumulative considerable, and therefore a less than significant level with identified mitigation.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7A.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Mitigation Measure 7A.2-5: *Laboratory Fume Hood Emission Control*

Significance after Mitigation: Less than Significant.

Biological Resources

Construction and Operational Impacts

Impact 7A.3-1: Additional Housing Alternative A activities could result in adverse effects on special-status and migratory birds. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction under this alternative, tree and shrub pruning or removal, or grading could directly impact nesting birds by damaging or destroying nests, causing adults to abandon nests, or directly killing or injuring nesting birds. Additionally, construction activity, such as elevated sound levels and vibrations from heavy construction equipment, could cause adult birds to abandon nests. Due to the greater level of on-campus construction and larger development footprint under this alternative, there would be a greater potential for these impacts to occur than under the proposed Project. Similar to the proposed Project, implementation of this alternative could result in significant impacts to special-status and migratory birds.

As with the proposed Project, indirect effects to birds under this alternative would be unlikely during operation of facilities because birds nesting in or near existing campus buildings and facilities would most likely be acclimated to the noise and activity associated with campus activity. Consequently, similar to the proposed Project, operational impacts on nesting birds under this alternative would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce impacts of construction on nesting birds, including raptors and other migratory bird species protected by the MBTA, to a level that is less than significant. If Mitigation Measure 7A.3-1(a) is implemented, no further mitigation measures are required. In the event that Mitigation Measure 7A.3-1(a) cannot feasibly be implemented, then implementation of Mitigation Measures 7A.3-1(b) through (e) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 7A.3-1(a):** *Avoid tree removal and commencement of outdoor construction activities during nesting season.* Tree removal or pruning associated with project construction and commencement of outdoor project construction activities shall be avoided from February 1 through August 31, the primary local bird nesting season, to the extent feasible. If no tree removal or pruning associated with project construction is proposed during the nesting period and outdoor project construction activities will commence outside the nesting period, no surveys for active bird nests are required.

Or

Mitigation Measure 7A.3-1(b): *Survey for active bird nests within 250 feet of construction sites.* If the County Planning Office determines that compliance with Mitigation Measure 7A.3-1(a) is not feasible because the timing of a construction project necessitates construction-related tree removal/pruning during the nesting season and/or commencement of outdoor construction activities during the nesting season, within seven days prior to the proposed start of construction activities an independent, qualified biologist approved by the County shall conduct a nesting bird survey of all potential habitat at the construction site and within 250 feet of the perimeter of the construction site. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 7A.3-1(c): *Minimize impacts to active bird nests.* If any active nests are detected during the pre-construction survey, an independent, qualified biologist approved by the County shall recommend a work-exclusion buffer zone that shall be designated around the active nest to allow for both the successful fledging of the birds and initiation of work on some portions of the project site. The work-exclusion zone(s) shall be reviewed and approved by the County Planning Office prior to commencement of construction. A qualified biologist shall monitor any occupied nest located within a protective buffer zone in order to determine if the designated buffer zone is effective and when the buffer zone is no longer needed. If the buffer zone is determined to be ineffective, its size shall be increased until it is effective, or work shall cease until the young have fledged and are independent of the nest.

Mitigation Measure 7A.3-1(d): *Delay activity***.** If no sufficient work-exclusion zone(s) are possible, then there shall be a delay in the start of construction until the active nest is no longer occupied. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used.

Mitigation Measure 7A.3-1(e): *Remove nest starts.* A qualified biologist can visit project sites at any time prior to tree removal or the initiation of outdoor construction work in order to find and remove nest starts which do not have eggs or nestlings present. This activity will minimize impacts to birds as they will generally move elsewhere and restart their nest building process.

Significance after Mitigation: Less than Significant.

Impact 7A.3-2: Additional Housing Alternative A activities could result in adverse effects on special-status bats. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on infill and redevelopment sites, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction of individual projects under this alternative, activities such as building demolition, tree and shrub removal, grading, and new building construction could directly impact roosting special-status bats, and elevated sound levels from heavy construction equipment could cause adult bats to abandon maternity roosts. Due to

the greater level of on-campus construction activity under this alternative compared to the proposed Project, there would be the potential for more disturbance to bats to occur under this alternative. Similar to the proposed Project, construction activities under this alternative could result in significant impacts to special-status bats.

As with the proposed Project, indirect effects to bats during operation of facilities under this alternative would be unlikely because bats roosting in or near existing campus facilities would be acclimated to light, noise and activity associated with campus operations. Consequently, similar to the proposed Project, operational impacts on special-status bats would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce construction impacts on special-status bats to a level that is less than significant. If Mitigation Measure 7A.3-2(a) is implemented, and no roosting bats are identified, no further mitigation measures are required. In the event that Mitigation Measure 7A.3-2(a) identifies roosting bats, then implementation of Mitigation Measures 7A.3-2(b), (c), and/or (d) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 7A.3-2(a):** *Conduct pre-project survey.* Prior to project construction, an independent, qualified bat biologist approved by the County shall conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be demolished within the work area and within a 50-foot radius of the work area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. If no roosting bats are found, no further action is required. If a bat roost is found, Stanford shall implement the following measures to avoid impacts on roosting bats.
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> **Mitigation Measure 7A.3-2(b):** *Evict non-maternal roosts.* If a non-maternal roost of bats is found in a tree or structure to be removed or demolished as part of project construction, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Removal or demolition should occur no sooner than at least two nights after the initial minor site modification (to alter airflow). This action allows bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of disturbance. Departure of the bats from the construction area shall be confirmed with a follow-up survey by a qualified bat biologist prior to start of construction.
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> **Mitigation Measure 7A.3-2(c):** *Avoid maternal roosting areas.* If active maternity roosts are found in trees or structures that will be removed or demolished as part of project construction, tree removal or demolition of that structure shall commence and be completed before maternity colonies form (generally before March 1) or shall not commence until after young are flying (generally after July 31). Active maternal roosts shall not be disturbed.
>
> **Mitigation Measure 7A.3-2(d):** *Develop and employ bat nest box plan.* If special-status bats are found in trees or structures to be removed or demolished as part of project construction, Stanford shall develop and implement a Bat Nest Box Plan for the Stanford campus employing current bat nest box technology. The design and placement of nest boxes shall be reviewed by an independent, qualified bat biologist and shall be consistent with Stanford's anticipated long-term planning and development activities.

Significance after Mitigation: Less than Significant.

Impact 7A.3-3: Additional Housing Alternative A activities could result in adverse effects on the San Francisco dusky-footed woodrat. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction of individual projects under this alternative, construction activities in wooded or brushy habitats could result in direct impacts to dusky-footed woodrats. As with the proposed Project, direct impacts during construction of this alternative could include mortality of adults or young, as well as destruction of woodrat stick nests where construction takes place in the Lathrop or Lagunita Development Districts. It should be noted that none of the additional housing proposed under this alternative would be located within the Lathrop or Lagunita Development Districts; consequently, this alternative would have similar impacts to the dusky-footed woodrats in these areas as the proposed Project. Similar to the proposed Project, construction activities associated with this alternative could result in significant impacts to San Francisco dusky-footed woodrat.

As with the proposed Project, indirect impacts to dusky-footed woodrat due to increased predation caused by expanding the range of urban-adapted predators would not occur because development of new academic and academic support and residential uses within the Academic Growth Boundary would occur in an urban environment, where these predator species are already present. Similarly, this alternative would not introduce increased nighttime lighting, noise or other human disturbances in areas where such conditions do not already exist. Consequently, similar to the proposed Project, operational impacts on the dusky-footed woodrat under this alternative would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce the impacts of construction to San Francisco dusky-footed woodrats to a level that is less than significant. If Mitigation Measure 7A.3-3(a) is implemented, and no San Francisco dusky-footed woodrat nests are identified, no further mitigation measures are required. In the event that Mitigation Measure 7A.3-2(a) identifies active nests, then implementation of Mitigation Measures 7A.3-2(b) and/or (c) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 7A.3-3(a):** *Surveys.* Prior to any clearing of vegetation within the Lathrop Development District, Lagunita and adjacent uplands, jurisdictional waterways/wetlands, or lands on the Project site outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a survey for San Francisco dusky-footed woodrat nests within the project area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 7A.3-3(b): *Avoidance***.** Where feasible, an exclusion buffer of at least 10 feet from these nests shall be established and clearly demarcated to avoid moving or bumping the nests or the logs or branches on which the nests rest.

Mitigation Measure 7A.3-3(c): *Mitigation.* If establishing a buffer and avoiding the nests is not feasible, the nests shall be dismantled and the nesting material moved to a new location outside the project's impact areas so that it can be used by woodrats to construct new nests. Prior to nest deconstruction, each active nest shall be disturbed by a qualified wildlife biologist to the degree that all woodrats leave the nest and seek cover out of the impact area. Whether the nest is on the ground or in a tree, the nest shall be slightly disturbed (nudged) to cause the woodrats to flee. For tree nests, a tarp shall be placed below the nest and the nest dismantled using hand tools (either from the ground or from a lift). The nest material shall then be piled at the base of a nearby tree or large shrub outside of the impact area.

Significance after Mitigation: Less than Significant.

Impact 7A.3-4: Additional Housing Alternative A construction activities could result in adverse effects on special-status plant species. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Natural areas within the Academic Growth Boundary contain potentially suitable habitat for rare, threatened or endangered plant species. Similar to the proposed Project, during construction of individual projects under this alternative, construction activities such as grading and ground-disturbing activity in these locations could result in loss of rare, threatened or endangered plant species. As with the proposed Project, construction activities under this alternative could result in significant impacts to special-status plant species. Since the additional housing that would be developed under this alternative would be located primarily on infill and redevelopment sites, potential impacts on special-status plant species under this alternative would be similar to the proposed Project.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce impacts to special-status plant species to a level that is less-than-significant. If Mitigation Measure 7A.3-4(a) is implemented, and no special-status plant species are identified, no further mitigation measures are required. In the event that Mitigation Measure 7A.3-4(a) identifies such species, then implementation of Mitigation Measures 7A.3-4(b) and/or (c) would reduce this impact to a less-than-significant level.

Mitigation Measure 7A.3-4(a): *Surveys.* If construction is proposed within any jurisdictional waterways/wetland areas, Lagunita basin and adjacent uplands, the Lathrop Development District, or Project site lands outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a focused survey for special-status plant species prior to ground disturbance during the late winter/early spring period when most local native plant species are flowering and most easily identified. The survey results shall be provided to the County Planning Office prior to

issuance of site demolition, grading or building permits. If special status plant surveying during flowering period is not possible, development within sensitive habitat areas shall be avoided unless approved by CDFW and the County Planning Office.

Mitigation Measure 7A.3-4(b): *Avoidance.* Construction activities shall avoid impacts to special-status plant species by establishing a buffer zone around the individuals in question. The buffer size shall be determined by an independent, qualified biologist approved by the County in order to avoid potential disturbance. The width of the buffer shall depend on a consideration of site-specific characteristics, including the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, soils, physical and chemical characteristics) and adjacent uses (e.g., sprinkler irrigation or shading from buildings or other structures). The buffer zone shall be clearly demarcated using exclusion fencing.

Mitigation Measure 7A.3-4(c): *Mitigation if avoidance is not feasible.* If the County Planning Office determines that establishing an avoidance buffer is not feasible, individual plants (including seeds) shall be transplanted to an area with suitable physical and biological conditions on the Project site outside of the Academic Growth Boundary and monitored and adaptively managed for five years. Transplantation may be accomplished by relocating individual plants or through seed collection and dispersal, or a combination of both, to be determined based on the species.

Significance after Mitigation: Less than Significant.

Impact 7A.3-5: Additional Housing Alternative A activities would not result in significant effects on federal and state protected species covered by the Stanford Habitat Conservation Plan. (*Less than Significant*)

Implementation of the Stanford Habitat Conservation Plan (HCP) satisfies the requirements of both the federal and state endangered species acts. The three species covered by the Stanford HCP and incidental take permit (ITP) are: California red-legged frog (CRLF); California tiger salamander (CTS); and San Francisco gartersnake. As is the case for the proposed Project, because Stanford is required by U.S. Fish and Wildlife Service (USFWS) to implement the HCP, impacts to Covered Species from construction and operation under this alternative would be less-than-significant. Impacts under this alternative would be similar to proposed Project impacts.

Mitigation: None required.

Impact 7A.3-6: Additional Housing Alternative A activities could result in significant effects on steelhead. (*Potentially Significant*)

Steelhead are found exclusively outside the Academic Growth Boundary within the San Francisquito Creek watershed. Similar to the proposed Project, while all new academic and residential development under Additional Housing Alternative A would occur within the Academic Growth Boundary, Stanford could also construct certain infrastructure improvements,

as well as on-going habitat improvements and conservation projects, outside the Academic Growth Boundary under this alternative.

Similar for the proposed Project, the County approved a Special Conservation Area Plan that would protect steelhead from construction and operational activities at Stanford, including those activities that would occur under this alternative. As under the proposed Project, because construction of infrastructure, as well as on-going habitat improvement and conservation projects, could adversely affect steelhead by rendering habitat less hospitable in the short term due to increases in sediment loading and disturbance, construction activities under this alternative would have a significant impact on steelhead. Impacts under this alternative would be similar to proposed Project impacts.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would serve to further ensure that impacts to steelhead would be reduced to a level that is less-than-significant. If Mitigation Measure 7A.3-6(a) is implemented, and no work is conducted within 150 feet of top of bank of a creek, no further mitigation measures are required. In the event that implementation of Mitigation Measure 7A.3-6(a) is infeasible, then implementation of Mitigation Measures 7A.3-6(b) would reduce the significance of this impact under this alternative to a less-than-significant level.

> **Mitigation Measure 7A.3-6(a):** *Habitat avoidance*. Grading or ground-disturbing activities within 150 feet of the top of bank of a creek that supports steelhead shall be avoided.
>
> **Mitigation Measure 7A.3-6(b):** *Protective measures*. If the County Planning Office determines that avoidance of steelhead habitat is not feasible, Stanford shall obtain any required permits and approvals from federal and state wildlife agencies as well as a Streambed Alteration Agreement. Such permits and approvals shall specify the conditions under which construction activities may occur, including any applicable construction windows, installation of coffer dams or other measures necessary to protect steelhead.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7A.3-7: Additional Housing Alternative A activities could result in substantial loss or degradation of riparian habitat. (*Potentially Significant*)

Similar to the proposed Project, construction of infrastructure, habitat improvement and conservation projects under this alternative, including channel modifications and/or removal of man-made facilities and barriers to steelhead migration could occur within riparian habitat on the Project site outside of the Academic Growth Boundary. Stanford's activities in riparian areas are subject to the USFWS-approved Stanford HCP and the County-approved Special Conservation Area Plan which state that Stanford will protect habitat and use effective mitigation measures. Nevertheless, similar to the proposed Project, under this alternative, potential construction activity within riparian habitats on the Project site outside the Academic Growth Boundary could result in a significant impact to riparian habitat. Impacts under this alternative would be similar to proposed Project impacts.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would mitigate impacts to riparian habitat to less-than-significant levels. If Mitigation Measure 7A.3-7(a) is implemented, and no work is conducted within 150 feet of riparian habitat, no further mitigation measures are required. In the event that implementation of Mitigation Measure 7A.3-7(a) is infeasible, then implementation of Mitigation Measures 7A.3-7(b) would reduce the significance of this impact to a less-than-significant level.

> **Mitigation Measure 7A.3-7(a):** Grading or ground-disturbing activities within 150 feet of riparian habitat shall be avoided.
>
> **Mitigation Measure 7A.3-7(b):** If the County Planning Office determines that avoidance is not feasible, Stanford shall obtain all appropriate permits for wetland or other work within the riparian area from the Corps, USFWS, NMFS and CDFW. As specified by agency permits, any riparian habitat areas lost as a result of project development would be replaced through the creation, preservation or restoration of equivalent habitat at an appropriate mitigation ratio or through other measures that the agencies deem appropriate and approve in order to adequately mitigate the impact.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7A.3-8: Additional Housing Alternative A activities could result in the loss of native oak woodland habitat. (*Potentially Significant*)

In Santa Clara County, a decrease of 0.5-acre or more in the native oak canopy of an individual oak woodland is considered a significant impact. Similar to the proposed Project, under this alternative, potential removal of oaks within the oak woodland/savannah community as a result of development and/or infrastructure improvements in the Lathrop Development District, or necessary infrastructure improvements that may occur outside the Academic Growth Boundary, would have the potential to result in a significant direct impact to oak woodland. None of the additional housing proposed by this alternative would be located within the Lathrop Development District or outside the Academic Growth Boundary; consequently, this alternative would have similar impacts to oak woodlands in these areas as the proposed Project.

As with the proposed Project, operational activities associated with this alternative would not be expected to result in indirect impacts to oak woodland because operations are not likely to introduce non-native plant species that outcompete native oak trees, or introduce Sudden Oak Death into the oak woodlands. Consequently, similar to the proposed Project operational impacts on native oak woodland habitat under this alternative would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project and which are modeled on the Planning Office Guide to Evaluating Oak Woodlands Impacts, would reduce impacts to oak woodlands to a level that is less-than-significant.

Mitigation Measure 7A.3-8(a): Prior to oak tree removal within the Lathrop Development District, a tree removal plan and arborist report shall be submitted which identifies the species type, acreage, diameter, and amount of canopy of oak trees proposed for removal. The arborist report shall be prepared by an I.S.A. Certified Arborist, Registered Professional Forester, or another professional approved by the County Planning Office.

Mitigation Measure 7A.3-8(b): If the proposed oak tree removal would result in a decrease of 0.5-acre or more of native oak canopy on the project site, at least two of the following three mitigation measures shall be implemented:

1) *Planting Replacement of Oak Trees*. Pursuant to Public Resources Code Section 21083.4, the planting of oaks shall not fulfill more than 50 percent of the mitigation requirement for the project.

   Tree replacement can be dependent upon the size of the canopy of the removed trees, the number of trees to be removed, the size of trees to be removed, the type of trees to be removed, the steepness of the slope on which trees will be removed, or the amount of room on a parcel in which trees can be planted. The objective of tree planting shall be to restore former oak woodland at a ratio of 2:1 or 3:1 based on the condition of the oak woodland habitat. 2:1 restoration is recommended for medium quality oak woodland habitat, and 3:1 restoration is recommended for high quality oak woodland habitat.

   The following standard mitigation ratios shall be used, unless a different ratio is applied by the Planning Office based on site-specific characteristics:

   - For the removal of one small tree (5-18 inches): two 24-inch boxed trees or three 15 gallon trees.
   - For the removal of 1 medium tree (18-24 inches): three 24-inch boxed trees or four 15 gallon trees.
   - For the removal of a tree larger than 24 inches: four 24-inch boxed trees or five 15 gallon trees.

   All tree replacement shall be with in-kind species, unless alternate species are approved by the county. A Tree Planting and Maintenance Plan shall be submitted showing species, size, spacing and location of plantings and the location and species of established vegetation. Tree plantings shall be monitored for five years following planting and a survival rate of 75% will be required. Should the planted trees fail to meet the established performance and survival criteria, Stanford shall be responsible for additional plantings and management activities necessary to ensure the long-term success of planted mitigation trees.

2) *Conservation Easement.* Protect existing native oak trees on or off the project site from future development through a conservation easement or fee title dedication to the County or a land conservation group approved by the County.

   Oak woodland offered as mitigation must be configured in such a manner as to best preserve the integrity of the oak ecosystem and minimize the ratio of edge to area. Priority should be given to conserving oak habitat adjacent to existing woodlands

under conservation easements, public lands or open space lands. The protection of existing oak woodlands through conservation easements shall mitigate for the loss of oaks at a ratio equal to 2:1 (for medium quality oak woodland habitat) or 3:1 (for high quality oak woodland habitat) as determined by the County Planning Office. Land proposed as mitigation, when viewed with adjacent protected conservation land, should not result in conserved parcels of less than one acre.

3) *Other Options*. If the County Planning Office determines that there are no feasible sites for oak woodland mitigation on Stanford lands, then Stanford shall submit a plan for review and approval by the County Planning Office that provides for the conservation of oak woodlands elsewhere in Santa Clara County in the same manner as 7A.3-8(b)(2).

   This plan must include protection of an existing oak ecosystem through a conservation easement or fee title dedication to the County or other local agency or organization responsible for the oak woodlands preservation.

Significance after Mitigation: Less than Significant.

Impact 7A.3-9: Additional Housing Alternative A construction activities could result in substantial adverse effects on jurisdictional waters and wetlands. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, construction of new buildings and infrastructure, and on-going habitat enhancements/improvements and conservation projects under this alternative could necessitate filling or altering waters and wetlands through sediment delivery, discharge of contaminants, or interruption of hydrological flow. While, similar to the proposed Project, only a small quantity of jurisdictional waters or wetlands are located in areas upon which building development under this alternative could be constructed, infrastructure and habitat enhancement improvements could indirectly affect jurisdictional waters and wetlands in all locations in which such features are present. As under the proposed Project, construction activities under this alternative could result in significant impacts to jurisdictional waters and wetlands. Impacts under this alternative would be similar to proposed Project impacts. The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would mitigate impacts to jurisdictional waters and wetlands to less-than-significant levels.

Mitigation Measure 7A.3-9(a): *Jurisdictional waters and wetland identification.* Stanford has provided a wetland delineation that covers the lands within the Academic Growth Boundary. Prior to grading or ground-disturbing activities on lands outside the Academic Growth Boundary, the County shall determine whether the existing wetland delineation is adequate to assess the project's impacts and, if not, an independent, qualified wetland biologist approved by the County shall delineate jurisdictional waters or wetlands on and within 250 feet of the construction site.

Mitigation Measure 7A.3-9(b): *Jurisdictional waters and wetlands avoidance.* For all projects grading or ground-disturbing activities within 250 feet of jurisdictional waters or wetlands shall be avoided unless the County Planning Office determines that avoidance is not feasible.

Mitigation Measure 7A.3-9(c): *Jurisdictional waters or wetland replacement.* If the County Planning Office determines that avoidance of jurisdictional waters or wetlands is not feasible, Stanford shall obtain all appropriate permits or approval for work in jurisdictional waters (i.e., Waters of the State or Waters of the U.S.), from applicable agencies, including but not necessarily limited to, the U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, and California State Department of Fish and Wildlife. Any jurisdictional waters or wetlands that are filled as a result of project development shall be replaced through the creation, preservation or restoration of jurisdictional waters or wetlands or through other measures that the agencies deem appropriate through permit requirements to adequately mitigate the impact. Potential measures may include the following:

- For creek projects, remove hardscape features from the stream channel and stream banks.
- Stabilize exposed slopes or streambanks immediately upon completion of construction activities.
- To restore disturbed aquatic sites, a wetland mitigation and monitoring plan will be prepared that outlines the objectives to mitigate for construction impacts. At a minimum the plan will include thresholds of replanting success (e.g., 90 percent plant survival after one year, 80 percent second year, and 70 percent third year), monitoring requirements (e.g., at least once each year to confirm site stability, plant viability, and to schedule weeding, as needed), and shall specify resource agency reporting requirements.

Significance after Mitigation: Less than Significant.

Impact 7A.3-10: Implementation of Additional Housing Alternative A would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant*)

Similar to the proposed Project, while construction activities associated with infrastructure improvements and on-going habitat enhancement improvements under Additional Housing Alternative A could temporarily impede wildlife movement, such improvements would not result in substantial long-term interference. Implementation of the required USFWS-approved Stanford HCP and County-approved Special Conservation Area Plan measures would ensure that impacts to movement corridors and nursery sites for fish and wildlife on Project site lands outside the Academic Growth Boundary and CTS movement corridors within the oak woodland/savannah community within the Academic Growth Boundary would be less-than-significant. Impacts under this alternative would be similar to proposed Project impacts.

Mitigation: None required.

Impact 7A.3-11: Implementation of Additional Housing Alternative A could conflict with local Santa Clara County tree preservation ordinance. (*Potentially Significant*)

Similar to the proposed Project, construction of academic facilities, housing units and infrastructure improvements under Additional Housing Alternative A could result in the need to remove trees that are protected by the Santa Clara County tree preservation ordinance. Notwithstanding protections provided by the County tree preservation ordinance, construction activities under this alternative could result in significant impacts to protected trees, similar to the proposed Project. More trees may potentially be impacted under this alternative compared the proposed Project because there would be more construction and larger development footprint under this alternative. The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would ensure compliance with the County's tree preservation ordinance:

Mitigation Measure 7A.3-11(a): A "tree" is defined a woody plant having a single trunk measuring at least 37.7 inches in circumference (12 inches or more in diameter) or in the case of multi-trunk trees, a trunk size of 75.4 inches in circumference (24 inches in diameter). A protected tree on the Stanford campus is a:

- heritage tree (if included on the County's heritage resource inventory adopted by resolution of the Board of Supervisors);
- a tree planted or retained as required by conditions of approval of County permits;
- and a tree located within County rights-of-way and easements.

Stanford shall not remove a protected tree unless:

1. Removal of the protected tree is authorized by a County land use approval for which a grading or building permit has been issued.
2. Removal of the protected tree is authorized by a County-issued administrative permit or encroachment permit for tree removal; or
3. Removal of the protected tree is exempt. In addition to trees removed pursuant to a County land use approval, the ordinance currently exempts removal of a protected tree in the following circumstances:
    - the tree is diseased, dead, or dying or substantially damaged from natural causes;
    - tree cutting is needed to remove a hazard to life and personal property; and
    - maintenance work within public utility easements

Mitigation Measure 7A.3-11(b): Issuance of a land use permit, administrative permit or encroachment permit that authorizes removal of a protected tree shall be conditioned as follows:

1. Protected trees shall be replaced at a ratio of 3:1 for oaks and 1:1 for other protected trees; or

2. Stanford may submit a Vegetation Management Plan for the entire campus to the County Planning Office for review and approval. This plan must provide for the same or greater level of tree protection as the measures described in Mitigation Measure 7A.3-11(b)(1).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7A.3-12: Implementation of Additional Housing Alternative A could cumulatively cause an adverse impact to biological resources. (*Potentially Significant*)

Cumulative impacts analysis considers the effects of Project implementation in combination with those of proximate past, present, and reasonably foreseeable future projects, and whether the project's contribution to the cumulative impact would be significant. Stanford's lands outside the Academic Growth Boundary in unincorporated Santa Clara County are relatively isolated, covering a large area adjacent to other largely undeveloped lands, including Stanford's 1,200-acre Jasper Ridge Biological Preserve, which is maintained for research and education and closed to recreational use. On the Stanford HCP lands, which include most of the Project site as well as adjacent Stanford-owned land in the City of Palo Alto, creek restoration, invasive species removal and vegetation management activities are ongoing. These activities may cause minor disturbance to habitat areas, but the long-term impact would be beneficial to sensitive natural communities and to special status plants and wildlife.

Stanford is also considering a range of alternatives at the Searsville dam and reservoir that could provide fish passage, allow natural annual sediment load to flow downstream, create a replacement water diversion downstream, and relocate Searsville water storage functions to an expanded Felt Reservoir. Stanford acknowledges that such improvements would require comprehensive and coordinated collaboration with federal, State and local agencies, including the San Francisquito Creek Joint Powers Authority (SFCJPA), its local government members, and local community and residents in the watershed. No specific alternative has been selected or approved at this time.

In addition, the SFCJPA is currently undergoing environmental review of a range of alternatives to address flow capacity deficiencies in San Francisquito Creek to reduce flooding potential, and enhance ecosystems and recreation. Alternatives include potential channel and/or potential bypass improvements within the creek downstream of Stanford; and constructing one or more detention basin improvements, including on Stanford lands within the Project site (e.g., Lagunita, Felt Reservoir) and outside the Project site (e.g. Searsville Reservoir and within the Jasper Preserve). No specific alternative has been selected or approved at this time.

Otherwise, urbanized areas of adjacent jurisdictions, including within Palo Alto, are adjacent to largely developed areas of the Project site (i.e., those areas within the Academic Growth Boundary). As discussed in Chapter 5.0 of the Draft EIR, Stanford is currently in the midst of constructing the remaining housing and academic and academic support facilities authorized under the 2000 General Use Permit within the Academic Growth Boundary. While the timing of

construction has the potential to increase temporary impacts on biological resources from tree removal, noise disturbance, and other impacts, impacts would be limited to the immediate construction area within the Academic Growth Boundary, which has limited biological value. Additional non-Project cumulative development in adjacent jurisdictions would be expected to continue to occur over the duration of the 2018 General Use Permit and would be subject to applicable regulations and environmental review requirements of those jurisdictions.

Special Status Plants and Wildlife

As discussed above, activities under this alternative would result in potential impacts to special-status plants and wildlife. Similar to mitigation identified for the proposed Project, implementation of Mitigation Measures 7A3-1(a)-(e), 7A.3-2(a)-(d), 7A.3-3(a)-(c), 7A.3-4(a)-(b), and 7A.3-6(a)-(c) identified for this alternative would require plant and nesting bird, bat, and dusky-footed woodrat surveys and avoidance and minimization of potential impacts to special-status species and their habitat, including corridors; and reduction of any potentially impacts to special-status plants and wildlife to a less than significant level. Other cumulative development projects outside the Project site would also be required to comply with applicable federal and State regulations protecting special-status species through implementation of similar mitigation measures during construction by those jurisdictions. Activities associated with this alternative would cause a small amount of loss of undeveloped habitat in the area, principally within the Academic Growth Boundary. However, similar to the proposed Project, with the implementation of these measures, this alternative would not have a cumulatively considerable contribution to impacts on special status species.

Nesting Birds

As discussed above, activities under this alternative would result in potential impacts to nesting migratory birds, including special-status species. Similar to mitigation identified for the proposed Project, implementation of Mitigation Measure 7A.3-1(a)-(b) for this alternative would require preconstruction nesting bird surveys and avoidance of known nest sites, thereby minimizing this impact under this alternative to a less than significant level. Other cumulative projects for creek restoration, invasive species removal and vegetation management may also impact nesting birds, but would also be required to comply with applicable regulations protecting nesting birds, through implementation of similar mitigation measures during construction by those jurisdictions. Similar to the proposed Project, with the implementation of these measures, implementation of this alternative would not have a cumulatively considerable contribution to impacts on nesting birds.

Steelhead

The Project site contains a segment of San Francisquito Creek that provides habitat for steelhead. As discussed above, in addition to implementing the County Special Conservation Area Plan guidelines to minimize disturbance to steelhead, Stanford must obtain permits and approvals from applicable federal and state wildlife and water quality agencies to perform work in creeks that support steelhead; see Mitigation Measure 7A.3-6(a)-(c). These permits, including a Streambed Alteration Agreement, specify the conditions under which construction activities may occur, including construction windows, cofferdams or other measures necessary to protect steelhead. Other cumulative projects would also be required to comply with applicable federal and State regulations protecting steelhead and other fish, through implementation of similar mitigation measures during

construction by those jurisdictions. Similar to the proposed Project, with the implementation of these measures, this alternative would not have a cumulatively considerable contribution to impacts on steelhead.

Wetlands, Waters and Sensitive Riparian Communities

Construction under this alternative could result in impacts to riparian habitat or jurisdictional waters of the United States and waters of the State. As discussed above, Mitigation Measures 7A.3-7(a)-(b) and 7A.3-9(a)-(c) would minimize disturbance, and mitigate for necessary disturbance to sensitive riparian areas, wetlands and waters. As with special-status species, other cumulative projects would be required to comply with applicable federal and State regulations protecting riparian habitat and jurisdictional waters by those jurisdictions. Similar to the proposed Project, the potential impacts of this alternative in combination with other projects would not contribute to a cumulatively significant impact on riparian habitat, and jurisdictional waters of the United States and waters of the State, including drainages and seasonal wetlands.

Oak Woodlands

As discussed above, construction under this alternative could result in impacts to sensitive oak woodland habitat from ongoing and future development projects. Mitigation Measures 7A.3-8(a)-(b) and 5.3.11(a)-(c) would minimize disturbance and mitigate for necessary disturbance to oak woodlands, including protected trees. Other cumulative projects outside the Project site would also be required to comply with applicable federal and State regulations protecting oak woodlands of those jurisdictions. The potential impacts of this alternative in combination with other projects would not contribute to a cumulatively significant impact on oak woodland communities.

As discussed above, all biological impacts associated with construction and operation of Additional Housing Alternative A would be mitigated to a less than significant level. There are no biological impacts of this alternative that, when considered in combination with other cumulative development, would make a considerable contribution to cumulative effects.

> **Mitigation:** Implement Mitigation Measures 7A.3-1(a)-(b), 7A.3-2(a)-(d), 7A.3-3 (a)-(c), 7A.3-4(a)-(b), 7A.3-6(a)-(c), 7A.3-7(a)-(b), 7A.3-8(a)-(b), 7A.3-9(a)-(c), and 7A.3.11(a)-(c).
>
> **Significance after Mitigation:** Less than Significant.

Cultural and Paleontological Resources

Construction and Operational Impacts

Impact 7A.4-1: Additional Housing Alternative A development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. (*Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on redevelopment and infill

sites. As discussed in Section 5.4, the majority of historic resources within the Academic Growth Boundary are located in the Campus Center Development District. The additional housing proposed under this alternative would be located in the East Campus Development District, within which only two eligible collegiate buildings exist; the DAPER and Administrative Development District, within which the stadium embankment is the only identified eligible collegiate property, and the Quarry and West Campus Development Districts, within which no eligible collegiate buildings are identified. Consequently, this alternative would have an incrementally greater potential than the proposed Project to result in direct, physical impacts to historic resources and infill development that could alter the setting and surrounding environment of historic resources and result in indirect impacts; both of these effects could result in significant impacts.

Implementation of **Mitigation Measures 7A.4-1(a)-(e)** identified for this alternative, which are the same as those identified for the proposed Project, would provide a formal framework for conditions protecting historic resources. Similar to the proposed Project, while it is considered unlikely that Stanford would demolish any of its historic buildings and structures within the Project site or alter them in a manner that does not comply with the Secretary of Interior Standards under this alternative, if such actions were to occur, they would result in a significant and unavoidable impact to historic resources. Pursuant to the established regulatory framework, the County would review these projects and prepare the appropriate project-specific CEQA environmental review, and if a significant impact were to be identified additional feasible mitigation for these individual projects may be identified at that time to avoid or reduce the magnitude of the significant impact. The project-specific CEQA environmental review would include an evaluation of the feasibility of preserving the historic resource.

> **Mitigation Measure 7A.4-1(a):** The Stanford University Historic Resources Survey dated April 2017 contains an evaluation of all buildings and structures located within the Stanford Community Plan's Academic Campus land use designation that were constructed prior to 1976. Prior to 2025, Stanford shall provide to the County Planning Office for the review and approval of the County Planning Director (or designated representative) an additional survey of structures built within the Academic Campus land use designation between 1976 and 1985 ("Survey Addendum"). At its discretion, the County Planning Office may require a peer review of the Survey Addendum by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.
>
> **Mitigation Measure 7A.4-1(b):** For any building project that involves demolition of an historical resource that is listed or has been identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review of the project. Consistent with the County's process the analysis of project impacts, alternatives and mitigation will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to approval.
>
> **Mitigation Measure 7A.4-1(c):** For any proposed building project that involves remodeling, alteration, or a potential physical effect on an historical resource that is listed or identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, Stanford shall meet the following requirements:

1) The proposed building project shall be consistent with the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1995) ("Secretary of Interior's Standards"). Stanford shall submit documentation to the County prepared by a qualified professional to demonstrate consistency of the proposed project with the Secretary of the Interior's Standards. If the work to be performed constitutes basic maintenance, repair or replacement, Stanford shall mark the project plans with text stating: "Exterior work is limited to replacement of deteriorated materials with in-kind materials that match the old. Project plans have been reviewed by [Name of Architect], who has determined the work would comply with the Secretary of Interior's Standards." If the work to be performed is more extensive than basic maintenance, repair or replacement in kind, Stanford shall submit a letter along with the project plans explaining the basis for the University Architect's Office determination that the work would comply with the Secretary of Interior's Standards. The County Planning Office will review the marked plans or letter, and may require additional documentation.

2) The requirement that the building project must be consistent with the Secretary of the Interior's Standards shall be primarily limited to alterations to the exterior. Building interiors will be exempt from such a consistency requirement, except for interior spaces that are open to the general public on an ongoing basis. Such buildings are listed below along with their public interior spaces.

Historic Resource	Primary public space(s) subject to review (if integrity present)	Secondary space(s): no review required
Cantor Center/ Stanford Museum	Lobby and galleries on first and second floors of 1891 and 1902 wings	Restrooms, staff offices, collection storage areas, all basement areas and all spaces in 1999 addition
Memorial Church	Main sanctuary, entry vestibule, organ and choir lofts	Restrooms, offices and store rooms, all basement areas
Art Gallery	Vestibule and gallery space	Restrooms, offices and store rooms, all basement areas
Hoover Tower	Lobby, galleries, observation platform	Restrooms, offices and store rooms, all basement areas
Memorial Hall	Lobby, Pigott Theater, Auditorium	Restrooms, offices and store rooms, radio station
Frost Amphitheater	Terraces, stage	Restrooms, store rooms
Burnham Pavilion/ Ford Center	Lobby, main gym	Restrooms, locker rooms, offices, store rooms; all spaces in 1990 addition

3) The County Planning Office may require a peer review of the Secretary of the Interior's Standards consistency analysis by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.

4) If it is not feasible for the building project to be consistent with the Secretary of Interior's Standards, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review. The analysis of impacts, alternatives and mitigation measures will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to County approval.

Mitigation Measure 7A.4-1(d): For any building project that involves demolition, modification or significant alteration of a structure located outside of the Academic Campus land use designation that is 50 years old or more, Stanford may elect to follow the Secretary of Interior's Standards. If Stanford does not elect to follow the Secretary of Interior's Standards for such a project Stanford shall submit an assessment regarding its eligibility for listing on the California Register ("Eligibility Assessment") to the County Planning Office. If the County Planning Office determines that the building/structure is eligible for listing on the California Register, then Stanford shall comply with the provisions in Sections 2 and 3 above and the building/structure shall be treated as if it were identified as eligible for listing in the Stanford Historic Resources Survey or Addendum for purposes of those Sections. The County Planning Office may require a peer review of the Eligibility Assessment by a qualified professional (Architect or Architectural Historian) at Stanford's expense.

Mitigation Measure 7A.4-1(e): Proposed new buildings located within 75 feet of an historic resource that is identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey, Survey Addendum or Eligibility Assessment, measured from the nearest exterior walls, shall be reviewed by the University Architect to ensure that the design does not negatively impact the historic resources surrounding it. Stanford shall prepare design guidelines and submit a letter to the County Planning Office confirming that the new building construction has been reviewed by the University Architect's Office and is compatible with any historic resources located within 75 feet of the proposed new building. The County Planning Director (or designated representative) will review the letter prior to County approval of the new building. The County Planning Office may require a peer review of the University Architect's evaluation prior to approval of the building.

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.4-2: Additional Housing Alternative A development could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. Consequently, this alternative would require greater excavation of soils related to underground utilities, construction of building foundations, and in some cases, to accommodate underground levels, than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to archaeological resources compared to the proposed Project.

Similar to the proposed Project, while no individual projects and specific locations have been identified for development under this alternative, if construction were to occur within the boundaries of a recorded prehistoric archaeological site, a project-specific analysis would be required to determine whether the site constituted a unique archaeological resource according to

PRC Section 21083.2 or a historical resource according to PRC Section 21084.1, and if so, whether the site would be adversely affected, thus resulting in a significant impact. Also, similar to the proposed Project, it is possible that previously unknown prehistoric archaeological sites could be unearthed during excavation or earthmoving activities for an individual project under the alternative. As under the proposed Project, this could result in a significant impact to a unique archaeological resource or a historical resource under this alternative.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant archaeological resources within the Project site. Individual projects under this alternative that would require a County building permit or other County approval would be subject to conditions of approval that include specific requirements addressing archaeological resources within the Project site. Implementation of **Mitigation Measure 7A.4-2(a)-(b)** identified for this alternative, which is the same as that identified for the proposed Project, would provide a formal framework for conditions providing protection of archaeological resources under this alternative. Similarly, implementation of this mitigation measure for this alternative would ensure that potential impacts to prehistoric and historic-period archaeological resources on the Project site would be reduced to a less-than-significant level.

> **Mitigation Measure 7A.4-2(a):** Stanford has provided a map to the County Planning Office, maintained as a confidential record, that shows the location of all known prehistoric and historic archaeological resources in the unincorporated Santa Clara County portion of Stanford lands. Stanford shall conduct a Record Search at the Northwest Information Center of the California Historical Resources Information System and submit an updated map each year as part of the 2018 General Use Permit annual monitoring and compliance process. This annual update will be the basis for evaluating potential impacts of future projects that include ground disturbance.
>
> At the discretion of the County Planning Office, project-related archaeological site assessments and monitoring shall be conducted and mitigation measures identified by either the Stanford University Archaeologist or an independent archaeologist retained by the County at Stanford's expense. All archaeological reports (including, but not limited to, site assessments, monitoring reports, Archaeological Treatment Plans) shall be forwarded to the County Planning Office for review at Stanford's expense. All work shall be performed by, or under the supervision of, an archaeologist that meets the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).
>
> Significant impacts from projects on prehistoric and historic archaeological resources shall be addressed as specified below:
>
> 1. If a building project is proposed to be situated on a mapped archaeological site, a qualified archaeologist shall conduct further project-specific analysis to determine whether a significant impact would occur. If the site is determined to be eligible and cannot be avoided, an Archaeological Resources Treatment Plan shall be prepared and approved by the County Planning Office prior to the commencement of ground disturbing activities. If a Stanford archaeologist performs this work, the County may at its discretion require a peer review by an independent qualified archaeologist at Stanford's expense. Project-specific mitigation, if necessary, shall be identified in accordance with the provisions of Section 21083.2 of the Public Resources Code.

2. In the event that previously unidentified historic or prehistoric archaeological resources are discovered during construction, the contractor shall cease work in the immediate area and the County Planning Office and University Archaeologist shall be contacted immediately. The University Archaeologist shall provide and implement a proposed Archaeological Resources Treatment Plan. At the discretion of the County Planning Director (or designated representative) an independent qualified archaeologist may be retained by the County at the expense of Stanford to assess the significance of the find and the adequacy of the proposed Archaeological Resources Treatment Plan.

3. Archaeological monitoring shall be conducted at any time construction-related ground-disturbing activities (greater than 12 inches in depth) are taking place within 100 feet of known archaeological resources. A technical report including the results of all monitoring activities shall be prepared once monitoring is completed in accordance with professional standards and submitted to the University Archaeologist. The archaeological monitoring shall be conducted or supervised by an individual meeting the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).

Mitigation Measure 7A.4-2(b): In the event that human skeletal remains are encountered, Stanford is required by County Ordinance No. B6-18 to immediately notify the County Coroner. Work shall immediately stop within a 100-foot radius of the find. If the County Coroner determines that the remains are Native American, the coroner shall contact the California Native American Heritage Commission, pursuant to Health and Safety Code Section 7050.5(c), and the County Coordinator of Indian affairs. No further disturbance of the site may be made except as authorized by the County Coroner. If artifacts are found in association with the human skeletal remains no further disturbance of the artifacts may be made until authorized by the County Planning Office. It is the responsibility of Stanford to provide for reburial of the human skeletal remains and associated artifacts following completion of the required Native American consultation process described Health and Safety Code section 7050.5 (c); Stanford will file a State Record Form (DPR Series) documenting the reburial location with the California Historical Resources Information System and provide the location on the updated map provided for in Section 3 above.

Significance after Mitigation: Less than Significant.

Impact 7A.4-3: Additional Housing Alternative A development could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to paleontological resources during construction compared to the proposed Project.

Similar to the proposed Project, if excavation related to construction of development on the Project site under this alternative would uncover additional paleontological resources, this impact would be considered significant.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant paleontological resources within the Project site. Individual projects under this alternative that would require a County building permit or other County approval would be subject to conditions of approval that include specific requirements addressing paleontological resources within the Project site. Implementation of **Mitigation Measure 7A.4-3** identified for this alternative, which are the same as those identified for the proposed Project, provides a formal framework for conditions providing protection of paleontological resources. Implementation of this mitigation measure would ensure that potential impacts to prehistoric and historic-period paleontological resources on the Project site for this alternative would be reduced to a less-than-significant level.

> **Mitigation Measure 7A.4-3:** In the event that potentially significant fossilized shell or bone is uncovered during any earth-disturbing operation, contractors shall stop work within 100 feet of the find and notify the University Archaeologist and the County Building Inspector assigned to the project. The University Archaeologist shall visit the site and make recommendations for treatment of the find (including but not limited to consultation with a paleontologist and excavation, if warranted), which shall be sent to the County Building Inspection Office and the County Planning Office. If a fossil find is confirmed, it will be recorded with the United States Geological Survey and curated in an appropriate repository.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7A.4-4: Additional Housing Alternative A development could disturb human remains, including those interred outside of dedicated cemeteries. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to undiscovered human remains during construction compared to the proposed Project.

Although unlikely, there is the possibility that human remains, including those interred outside of dedicated cemeteries, could be encountered during ground-disturbing activities associated with new development under this alternative. As with the proposed Project, this impact would be considered significant for this alternative.

In the event that human skeletal remains are discovered during construction, implementation of **Mitigation Measure 7A.4-2(b)** identified for this alternative, which is the same as that identified

for the proposed Project, as described under Impact 7A.4-2, requires the contractor to cease work within 100 feet and notify the County coroner. If the coroner determines that the bones are Native American, the coroner shall contact the California Native American Heritage Commission. Implementation of this mitigation measure for this alternative would ensure potential impacts to human remains would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure 7A.4-2(b).

Significance after Mitigation: Less than Significant.

Impact 7A.4-5: Additional Housing Alternative A development could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. (*Potentially Significant*)

Based on the results of the NAHC Sacred Lands File search, there are no documented tribal cultural resources on the Project site. However, there are numerous prehistoric archaeological sites on the Project site, many of which may be considered tribal cultural resources. Similar to the proposed Project, potential impacts to archaeological sites that are considered tribal cultural resources as a result of development under this alternative would be considered significant.

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative would have a greater potential to result in impacts to tribal cultural resources during construction compared to the proposed Project.

As discussed in Impact 7A.4-2 above, **Mitigation Measure 7A.4-2(a)** identified for this alternative requires that if a project is proposed within 100 feet of the location of a recorded archaeological site, at the discretion of the County Planning Office, further site-specific analysis shall be conducted to determine whether a significant impact would occur and to identify appropriate mitigation. The mitigation measure also requires archaeological monitoring for ground-disturbing activities (greater than 12 inches in depth) would take place in the immediate vicinity of known archaeological resources. Additionally, in the event that a previously unidentified prehistoric archaeological resource is discovered during construction, Mitigation Measure 7A.4-2(b) requires the contractor to cease work within 100 feet and contact the County Planning Office and University Archaeologist, and in the event that human skeletal remains are encountered, notify the County Coroner. Similar to mitigation identified for the proposed Project, implementation of Mitigation Measure 7A.4-2 for this alternative would ensure potential impacts to tribal cultural resources would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure7A.4-2(a)-(b).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7A.4-6: Additional Housing Alternative A development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources. (*Potentially Significant*)

The geographic scope for cumulative effects on historical resources includes unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and towns of Portola Valley and Woodside. Similar to the proposed Project, the potential impacts under this alternative when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on historic resources. A cumulatively considerable (significant) effect would occur if this alternative affected the same type of resource as one or more cumulative projects.

Similar to mitigation identified for the proposed Project, compliance with Mitigation Measure 7A.4-1(a)-(e) for this alternative would require a protocol for the identification and protection of historic buildings and structures within the Project site and would generally reduce impacts to these types of resources as a category to the extent feasible. Similarly, cumulative projects located outside of the Project site that involve historic resources, would be subject to applicable regulations and environmental review requirements of those jurisdictions. While these regulations, processes, and conditions reduce impacts to historic resources both on the Stanford lands and in Santa Clara County as a whole, demolition of historic resources would not be prohibited; therefore, the cumulative impact for this alternative, similar to the proposed Project, would be significant and unavoidable.

Mitigation: Implement Mitigation Measure 7A.4-1(a)-(e).

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.4-7: Ground-disturbing activities undertaken as part of the Additional Housing Alternative A could cumulatively cause a substantial adverse change in the significance of an archaeological resource, paleontological resource, or tribal cultural resource, or disturb human remains during construction. (*Potentially Significant*)

The geographic scope for cumulative effects on cultural and paleontological resources includes the unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and the towns of Portola Valley and Woodside. The cumulative analysis combines archaeological resources, paleontological resources, tribal cultural resources, and human remains into a single, non-renewable resource base and considers the additive effect of potential project impacts to significant regional impacts

on cultural resources. Similar to the proposed Project, the potential impacts under this alternative when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on cultural resources. A cumulatively considerable effect would occur if the Project affected the same type of resource as one or more cumulative projects. Impacts to archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries would be mitigated to a less-than-significant level with compliance with **Mitigation Measure 7A.4-2(a)-(b)** and **Mitigation Measure 7A.4-3**, which would require implementation of protocol to follow in the event of a discovery and the appropriate treatment of human remains as well as site-specific studies and monitoring in locations of previously recorded sites. Similarly, cumulative projects located outside of the Project site that involve archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries, would be subject to applicable regulations and environmental review requirements of those jurisdictions. Therefore, similar to the proposed Project with implementation of Mitigation Measure 7A.4-2 and Mitigation Measure 7A.4-3, this alternative's contribution to cumulative impacts would not be considerable, and the impact would be less than significant.

Mitigation: Implement Mitigation Measure 7A.4-2(a)-(b) and Mitigation Measure 7A.4-3.

Significance after Mitigation: Less than Significant.

Energy Conservation[23]

Construction and Operational Impacts

Impact 7A.5-1: Additional Housing Alternative A development would not result in the use of fuel, water, or energy in wasteful or inefficient manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Additional Housing Alternative A would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in energy use compared to the proposed Project.

Similar to the proposed Project, each of the six potential impact areas identified for Appendix F of the CEQA Guidelines are assessed for Additional Housing Alternative A with respect to energy use.

[23] The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives energy analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-ENE included in this document.

Appendix F.1: Energy Requirements and Energy Use Efficiencies of Additional Housing Alternative A

Similar to the proposed Project, energy consumption under Additional Housing Alternative A would be associated with electricity and natural gas use for operations, fuel consumption for mobile sources and emergency generator use, as well as energy consumption for construction activities. **Table 7A.5-1** presents the total energy demand in 2035 that would occur in the study area with implementation of Additional Housing Alternative A, and the net change in energy demand as compared to the 2018 environmental baseline.

TABLE 7A.5-1
NET CHANGE IN ENERGY CONSUMPTION UNDER PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE A

Energy Sector	Energy Demand in 2018 Baseline (MMBtu)	Total Energy Demand in 2035 with Proposed Project	Net Change in Energy Demand in Proposed Project compared to 2018 Baseline (MMBtu)	Total Energy Demand in 2035 with Buildout of Additional Housing Alternative A (MMBtu)	Net Change in Energy Demand Additional Housing Alternative A compared to 2018 Baseline (MMBtu)
Electricity	1,095,088	1,355,768	+260,680	1,386,598	+291,510
Natural Gas	577,799	718,441	+140,641	747,236	+169,437
Mobile Gasoline Consumption	673,769	528,237	-145,531	623,969	-49,800
Mobile Diesel Consumption	63,490	22,687	-40,803	28,437	-35,053
Stationary Fuel Consumption	5,042	6,157	+1,115	6,157	+1,115
Construction Activities	5,240	5,240	0	8,901	+ 3,661
Total	**2,420,428**	**2,636,532**	**+216,104**	**2,801,297**	**+380,869**

NOTES:

MMBtu = million British Thermal Units

SOURCE: Ramboll, 2018 (see Appendix ALT-ENE)

As can be seen from Table 7A.5-1, due to additional development and growth under Additional Housing Alternative A, demand for electricity and natural gas under this alternative would increase as compared to the 2018 baseline. Table 7A.5-1 also shows that demand for gasoline and diesel would decrease under Additional Housing Alternative A as compared to the 2018 baseline. Similar to the proposed Project, this is due to implementation of Stanford's alternative transportation programs, TDM program, and electric vehicle initiatives that would occur under this alternative; as well as from reasonable assumptions about increasing fuel efficiency of vehicles based on established State and federal regulatory standards.

Overall energy demand in 2035 with buildout of Additional Housing Alternative A is projected to increase approximately 16 percent over the 2018 baseline, although fuel consumption would be reduced as a result of the electrification of bus fleets. Energy demand in 2035 with buildout of Additional Housing Alternative A would also be approximately 6 percent greater than Project

conditions in 2035 due to the additional energy and fuel demand generated by the additional on-campus residential units.

However, as shown in **Table 7A.5-2**, the per capita energy demand under Additional Housing Alternative A would decrease, indicative of an overall improvement in energy efficiency compared to baseline conditions. Additional Housing Alternative A would also have a slightly lower per capita energy demand (37.3 MMBtu/service population) than the per capita energy demand of the proposed Project (38.3 MMBtu/service population) that results from the additional population serviced occupying the additional on-campus residential units. Similar to the proposed Project, the decrease in per capita energy demand under Additional Housing Alternative A compared to 2018 baseline conditions demonstrates that energy use efficiencies would increase under Additional Housing Alternative A, and resulting energy use from implementation would not be wasteful or inefficient.

TABLE 7A.5-2
NET CHANGE IN PER CAPITA ENERGY CONSUMPTION UNDER PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE A

Inventory Year	MMBtu Equivalents	Service Population	MMBtu/ Service Population
2018 Baseline	2,420,428	53,268	45.4
2035 with Buildout of Proposed Project	2,636,532	68,781	38.3
2035 with Buildout of Additional Housing Alternative A	2,801,297	75,078	37.3

NOTES:
MMBtu = million British Thermal Units

SOURCE: Ramboll, 2018 (see Appendix ALT-ENE)

Appendix F.2: The Effects of Additional Housing Alternative A on Local and Regional Energy Supplies and on Requirements for Additional Capacity

Similar to the proposed Project, use of the local and regional energy supply under Additional Housing Alternative A would be efficient as a result of use of renewable energy, energy efficiency standards, and the continued operation of the Stanford's CEF and implementation of the SESI program. Additionally, as under the proposed Project, while Stanford's proposed electrification of all Marguerite buses and 70 percent of its LBRE and Bonair vehicle fleets by 2035 would result in a small increase in calculated total electricity usage, the incremental electricity increase under this alternative would be more than offset by the associated decrease in diesel fuel consumption as shown in Table 7A.5-1. In addition, continued operation of the Stanford Solar Generating Station in Kern County and on-campus rooftop solar panels would provide campus electricity by renewable sources.

Over 98 percent of Stanford's electrical demand that is not met by the Solar Generating Station and on-campus rooftop solar panels is provided by a direct access provider which Stanford would, similar to the proposed Project, have the discretion to change throughout implementation of Additional Housing Alternative A. Electrical service providers including PG&E actively plan

for anticipated increases in peak demand and actively plan to offset growth in peak demands by encouraging and deploying energy efficiency and conservation measures within their service area. Given that there are approximately 6,000 megawatts of pending power plant projects is the state, similar to the proposed Project, Additional Housing Alternative A's increase in electrical demand would not have a substantial impact on the local or regional electrical supplies or require additional capacity to be constructed.

As shown in Table 7A.5-1, under Additional Housing Alternative A, the annual natural gas consumption in the study area in 2035 is estimated to increase by approximately 169,437 MMBtu over the 2018 baseline (and an increase of 28,795 MMBtu over the proposed Project). However, it is projected that natural gas demand in California will decrease in 2030 to 2.23 trillion Btu/yr. Ninety percent of the State's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins. The United States produces 20 trillion cubic feet per year and had 340 trillion cubic feet of proven reserves in 2014. Similar to the proposed Project, Stanford's natural gas consumption under Additional Housing Alternative A would not be substantial in comparison to the national natural gas reserves and would comprises only 0.003 percent of annual national natural gas production. Consequently, given the ample regional natural gas supplies available, Additional Housing Alternative A, similar to the proposed Project, would not have a significant impact on local or regional natural gas supply or require additional capacity to be constructed.

Gasoline and diesel are provided by California's transportation fuel supplier network. As shown in Table 7A.2-1, implementation of Additional Housing Alternative A would result in a reduction of gasoline and diesel demand compared to the 2018 baseline. The total net reduction in fuel use under Additional Housing Alternative A (-84,853 MMBtu) would be less than that under the proposed Project (-186,334MMBtu), however, due largely to a greater mobile gasoline use under this alternative. Regardless, similar to the proposed Project, Additional Housing Alternative A would not adversely affect local or regional supply of these fuels. As under the proposed Project, overall, Additional Housing Alternative A would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Appendix F.3: The Effects of Additional Housing Alternative A on Peak and Base Period Demands for Electricity and Other Forms of Energy

Stanford's SESI program was designed to increase its energy efficiency and allow the CEF to meet both peak and base demand for heating and cooling. Specific features of the new CEF allow for renewable or sustainable options for meeting peak demand. Stanford's procurement of substantial amounts of renewable energy, including the new 73 MW off-site Kern County solar plant and the 4.9 MW of on-site rooftop solar panels, would help meet peak electricity demands on campus. Specifically, the off-site solar plant would meet Stanford's peak electricity demand of 42 MW. This generation of new renewable energy would reduce the strain on electricity production by reducing the demand for the grid resources, particularly during peak times when energy demand is the highest. Although Additional Housing Alternative A would increase electricity demand compared to the proposed Project, based on the availability of these resources, as with the proposed Project, Additional Housing Alternative A effects on peak and base period demands for electricity would not result in wasteful or inefficient use of energy, or require additional capacity to be constructed.

Appendix F.4: The Degree to which Additional Housing Alternative A Complies with Existing Energy Standards

As under the proposed Project, during implementation of Additional Housing Alternative A, Stanford would be required to adhere to applicable federal and State standards designed to minimize use of fuel in construction vehicles and ensure that buildings employ required energy efficiency techniques.

Stanford new building construction is subject to California's Title 24, which reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6). Provisions added over the years include consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, and lighting, as well as construction waste diversion goals. Additionally, some standards focus on larger energy saving concepts such as reducing loads at peak periods and seasons, improving the quality of energy-saving installations, and performing energy system inspections. Development projects under the 2000 General Use Permit have often exceeded Title 24 requirements in construction and operation of new buildings.

With respect to transportation energy, existing energy standards are promulgated either through the regulation of fuel refineries and products, such as the low carbon fuel standard, or through light-duty vehicle greenhouse gas emissions standards and corporate average fuel economy standards established by USEPA. Further, construction projects at Stanford would comply with State requirements designed to minimize idling and associated emissions, which also minimizes use of fuel.

Appendix F.5: The Effects of Additional Housing Alternative A on Energy Resources

See the discussion above under Appendix F.2: The Effects of the Project on Local and Regional Energy Supplies and on Requirements for Additional Capacity.

Appendix F.6: The Projected Transportation Energy Use Requirements and Overall Use of Efficient Transportation Alternatives under Additional Housing Alternative A

As described further in the analysis of VMT presented in Transportation and Traffic, the per resident and per worker VMT generation under Additional Housing Alternative A, although higher than the proposed Project, would be substantially lower than the regional and countywide averages. The VMT rates would be supported by Stanford's TDM program and the ability for residents to commute to work or class without using personal vehicles due to the density of public transit near and on the campus. In addition, on-campus housing for faculty and students would lower commuting VMT. Lower VMT results in lower mobile fuel use per worker and per resident than the regionwide and countywide average.

Stanford's existing alternative transportation programs have resulted in the percentage of sustainable commuters (commuters traveling in modes other than single occupancy vehicles) at Stanford to increase from 31 percent in 2002 to 51 percent in 2016. The use of transit passes, bicycling, rideshares, and other alternative modes of transportation, demonstrate the efficient use of transportation systems at Stanford.

Although Additional Housing Alternative A's total VMT and consumption of mobile fuels is higher than the proposed Project's, Stanford's TDM measures and commute options that are currently in-place, including, but not limited to, Marguerite shuttle system, use of transit subsidies, Stanford's Commute Club and use of electric vehicles represent efficient transportation alternatives that would be utilized under Additional Housing Alternative A, similar to the proposed Project.

Conclusion

Overall energy demand in 2035 with buildout of Additional Housing Alternative A is projected to increase approximately 16 percent over the 2018 baseline (and approximately 6 percent greater than Project conditions in 2035). Electricity and natural gas demands would be higher than the proposed Project's, while the decrease in mobile fuels demand would be lesser than under the proposed Project. As shown in Table 7A.5-2, similar to the proposed Project, the per capita energy demand under Additional Housing Alternative A would decrease, indicative of an overall improvement in energy efficiency compared to baseline conditions. As under the proposed Project, the decrease in per capita energy demand under Additional Housing Alternative A demonstrates that energy use efficiencies would increase under this alternative, and resulting energy use from implementation of the alternative would not be wasteful or inefficient. Further, similar to the proposed Project, Additional Housing Alternative A would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Similar to the proposed Project, based on an evaluation of issues identified in CEQA Appendix F, Additional Housing Alternative A would not result in wasteful or inefficient consumption of fuel or energy, and would not create demand on local and regional energy supplies that would require additional energy generation or transmission capacity. This impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7A.5-2: Additional Housing Alternative A development, in conjunction with other cumulative development and growth, would not contribute to cumulative increases in demand for energy which would result in the use of large amounts of fuel, water, or energy, or use these in wasteful manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Electricity

Stanford is procuring the vast majority of electricity from Calpine through the direct access program. Calpine is one of many direct access electricity providers in the state and Stanford has the discretion to change providers over the implementation of the 2018 General Use Permit or Additional Housing Alternative A.

Continued growth throughout California's service areas could contribute to ongoing increases in demand for electricity. These anticipated increases would be countered, in part, by ongoing

increases in national, statewide, and local requirements and incentives to support construction or retrofit of buildings with increased energy efficiency. Overall state-wide electricity supply during most conditions is adequate to meet demand. However, as demand continues to increase, temporary shortfalls could occur on portions of the statewide grid during temporary periods of high peak demand. Electricity providers such as Calpine and PG&E are actively planning for anticipated increases in peak demand through 2050. Given that California ranked first in electricity production from both solar and geothermal energy, and that there are approximately 6,000 megawatts of pending power plant projects is the state, similar to the proposed Project, development under Additional Housing Alternative A would not constitute a cumulatively considerable impact on the primary regional electricity distributors or sources.

Natural Gas

With respect to natural gas, PG&E sources natural gas from a combination of producers and suppliers located in Canada and the U.S. Southwest. The utility maintains contracts with producers and suppliers over daily, monthly, and longer term agreements. PG&E also maintains gas storage facilities and a network of conveyance and distribution pipelines within its service area. In order to address future increases in demand, PG&E maintains an active planning process to identify and deploy additional conservation measures to minimize increases in demand, to secure continued natural gas supply, and to maintain sufficient distribution system capacity within its service area. The latest California Gas Report indicates that predicted demand for Northern California during a high demand wintertime scenario in 2035 of 2,463 MMCF per day will be 79 percent of available capacity. Similar to the proposed Project, existing and planned infrastructure is anticipated to be sufficient to maintain service to Additional Housing Alternative A and other cumulative scenario projects. Therefore, cumulative scenario impact on natural gas supply would not be cumulatively considerable.

Transportation Fuel

The cumulative context of transportation fuels involves both construction activities, which is predominantly a demand for diesel fuel; as well as operational demand, which is predominantly a demand for gasoline. Base gasoline demand dropped by about 13 percent between 2003 and 2013 and base diesel fuel demand remain unchanged between 2003 and 2013. Future statewide increases in gasoline demand associated with growth will likely continue to be offset by improvements to the vehicle fleet and programs such as low carbon fuel standard. As shown in Table 7A.5-1, implementation of Additional Housing Alternative A would, similar to the proposed Project, result in a net decrease in gasoline and diesel demand. Consequently, as under the proposed Project, Additional Housing Alternative A would not have a cumulatively considerable contribution to the demand for transportation fuels.

Mitigation: None required.

Geology and Soils

Construction Impacts

Impact 7A.6-1: Additional Housing Alternative A construction would not result in substantial soil erosion or loss of topsoil. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in correspondingly greater disturbance of soils formerly protected with vegetation or covered by asphalt or concrete that could be exposed to winds and water flows that result in soil erosion or the loss of topsoil.

As under the Project, individual projects developed under this alternative would be required to implement construction best management practices (BMPs), as detailed in the Storm Water Pollution Prevention Plan (SWPPP) as required by the Construction General Permit from the National Pollution Discharge Elimination System (NPDES) program, which provide a benefit of preventing soil erosion and loss of topsoil at construction sites. Thus, with adherence to the required BMPs, potential construction-related erosion effects would be minimized.

As under the Project, following completion of construction activities for individual projects under this alternative, disturbed areas would be either revegetated through landscaping or covered by impervious surfaces such as structures or asphalt which limits the potential for erosion. Thus, construction activities that would occur under the alternative would result in less-than-significant soil erosion impacts.

Mitigation: None required.

Operational Impacts

Impact 7A.6-2: Additional Housing Alternative A development would not expose people or structures to substantial adverse effects from ground shaking. (*Less than Significant*)

Additional Housing Alternative A would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more people and structures on the campus to potential effects of earthquake groundshaking. As with the proposed Project, as part of the County's approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all requirements of the California Building Code (CBC), the County Geologist, the County Building Inspection Office, the Stock Farm Monocline Agreement, and any other agreements defined during the term of the use permit under this alternative with regard to reduction of seismic risk. Similar to the proposed Project, site-specific geotechnical investigations for each project developed under this alternative, as required by the CBC, County and Stanford would be prepared for, and reviewed and approved by, the County Planning and

Development Department prior to issuance of a building permit, ensuring that seismic design requirements are incorporated into construction specifications. As under the proposed Project, compliance with the building safety design standards of the CBC, the County and Stanford would reduce potential impacts associated with ground shaking in projects developed under this alternative to a less-than-significant level.

Mitigation: None required.

Impact 7A.6-3: Additional Housing Alternative A development would not expose people or structures to potential substantial adverse effects associated with liquefaction or lateral spreading, including the risk of loss, injury or death, in the event of a major earthquake on one of the regional active faults. (*Less than Significant)*

Additional Housing Alternative A would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more residential population and structures on the campus to potential effects of liquefaction or lateral spreading in the event of a major earthquake. Under this alternative, additional housing would be developed in certain development districts - West Campus, DAPER and Administrative and Quarry Development Districts – that contain areas identified as being moderately susceptible to liquefaction; the East Campus Development District is identified as having a low susceptibility to liquefaction. Similar to the proposed Project, adherence to building code requirements using geotechnical design measures outlined in the final design level geotechnical report prepared for individual projects under this alternative, and approved by the County, would minimize the potential for effects related to liquefaction and lateral spreading. As with the proposed Project, implementation of these building code requirements and geotechnical measures for individual projects developed under this alternative would ensure that seismically-induced ground failure, including liquefaction and lateral spreading, would be a less than significant impact.

Mitigation: None required.

Impact 7A.6-4: Additional Housing Alternative A development would not expose people or structures to potential substantial adverse effects associated with landslides, including the risk of loss, injury or death, in the event of a major earthquake on one of the other regional active faults. (*Less than Significant*)

Additional Housing Alternative A would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more residential population and structures on the campus to potential effects of landslides in the event of a major earthquake. However, additional on-campus housing that would be developed under this alternative would not be located in areas of the Project site identified by CGS as being highly susceptible to seismically induced landslides; or susceptible to slope instability. In any case, similar to the proposed Project, compliance of individual projects

under this alternative with applicable building safety design standards would reduce potential impacts associated with seismically induced landslides to a less-than-significant level.

Mitigation: None required.

Impact 7A.6-5: Additional Housing Alternative A development would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in correspondingly greater disturbance of soils and/or the loss of topsoil than the proposed Project. As discussed in Impact 7A.6-1, above, similar to the proposed Project, with implementation of construction BMPs included in the SWPPP as required by the Construction General Permit from the NPDES program, potential construction-related erosion effects associated with new development under this alternative would be minimized. As with the proposed Project, following construction, each project that would be developed under this alternative would be required to implement post-construction BMPs that include erosion control measures. Thus, as with the proposed Project, operation of the new development under this alternative would not result in substantial soil erosion or the loss of topsoil, and impacts would be less than significant.

Mitigation: None required.

Impact 7A.6-6: Additional Housing Alternative A development would not result in substantial adverse effects from on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse as a result of being located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project development. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than would occur under the proposed 2018 General Use Permit. As a result, this alternative would have a greater potential than the proposed Project to be subject to effects from new development being located on an unstable geologic units or soils. As discussed in Impact 7A.6-3, above, certain development districts the proposed additional housing would be developed in - West Campus, DAPER and Administrative and Quarry Development Districts – contain areas identified as being moderately susceptible to liquefaction. However, as discussed in Impact 7A.6-4 above, none of the development districts in which additional on-campus housing would be developed are identified by CGS as being highly susceptible to seismically induced landslides; or susceptible to slope instability. As with the proposed Project, under this alternative, the potential for unstable soils to be present at the Project site would depend on site specific conditions and the scope of proposed improvements which would be evaluated as part of the required geotechnical investigations for individual projects. Site preparation measures would be

recommended in a geotechnical report and incorporated into site design in accordance with building code requirements, and approved by the County. Therefore, similar to the proposed Project, with adherence to building code requirements, the potential for unstable soils to adversely affect new development under this alternative would be reduced to a less-than-significant level.

Mitigation: None required.

Impact 7A.6-7: Development under the Additional Housing Alternative A would not be located on expansive soils that would create substantial risks to life or property. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than would occur under the proposed 2018 General Use Permit. As a result, this alternative would have a greater potential than the proposed Project to for new development to be located on expansive soils. As under the proposed Project, as a requirement of the CBC, any development under this alternative would be required to complete a final geotechnical investigation that includes site-specific recommendations for the mitigation of potentially expansive soils. As under the proposed Project, geotechnical investigation and analysis of underlying soils would inform the recommended structural design of individual building projects under this alternative. Therefore, similar to the proposed Project, implementation of standard geotechnical engineering practices and adherence to building code requirements under this alternative would identify and reduce potential impacts from expansive soils on new development to a less-than-significant level.

Mitigation: None required.

Cumulative Impacts

Impact 7A.6-8: Development facilitated by the Additional Housing Alternative A, combined with past, present, and reasonably foreseeable probable projects, would not result in substantial adverse cumulative impacts to geology, soils, or seismic hazards. (*Less than Significant*)

The geographic scope of potential geology and soils impacts is restricted to the Project site and immediate vicinity because related risks are relatively localized or even site-specific. Accordingly, potential seismic related hazards, including groundshaking and earthquake-induced liquefaction and landslides, would not be considered cumulative in nature. Similarly, other potential geologic hazards such as unstable soils, expansive soils, and slope stability would also be localized or site-specific, and as a result, would not be cumulative in nature.

As under the proposed 2018 General Use Permit, for individual projects under Additional Housing Alternative A, construction activities at the Project site, similar to other cumulative

development greater than one acre in size, would be required to comply with the NPDES Construction General Permit, which contain erosion control requirements that would minimize the potential for erosion. The NPDES program requires the preparation and implementation of SWPPPs for construction activities that include BMPs that ensure erosion control measures are included during construction. The individual projects under this alternative would be required to comply with these regulations, as would other cumulative development. Similarly, individual projects under this alternative would be required to implement post-construction BMPs that include erosion control measures, as would other cumulative development. Therefore, similar to the proposed Project, this alternative, in conjunction with other nearby cumulative development would not have a cumulatively significant impact associated with erosion.

Mitigation: None required.

Greenhouse Gas Emissions[24]

Impact 7A.7-1: Additional Housing Alternative A would not generate greenhouse gas emissions, either directly or indirectly, that would have a cumulatively considerable contribution to global climate change. (*Less than Significant*)

Additional Housing Alternative A would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in greenhouse gas emissions compared to the proposed Project.

Similar to the GHG Impact analysis conducted for the proposed Project, an evaluation was conducted of the emissions inventory for the complete buildout of the development allowed in the study area under Additional Housing Alternative A. GHG operational emissions include electricity use, natural gas use, mobile sources, emergency generator use, solid waste, and water supply and wastewater; as well as GHG emissions from construction activities.

The total estimated GHG emissions in 2035 in the study area with buildout of Additional Housing Alternative A are presented in **Table 7A.7-1**, below. Development and growth under Additional Housing Alternative A would emit total GHG emissions of approximately 137,295 $MTCO_2e$ per year in 2035 (11,883 $MTCO_2e$ per year more than the proposed Project in 2035). The dominant GHG emissions sources would be almost evenly distributed between transportation, electricity imported to campus, and natural gas which contribute 37 percent, 28 percent, and 29 percent of the total inventory, respectively. This GHG emission rate is an approximate 9 percent increase over both the 2018 baseline emissions as well as the emissions under the proposed Project.

[24] The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing GHG emissions analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-GHG included in this document.

TABLE 7A.7-1
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE A

GHG Source	GHG Emissions under the Proposed Project (metric tons CO2e per year)	GHG Emissions under Additional Housing Alternative A (metric tons CO2e per year)
Electricity		
PG&E Commercial	27	27
PG&E Searsville/Olmstead	37	37
New Faculty/Staff Housing	279	1,468
Direct Access	454	454
Imported to Campus and CEF	35,628	35,677
Non-Stanford Commercial	419	419
Subtotal	**36,844**	**38,082**
Natural Gas		
PG&E Residential	4,281	4,333
PG&E Commercial	20,559	20,559
PG&E Searsville/Olmstead	71	71
New Faculty/Staff Housing	347	1,823
Hot Water Generators	7,104	7,104
Replacement Process Steam Plant	5,770	5,770
Subtotal	**38,131**	**39,659**
Mobile Sources		
Worker Trips	15,524	14,506
Resident Trips	14,222	22,763
Campus Vehicles On-road	1,170	1,170
Campus Vehicles Off-road	235	235
Other Trips	11,767	11,894
Subtotal	**42,919**	**50,569**
Emergency Generators		
Subtotal	**444**	**444**
Solid Waste		
Subtotal	**5,286**	**6,145**
Water Transport and Treatment		
Domestic Water Use	320	413
Wastewater Treatment	121	156
Direct Wastewater Emissions	633	818
Subtotal	**1,074**	**1,387**
Miscellaneous Sources		
On-Campus Research and Fire Suppression	294	294
Construction Equipment	420	713
Subtotal	**714**	**1,007**

TABLE 7A.7-1 (CONTINUED)
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE A

GHG Source	GHG Emissions under the Proposed Project (metric tons CO2e per year)	GHG Emissions under Additional Housing Alternative A (metric tons CO2e per year)
Total GHG Emissions 2035 with Buildout of Additional Housing Alternative A	**125,412**	**137,295**
Service Population	**68,781**	**75,078**
Emissions per Service Population	**1.8**	**1.8**
2030 Service Population Threshold	**2.7**	**2.7**
Exceeds 2030 Threshold?	**No**	**No**
2035 Service Population Threshold based on progress to 2050	**2.1**	**2.1**
Exceeds 2035 Threshold?	**No**	**No**

NOTES: The service population, comprised 49,479 workers, 25,599 residents and 19,668 workers who are residents, as derived from population estimates the SB 743 VMT Analysis prepared by Stanford for the additional housing alternatives.

SOURCE: Ramboll, 2018 (see Appendix ALT-GHG)

As with the 2035 inventory used for the proposed Project, the 2035 inventory for Additional Housing Alternative A was conservatively developed using 2030 emission factors. As a result, the electricity intensity factor, mobile emission factors, and other GHG sources are expected to continue to decrease after 2030 to meet California's long-term GHG reduction goals.

Additional Housing Alternative A would result in emissions of 1.8 MT of CO_2e per service population, similar to the proposed Project. This is below the 2.7 MT of CO_2e per service population threshold to determine consistency with the reduction goals established under SB 32 and EO B-30-15 for year 2030. The emissions of 1.8 MT of CO_2e per service population under Additional Housing Alternative A would also be below the 2.1 MT of CO_2e per service population threshold significance criterion developed for determining the GHG reduction trajectory toward 2050.

While the total GHG emissions under Additional Housing Alternative A would be 9 percent above the GHG emissions under the 2018 baseline (and Project) conditions, GHG emissions under Additional Housing Alternative A, similar to the proposed Project, would be below the significance thresholds that relate to consistency with GHG reduction goals for year 2030 and, to the extent feasible, year 2050. Similar to the proposed Project, Additional Housing Alternative A would not generate GHG emissions, either directly or indirectly, that would make a cumulatively considerable contribution to a significant impact on global climate change. Thus, this impact is less than significant.

Mitigation: None required.

Impact 7A.7-2: Additional Housing Alternative A could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*Significant*)

The consistency of Stanford's operations with respect to state and local GHG reduction plans under the proposed 2018 General Use Permit was assessed in Section 5.7 of the Draft EIR. Plans, executive orders and regulations considered in this evaluation included:

- Assembly Bill 32 (AB32)
- The AB 32 Scoping Plan
- Plan Bay Area
- Executive Order B-30-15
- Senate Bill 32
- Executive Order No. S-3-05
- The 2017 Clean Air Plan
- Health Element of the County of Santa Clara General Plan

Additional Housing Alternative A's consistency with these plans, policies, and executive orders would essentially be the same as under the proposed Project, as discussed below.

Assembly Bill 32

The primary goal of AB 32 is the requirement for statewide GHG emissions to be reduced to 1990 levels by 2020. BAAQMD developed an efficiency metric of 4.6 MT of CO_2e per service population or less as indicative of a proposed plan or mixed use development as sufficient for achieving the year 2020 of AB32 (BAAQMD, 2009). As indicated in Table 7A.7-1, similar to the proposed Project, emissions under Additional Housing Alternative A would be well below this efficiency metric. Thus, as under the proposed Project, Additional Housing Alternative A would not conflict with the primary goal of AB 32.

CARB Scoping Plan

The AB 32 Scoping Plan identifies over 70 measures for reducing greenhouse gas emissions to 1990 levels by 2020. Specific measures discussed in the Scoping Plan that are relevant to the proposed Project include the Renewables Portfolio Standard (RPS) and Advanced Clean Cars program.

As discussed in the Environmental Setting of Section 5.7 in the Draft EIR, notable recent changes to Stanford's energy systems have occurred in combination with the renewable sources that utilities must use to comply with California's Renewables Portfolio Standard (RPS), resulting in the anticipated total percentage of Stanford's electricity from renewable sources would be over 65 percent under Additional Housing Alternative A in 2035, similar to the proposed Project.

Vehicle GHG emission limits required by regulation combined with low carbon fuel standards will reduce the campus's vehicular GHG emissions on a per service population basis. As under the proposed Project, additional emissions reductions would result from Stanford's proposed

electrification of all its Marguerite, LBRE and Bonair vehicle fleets by 2035 under Additional Housing Alternative A. Consequently, similar to the proposed Project, through its past and ongoing proactive actions, and with implementation of Additional Housing Alternative A, Stanford would be consistent with elements of the Scoping Plan relevant to its operations.

Plan Bay Area

MTC estimates increases in both residents and workers at Stanford in its 2040 growth projections under Plan Bay Area. Similar to the proposed Project, Additional Housing Alternative A is consistent with the SCS in terms of proposing additional residences and academic square footage in locations specified in the SCS for such development. In addition, the VMT analysis presented in Transportation and Traffic indicates that Additional Housing Alternative A would generate VMT per worker and VMT per capita rates that are below the regional averages, similar to the proposed Project.

As under the proposed Project, because Additional Housing Alternative A would locate residents and workers where envisioned by the SCS, and would generate less VMT per capita and VMT per worker compared to the existing regional averages, it would not conflict with the regional goals and targets expressed in the *Plan Bay Area Sustainable Communities Strategy.*

Executive Order B-30-15 and SB 32

Executive Order B-30-15 established a GHG emission reduction goal for California of 40 percent below 1990 levels by 2030. The GHG emissions total presented in Table 7A.7-1 conservatively represents the emissions inventory for Additional Housing Alternative A at full build-out in 2035. As explained in the preceding impact analysis, similar to the proposed Project, the emissions under Additional Housing Alternative A would be below the 2030 service population target calculated based on the GHG reduction goal established under SB 32 and EO B-30-15 (40 percent reduction below 1990 levels by 2030, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Similar to the proposed Project, Additional Housing Alternative A would not conflict with SB 32 (or with the 2017 Scoping Plan that implements SB 32) and EO B-30-15, and Stanford's GHG emissions under Additional Housing Alternative A would be below the efficiency metric threshold derived for year 2030 reduction goals.

Executive Order S-3-05

Executive Order No. S-3-05 established a goal of reducing the State's GHG emissions to 80 percent below the 1990 level by the year 2050. Similar to the proposed Project, GHG emissions under Additional Housing Alternative A would be lower than the service population target calculated for 2035 based on the trajectory needed to achieve the GHG reduction goal established under EO S-3-05 (80 percent reduction below 1990 levels by 2050, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Therefore, as under the proposed Project, Additional Housing Alternative A would not conflict with the attainment of the State's long-term GHG reduction goal for 2050.

BAAQMD 2017 Clean Air Plan

The 2017 Clean Air Plan contains transportation measures and measures related energy, green building, waste management, water control of short-lived GHGs. Those Clean Air Plan measures

applicable to the Project are identified in **Table 5.2-11** in Section 5.2, Air Quality of the Draft EIR. Table 5.2-11 provides a brief description of the control measure and identifies any existing or proposed mechanism that Stanford and surrounding local jurisdictions and transit agencies would have in place to implement these measures. All existing mechanisms or those included in the proposed 2018 General Use Permit would also be part of Additional Housing Alternative A and, therefore, would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. Because there are some control measures with which the Project as proposed may not be consistent, this impact is also considered significant under Additional Housing Alternative A. Where an implementation mechanism does not currently exist or is not identified in Additional Housing Alternative A, mitigation measures are identified below to ensure its consistency with the 2017 Clean Air Plan.

County of Santa Clara General Plan

In 2015, the County of Santa Clara adopted a new Health Element of the General Plan. The Health Element contains five policies that may be interpreted to address climate change and GHG emissions. The first of these is Policy HE-G.5, which directs the County to support efforts to reduce transportation-related GHG emissions. Like the proposed Project, Additional Housing Alternative A addresses this policy by Stanford's continued implementation of its TDM programs which are designed to achieve the Stanford Community Plan's No Net New Commute Trips standard.

Policy HE-G.10 directs the County to promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions, and Policy HE-G.17 directs the County to promote energy retrofits and increase extreme heat resiliency for housing. Similar to the proposed Project, development under Additional Housing Alternative A would address these policies through implementation of Stanford's Climate and Energy Plan, which sets forth high-performance, whole-building energy performance targets specifically for each new building. As under the proposed Project, these requirements would ensure that development under Additional Housing Alternative A would be consistent with Policies HE-G.10 and HE-G-17.

Policy HE-G.11 directs the County to encourage renewable energy, such as solar and wind turbines on commercial, industrial and residential buildings. Similar to the proposed Project, under Additional Housing Alternative A, Stanford's updated campus-wide energy system, and heat recovery systems would provide renewable energy in addition to procuring electricity from its Solar Generating Station in Kern County as well as generating additional electricity from its on-campus rooftop solar installations, providing part of the campus's electricity demand. Therefore, as under the proposed Project, development under Additional Housing Alternative A would be powered and heated via these renewable energy sources, and hence would implement the intent of Policy HE-5.11.

Policy HE-G.16 directs the County to implement heat island mitigation by supporting urban greening and the use of green infrastructure to minimize the urban heat island effect. Stanford's Guidelines for Sustainable Buildings includes strategies for using microclimate and environmentally responsive design which include designing sites to reduce "heat island" effects, as

discussed in the Draft EIR. Similar to the proposed Project, implementation of these strategies would make Additional Housing Alternative A consistent with Policy HE-G.16.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7A.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 7A.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 7A.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 7A.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Climate change is the cumulative effect of all natural and anthropogenic sources of GHGs accumulated on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change, and thus the assessment of GHG emissions impacts is inherently a cumulative analysis.

The analysis in Impact 7A.7-1 uses the BAAQMD CEQA Guidelines service population metric to assess the significance of the contribution to cumulative global GHG emissions under Additional Housing Alternative A. Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to particular global climate changes.

Both BAAQMD and the California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate. Therefore, the evaluation of cumulative GHG impacts presented above evaluates whether Additional Housing Alternative A would make a considerable contribution to cumulative climate change effects. This is the same finding as under the proposed Project.

Hazards and Hazardous Materials

Construction Impacts

Impact 7A.8-1: Under Additional Housing Alternative A, demolition of existing structures that contain hazardous building materials would not create a significant hazard associated with exposure of workers, the public, or the environment from the transport, use, or disposal of these hazardous materials and waste. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. As a result, this alternative would result in more demolition and/or and modifications of existing improvements and structures on the Project site than under the proposed Project, and correspondingly, greater potential exposure of construction workers, the public, or the environment to hazardous materials such as lead-based paint (LBP), asbestos containing materials (ACMs), mercury and polychlorinated biphenyls (PCBs). However, as under the proposed Project, potential exposure to these hazardous building materials under this alternative would be eliminated or reduced to legally acceptable levels through compliance with abatement measures required as part of applicable federal, State and local regulations implemented through Stanford's Department of Environmental Health and Safety (EH&S) programs and overseen by County of Santa Clara Hazardous Materials Compliance Division (HMCD). Therefore, similar to the proposed Project, this impact for this alternative would be less than significant.

Mitigation: None required.

Impact 7A.8-2: Under Additional Housing Alternative A, construction projects could disturb soil and groundwater contaminated by historical hazardous material use, which could present risks the health of construction workers, the public, and/or the environment. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in overall greater soil disturbance on the Project site during construction compared to the proposed Project, and thus, would have a corresponding greater overall potential to disturb groundwater. Under this alternative, as under the proposed Project, if potential disturbance occurs in areas previously contaminated by hazardous materials, construction workers, the public, and/or the environment may be exposed to a localized release of compounds considered hazardous to human health or the environment, which would be a significant impact. However, implementation of **Mitigation Measure 7A.8-2(a)-(c)** identified for this alternative, which is the same as that identified for the proposed Project, establishes protocols for construction activities that would reduce or eliminate

the potential risks to public or construction worker health, or the environment, reducing this impact to a less than significant level.

Mitigation Measure 7A.8-2(a): During construction within the Project site, any contractor shall cease any earthwork activities upon discovery of any suspect soils or groundwater (e.g., petroleum odor and/or discoloration) during construction. The contractor shall notify Stanford's Department of Environmental Health and Safety (EH&S) and the County of Santa Clara's Hazardous Materials Compliance Division (HMCD) of the Department of Environmental Health upon discovery of suspect soils or groundwater. EH&S will retain a qualified environmental firm to collect soil samples to confirm the level of contamination that may be present.

Mitigation Measure 7A.8-2(b): If contamination is found to be present, any further proposed soil- or groundwater-disturbing activities within areas of identified or suspected contamination shall be conducted according to a site specific health and safety plan, prepared by a California state licensed professional. The contractor shall follow all procedural direction given by County HMCD and/or identified in a Soil and Groundwater Management Plan prepared for the site by a qualified environmental firm to ensure that suspect soils are isolated, protected from runoff, and disposed of in accordance with transportation laws and the requirements of the licensed receiving facility (in coordination with EH&S).

Mitigation Measure 7A.8-2(c): If contaminated soil or groundwater is encountered and identified constituents exceed human health risk levels, it shall be delineated, removed, and disposed of offsite in compliance with the overseeing agency, either County HMCD or Regional Water Quality Control Board (RWQCB), as well as the receiving facilities' requirements.

Significance after Mitigation: Less than Significant.

Impact 7A.8-3: Improper handling or storage of hazardous materials during Additional Housing Alternative A construction activities could result in spills would not significantly increase public health and/or safety risks to future residents, maintenance workers, visitors, and the public and environment in the area surrounding the spill. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. As a result, this alternative would use more of certain hazardous materials such as fuels, oils, solvents, and glues during construction than the proposed Project, the inadvertent release of which could adversely impact workers, the public, soil, surface waters, or groundwater quality. Similar to the proposed Project, the use of construction best management practices implemented as part of a SWPPP as required by the NPDES General Construction Permit under this alternative would minimize the potential adverse effects to workers, the public, surface waters, groundwater and soils. Similar to the proposed Project, given the protective measures required to comply with federal, State, and local laws and regulations (i.e., best management practices) and the quantities of hazardous materials typically needed for construction projects, the potential exposure of construction workers or the public, or

contamination of soil and/or groundwater, from construction-related hazardous materials under this alternative would be considered a less-than-significant impact.

Mitigation: None required.

Operational Impacts

Impact 7A.8-4: Operation of uses developed under the Additional Housing Alternative A that could involve the transportation, use, storage and disposal of hazardous materials, would not present significant public health and/or safety risks to residents, visitors, and the surrounding area. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit. As a result, this alternative would have a corresponding increase in transportation, use, storage and disposal of hazardous materials associated with operation of these uses compared to the proposed Project. As described for the proposed Project, residential uses would typically include use of familiar hazardous materials such as toners, paints, and household cleaning products; and any building maintenance and landscaping activities associated with residential uses commonly involve use of fuels, oils, paints, lubricants, solvents, and pesticides. These common types of materials are typically stored and used in small quantities, and used in accordance with manufacturer recommendations. As such, the routine transport, use, storage or disposal of these materials under this alternative would not be reasonably expected to cause an adverse impact to the public and the environment.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, impacts associated with transportation, use, storage and disposal of hazardous materials associated with operation of those facilities under this alternative would be similar to the proposed Project. Development and operation of those facilities under this alternative would be subject to the same applicable regulatory requirements, and same oversight by Stanford's EH&S and the County's HMCD, as the proposed Project, which would similarly ensure potential exposure of people or the environment to hazardous materials would be a less than significant impact.

Mitigation: None required.

Impact 7A.8-5: Hazardous materials used at facilities operating under Additional Housing Alternative A could potentially be spilled through upset or accidental conditions, but would not significantly increase public health and/or safety risks to future residents, workers, visitors, and the surrounding area. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated infrastructure, than the proposed 2018 General Use Permit. Any potential accidental releases of hazardous materials or wastes associated with operation of additional on-campus residential uses

would be small in scale; similar to the proposed Project, potential effects to residents, workers, the public or the environment under this alternative would be less than significant.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, potential accidental releases of hazardous materials or wastes associated with operation of those facilities, and related potential adverse effects to residents, workers, the public or the environment would be similar to the proposed Project. Operation of those facilities would be subject to the same applicable regulatory requirements and management programs, and same oversight by Stanford's EH&S and the County's HMCD, as the proposed Project; the potential impact to workers, residents, visitors, or the environment would therefore be reduced to a less-than-significant level.

Mitigation: None required.

Impact 7A.8-6: New development under Additional Housing Alternative A could potentially be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thus, could result in a safety hazard to the public or environment. (*Potentially Significant*)

Additional Housing Alternative A would involve overall more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit, and therefore, would have a greater potential to develop in areas on the campus where residual hazardous materials may be present in the soil and cause significant impacts. However, implementation of **Mitigation Measures 7A.8-2(a)**, **7A.8-2(b)**, and **7A.8-2(c)** identified for this alternative, which are the same as those identified for the proposed Project, would ensure that any earthwork activities that occur on the Project site that may encounter suspicious materials would be adequately addressed, and thus, the potential for residual contamination to significantly impact the public or environment would be less than significant post-mitigation.

Mitigation: Implement Mitigation Measure 7A.8-2(a)-(c).

Significance after Mitigation: Less than Significant.

Impact 7A.8-7: Implementation of Additional Housing Alternative A could result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school, but would not create a significant hazard to those facilities. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit that could be located within one-quarter mile of an existing or proposed school. As discussed above, operation of residential uses involves common hazardous materials that are typically stored and used in small quantities. Accordingly, there are no characteristics associated with operation of the additional housing that

would result in substantial hazardous emissions or handling of hazardous or acutely hazardous materials, substance, or waste that would result in adverse exposure to hazardous emissions at nearby schools.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, this alternative would similarly not include a substantive change in hazardous emissions, and all transportation, use, storage, and disposal of hazardous materials would be conducted in accordance with applicable local, State, and federal requirements. Therefore, similar to the proposed Project, implementation of the alternative would not result in any adverse exposure to hazardous emissions to existing or future schools within, or in the vicinity of, the Project site.

Mitigation: None required.

Impact 7A.8-8: Development facilitated by Additional Housing Alternative A would not substantially impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

Additional Housing Alternative A would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit. Therefore, this alternative would increase the on-campus residential population that would be served by emergency response and evacuation plans. As with new development proposed under the Project, any changes to the circulation network that may occur to accommodate additional housing under this alternative would be designed to accommodate appropriate emergency access to, and egress from, all areas of the Project site. Additionally, similar to the proposed Project, all project-specific designs, including private internal circulation and building site plans for the additional housing under this alternative would be subject to review and approval by emergency service providers, per Fire Code requirements. As with the proposed Project, under this alternative Stanford would continue to operate its Office of Emergency Management (OEM) and coordinate emergency response planning efforts with applicable jurisdictional emergency response providers, including County OEM; and also continue to maintain its emergency notification systems at Stanford via its AlertSU strategy. Therefore, similar to the proposed Project, these emergency response requirements would ensure this alternative would not substantially impair implementation of or physically interfere with any emergency response or evacuation plans. Impacts would be similar to those of the proposed Project.

Mitigation: None required.

Impact 7A.8-9: Development under Additional Housing Alternative A would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. (*Less than Significant*)

Additional Housing Alternative A would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would increase the on-campus residential structures and residential population on the campus that would be exposed to risk involving wildland fires. This alternative would not introduce housing development or increase population within the foothills, designated by the County as a wildland/urban interface. Rather, and similar to proposed Project, all additional housing that would be developed under this alternative would be located within the Academic Growth Boundary, including on infill and redevelopment sites. Similar to the proposed Project, additional on-campus housing that would be developed under this alternative would be required to include fire suppression design requirements as specified in current adopted building codes, and would be served by sufficient fire protection services. As with the proposed Project, implementation of applicable fire and building code standards would ensure that adequate fire and life safety measures are incorporated into the alternative in compliance with all applicable state and local fire safety regulations. Similar to the proposed Project, these factors would reduce the potential impact associated with exposure of people and property to risk involving wildland fires under this alternative to a less than significant level.

Mitigation: None required.

Cumulative Impacts

Impact 7A.8-10: Hazards at the Additional Housing Alternative A site, in combination with past, present, and future projects could potentially contribute to cumulative hazards. (*Potentially Significant*)

The geographic scope of potential cumulative hazards and hazardous materials impacts encompasses primarily the Project site and immediate surrounding area. Cumulative hazardous materials effects could occur if activities that would occur under Additional Housing Alternative A at the Project site, and other past, existing and proposed development, together, would significantly increase risks in the vicinity of the Project site. As discussed above, the additional housing that would occur under this alternative would involve routine hazardous materials in relatively small quantities. As under the proposed Project, based on the existing management of hazardous materials and the continued oversight, guidance and compliance monitoring that would be conducted by Stanford's EH&S and/or County HMCD for all development on the campus, there would not be a substantial change in how hazardous materials are handled under this alternative. As a result of these existing regulatory requirements that apply to the Project site, and given that nearby off-site land uses would be subject to their own applicable regulations and internal standard operating procedures controlling the use, storage, and disposal of hazardous materials, the potential hazardous materials and hazard impacts would not combine to become cumulatively considerable.

Similar to the proposed Project, this alternative, as well as other past, present, and future projects would be required to adhere to existing regulatory requirements for the appropriate handling, storage, transportation, and disposal of hazardous materials that are designed to minimize exposure and protect human health and the environment. Cumulative increases in the transportation of hazardous materials and wastes would cause a less than significant impact because the probability of accidents is relatively low, and the use of legally required packaging minimizes the consequences of potential accidents.

During construction, implementation of Mitigation Measure 7A.8-2(a)-(c) would also reduce any contribution from this alternative to potential cumulative disturbance of soil and groundwater. Given this and all the other factors discussed above, the cumulative impact of this alternative to hazards and hazardous materials would be less than significant.

Mitigation: Implement Mitigation Measures 7A.8-2(a)-(c).

Significance after Mitigation: Less than Significant.

Impact 7A.8-11: Additional Housing Alternative A, in combination with past, present, and future projects would not substantially impair implementation or physically interfere with emergency response or evacuation plans. (*Less than Significant*)

As discussed in Impact 7A.8-11, above, site review for individual building projects and existing emergency response requirements are sufficient to ensure that the alternative's effect on potential impairment or implementation of any emergency response or evacuation plans would be considered a less-than-significant impact. Furthermore, regional plans such as the Local Hazard Mitigation Plan and the Santa Clara County Operational Area Emergency Operations Plan (EOP) are adaptive to changes in population and provide the inter-agency coordination to ensure that emergency response and evacuation can be effectively coordinated in an emergency. Therefore, the effects of the alternative would not combine to become cumulatively considerable.

Mitigation: None required.

Impact 7A.8-12: Additional Housing Alternative A, in combination with past, present, and future projects would not substantially contribute cumulatively to exposure to wildland fires. (*Less than Significant*)

Additional Housing Alternative A, as well as other land uses in the Project site vicinity would include the proper mechanisms to ensure the alternative's potential impacts to wildland fire hazards and emergency response access would be less than significant, and correspondingly, would also ensure the alternative's contribution to cumulative effects on wildland fires would also be less than significant.

Mitigation: None required.

Hydrology and Water Quality

Construction Impacts

Impact 7A.9-1: Additional Housing Alternative A construction could violate water quality requirements or waste discharge requirements, or otherwise degrade water quality. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in correspondingly greater earthwork activities during construction such as removal of surface vegetation, grading and excavation of soils, and potential placement of imported soil, which would could result in increased erosion and sedimentation. Similar to the proposed Project, as part of the approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, including implementation of construction BMPs, as detailed in a SWPPP, along with any additional use permit conditions that must be met regarding stormwater control and management during construction.

Similar to the proposed Project, inactive wells, if not abandoned appropriately, can present potential conduits for contamination from the surface to underlying groundwater resources. Unless the existing potential conduits are eliminated, this would be a significant impact under this alternative. Implementation of **Mitigation Measure 7A.9-1**, which is the same as that identified for the proposed Project, would require Stanford to refer to the well survey, prior to obtaining a demolition or grading permit for individual projects under this alternative to ensure that there are no wells within each building site that might need to be appropriately abandoned to eliminate this pathway for contamination.

Implementation of SWPPP requirements, as well as Mitigation Measure 7A.9-1, would prevent significant construction-related impacts to water quality, and ensure that all construction activities that would under occur under the alternative would minimize the potential to adversely affect receiving waters. Therefore, during construction, the potential water quality impacts of this alternative would be less than significant post-mitigation, similar to the proposed Project.

> **Mitigation Measure 7A.9-1:** Prior to issuance of a demolition or building permit, Stanford shall review its historic wells survey and confirm that no historic wells not properly closed are located at the project location to determine the potential for encountering any groundwater wells within the area of proposed improvements. If discovered, and the well is no longer part of operations and was not abandoned in accordance with SCVWD requirements, Stanford shall fulfill the well abandonment/ destruction permit requirements. Stanford shall contact SCVWD to locate existing inactive wells and confirm adherence to well abandonment/ destruction requirements.

Significance after Mitigation: Less than Significant.

Impact 7A.9-2: Additional Housing Alternative A construction could include temporary dewatering, but would not substantially deplete groundwater supplies or cause a lowering of the water table. ***(Less than Significant)***

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. Consequently, this alternative would require greater excavation of soils related to underground utilities, construction of building foundations, and in some cases, to accommodate underground levels, than the proposed Project. Similar to the proposed Project, if shallow groundwater were to be encountered during construction, excavations could require temporary dewatering of groundwater to create a dry working environment in order to complete construction.

Similar to the proposed Project, to address the possibility of rising groundwater at the Project site in the future, in the event that any new subgrade construction under this alternative would encounter several vertical feet of groundwater necessitating dewatering, Stanford would, as standard practice, stipulate a geologic/geohydrologic analysis be conducted to assess the potential for any localized consolidation/settlement effects, and identify appropriate measures to protect adjacent structures and infrastructure during construction.

As with construction related to the proposed Project, potential construction dewatering associated with this alternative would only be required for the duration of a portion of the construction period of an individual project. As a result, similar to the proposed Project, construction dewatering under this alternative would not result in long-term, large volume groundwater withdrawal that would lead to substantive depletion of groundwater supplies, permanent lowering of groundwater levels, or seasonal basin recharge. Therefore, as with the proposed Project, the potential impact to groundwater supplies and the water table during construction of individual projects under this alternative would be less than significant.

Mitigation: None required.

Operational Impacts

Impact 7A.9-3: Operation of Additional Housing Alternative A would not violate water quality requirements or waste discharge requirements, or otherwise substantially degrade water quality. ***(Less than Significant)***

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would result in more on-campus impervious surfaces compared to the proposed Project. Any increases in paved areas, building rooftops and parking lots under this alternative would have the potential to generate

more polluted stormwater during storm events than under the proposed Project. Similar to the proposed Project, if not managed appropriately, increases in polluted stormwater would have the potential to violate water quality standards. Relatedly, any potential increase in use of herbicides and pesticides under this alternative associated with additional landscaping could adversely affect the quality of receiving surface waters or groundwater.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, along with any additional use permit conditions that must be met, regarding stormwater control and management during operation. As with the proposed Project, adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit would minimize the water quality impact from development that would occur under this alternative to a less-than-significant level by requiring all proposed development to include stormwater design measures that protect water quality.

Mitigation: None required.

Impact 7A.9-4: Additional Housing Alternative A operation could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. (*Potentially Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would result in more on-campus impervious surfaces compared to the proposed Project. As discussed in Section 5.9, Hydrology and Water Quality, the SCVWD has delineated an area known of the Project site known as the Unconfined Zone, where groundwater recharge by infiltration primarily occurs (as shown in Figure 5.9-4). Two of the four development districts which this alternative would add additional housing to – West Campus and East Campus – are located partially within the Unconfined Zone. The other two development districts which this alternative would add additional housing to – Quarry, and DAPER and Administrative Development Districts – are located completely outside the Unconfined Zone. If, under this alternative, increases in impervious surfaces from additional housing were introduced in this area of groundwater recharge, the amount of runoff that recharges into the underlying aquifer could be further reduced, a significant impact as with the proposed Project.

Similar to the proposed Project, new development under this alternative would be required to include on-site drainage plans designed to retain, capture and convey increased runoff in accordance with the SCVURPPP design standards and the Municipal Regional MS4 NPDES permit requirements that include Provision C.3 site control features. As a result, the additional housing associated with this alternative would be required to minimize the amount of stormwater discharge offsite. See also discussion of Stanford's detention facilities in Impact 7A.9-6, below, which encourage groundwater recharge.

Pursuant to the 2000 General Use Permit, Stanford implements a campus-wide plan for groundwater recharge to mitigate the loss of recharge areas from development that occurs within the Unconfined Zone; this involves the conveyance of a quantifiable amount of water from Stanford's irrigation water supply to Lagunita reservoir, and the percolation of that water as recharge into the Unconfined Zone. Similar to mitigation identified for the proposed Project, **Mitigation Measure 7A.9-4**, below, would require continued implementation of this groundwater recharge plan with annual reporting to the County would ensure that future development that would occur in the Unconfined Zone under this alternative would not result in adverse effects to underlying groundwater levels.

As under baseline and proposed Project conditions, under this alternative, Stanford's groundwater wells would be used to supplement local surface water sources for the non-potable landscape irrigation system and, if needed, for the Lagunita reservoir to maintain water levels. Also, as under baseline and proposed Project conditions, under this alternative, Stanford would operate within its secured water rights for surface water diversion for non-potable uses. The additional housing that would be developed on-campus under this alternative would consist of multi-family housing, which would minimize the demand for non-potable water required for landscaping. Additionally, as under the proposed Project, Stanford would use low-water-demand native plants in landscaped areas of the campus, minimizing the non-potable water demand. As a result, total landscape irrigation demand under this alternative would be similar to the proposed Project, and would not expected to substantively change from baseline conditions.

However, based on a Water Supply Assessment (WSA) prepared by Stanford for the Additional Housing Alternative A (see Utilities and Service Systems below for additional detail), in single and multiple dry water year scenarios, Stanford would need to supplement its potable water supply (i.e., its guaranteed allocation of potable water purchased wholesale from San Francisco Public Utilities Commission) with treated groundwater from its wells in order to accommodate the estimated increase in potable water demand from the additional on-campus housing. Under all water year scenarios, the total groundwater demand for this alternative would not exceed 1.35 mgd (see Utilities and Service Systems, below, for additional detail). As discussed in Section 5.16, Stanford can withdraw up to 1.52 mgd from its wells without adversely affecting groundwater conditions. As a result, similar to the proposed Project, the projected groundwater use for this alternative could be safely withdrawn without causing excessive drawdown in the aquifer. Additionally, Stanford could implement more stringent water conservation measures beyond those implemented historically to further minimize increases in groundwater use.

This alternative would also involve more subsurface construction than the proposed Project. While, as discussed in Section 5.16, Stanford reports that no subgrade building construction to date within the Project site has encountered groundwater, if needed to address the possibility of rising groundwater at the Project site in the future, Stanford would strengthen building foundations to withstand the hydrostatic pressures and waterproofing the structure appropriately. As with the proposed Project, this would avoid any potential localized effects on groundwater levels from conducting long-term groundwater dewatering via pumping for new buildings under this alternative, and correspondingly, avoid adding extracted groundwater to the storm drain system.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with any conditions that must be met regarding groundwater use and recharge during operation. Therefore, the drainage control requirements, the projected use of groundwater wells, and the implementation of the Groundwater Recharge plan as identified in Mitigation Measure 7A.9-4, would assure onsite infiltration such that development that would occur under this alternative would not substantively reduce the aquifer volume or lower the local groundwater level. Similar to the proposed Project, the potential impact under this alternative would therefore be less than significant.

> **Mitigation Measure 7A.9-4:** Stanford Utilities shall review individual projects proposed under the Additional Housing Alternative A for changes in impervious surface area within the Unconfined Groundwater Zone. The accounting of the recharge effort shall be tracked to ensure that all future development will continue to result in an annual net positive recharge in the Unconfined Groundwater Zone. Record of monitored data shall be submitted to the County on an annual basis and Santa Clara Valley Water District and include both water volumes and water quality data.
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> **Significance after Mitigation:** Less than Significant.

Impact 7A.9-5: Additional Housing Alternative A development would potentially alter the drainage pattern of the Project site, but would not result in substantial erosion or siltation on or off the site. (*Less than Significant*)

Additional Housing Alternative A would involve more site development than the proposed Project, and consequently may involve greater alteration of drainage patterns on the Project site. As under the Project, if not managed properly, localized changes in drainage patterns for individual developments that would occur under this alternative could create new impervious surfaces that would increase the amount of surface run-off; and hence cause erosion of exposed soils resulting in sedimentation and siltation of discharge flows on- or off-site.

As discussed in Impact 7A.9-3, above, implementation of design features in accordance with drainage control requirements would be effective in controlling erosion potential and minimizing transport of siltation on or off site. Therefore, similar to the proposed Project, localized changes in on-site drainage patterns associated with development under this alternative would not result in substantial erosion or siltation, and with adherence to stormwater control measures as a part of the Municipal Regional NPDES MS4 stormwater permit, the potential impact is considered less than significant.

> **Mitigation:** None required.

Impact 7A.9-6: Additional Housing Alternative A development would create runoff, but would not exceed the capacity of existing or planned stormwater infrastructure, or result in flooding on- or off-site. (*Less than Significant*)

Additional Housing Alternative A would involve more site development than the proposed Project, and consequently would involve more impervious surfaces on the Project site. Similar to the proposed Project, if any resulting increases in stormwater were not managed properly, this alternative could result in an increase in peak flows in, and potentially affecting the capacity of, the downstream storm drainage infrastructure, and potentially exacerbate existing or create new flooding conditions.

As under the proposed Project, in order to accommodate post-development increases in runoff from new development under this alternative, each individual project would be required to develop a drainage plan that complies with the County's drainage design standards and the requirements of the SCVURPPP including flow control, and NPDES Provision C.3 requirements for storm capacity minimums. The County's drainage design standards require that project stormdrainage infrastructure be designed to adequately convey all runoff from peak storm events. Any potential increases in stormwater runoff resulting from additional impervious surfaces must be detained to ensure peak flows do not result in on-site or downstream flooding.

As discussed in Section 5.9, Hydrology and Water Quality, as a condition of the 2000 General Use Permit, Stanford developed on-site detention facilities on a watershed basis to create sufficient capacity to offset increased runoff associated with all new impervious surfaces constructed under the 2000 General Use Permit. In 2018, the existing detention facilities are estimated to have the capacity for accommodating an additional approximate 57.0 acres (2.48 million square feet) of impervious surfaces in the San Francisquito watershed, and an additional approximate 194.8 acres (8.52 million square feet) of impervious surfaces in the Matadero watershed. In accordance with Stanford Community Plan Policy SCP-HS 9, all development would require infrastructure improvements to accommodate runoff so as to achieve no increase in peak flow rate. Similar for the proposed Project, this remaining detention capacity would also be more than adequate to accommodate the net increase in impervious surfaces that would occur under this alternative.

As discussed in the Project Description for Additional Housing Alternative A, the placement of housing at the edges of the West Campus and DAPER Development Districts under this alternative could require development of lands that are currently used for existing recreation fields and/or detention basins located in these areas. Under this circumstance, Stanford would provide replacement stormwater detention facilities with an equivalent detention capacity.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, along with any conditions that must be met, regarding stormwater control and management during operation. Pursuant to the County-approved Stanford Storm Drainage Master Plan, Stanford reports to the County annually regarding the remaining capacity for the existing detention facilities. The detention facilities are designed to accommodate the 100-year design storm flow. Mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements, as required by law,

would ensure that proposed development under the alternative would include adequate storm drainage control features, including potential detention facilities and features that promote onsite infiltration. As such, similar to the proposed Project, effects on increases in peak runoff and capacity of existing or planned stormwater infrastructure under this alternative would be considered less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7A.9-7: Additional Housing Alternative A, in combination with past, present, and future projects could potentially contribute to surface and groundwater quality impacts. *(Potentially Significant)*

The geographic scope of potential hydrology and water quality impacts are the study watersheds. Construction and operation of the development under this alternative, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively increase stormwater runoff and pollutant loading in the study watersheds, and hence, to the San Francisco Bay. Construction related to alternative, in combination with other cumulative development, could also affect groundwater quality. As under the proposed Project, development associated with this alternative and other current and future projects in the watersheds would be required to comply with current construction, drainage and grading requirements intended to control runoff and regulate water quality at each site. Similarly, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. As with the proposed Project, new development projects in the affected watersheds in Santa Clara and San Mateo Counties also would be required to comply with the regionally based MS4 NPDES permitting requirements. All construction work disturbing more than one acre in the surrounding areas would require permits from the RWQCB which require all activities to implement BMPs to minimize adverse effects to water quality. The NPDES permits, both the General Construction Permit and the MS4, are based upon addressing cumulative contributions to a watershed and as a result include requirements to implement BMPs that protect water quality to the maximum extent practicable. Further, Mitigation Measure 7A.9-1 would serve to minimize any contribution from this alternative to significant cumulative effects on groundwater quality. Therefore, similar to the proposed Project, the effect of this alternative on surface and groundwater quality, in combination with other cumulative projects, would be less than significant.

Mitigation: Implement Mitigation Measure 7A.9-1.

Significance after Mitigation: Less than Significant.

Impact 7A.9-8: Additional Housing Alternative A, in combination with past, present, and future projects could potentially contribute to depletion in groundwater supplies or interfere with groundwater recharge. ***(Potentially Significant)***

As with the proposed Project, construction and operation of the proposed development under this alternative, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively decrease groundwater supplies and interfere with groundwater recharge. As discussed in Section 5.9, Hydrology and Water Quality, the Santa Clara Valley Groundwater Basin is not currently in an overdraft condition and is actively managed by the SCVWD. The SCVWD is designated by the DWR as the exclusive Groundwater Sustainability Agency (GSA) for the Santa Clara Subbasin, which comprises a portion of the larger Santa Clara Valley Basin. A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. A GSA must submit and implement a GSP or prescribed alternative under the Sustainable Groundwater Management Act of 2014. The SCVWD submitted the 2016 Groundwater Management Plan for the Santa Clara and Llagas Subbasins to DWR as an Alternative to a GSP in December 2016. Under this alternative, Stanford would also continue implementation of the Campus-wide Plan for Groundwater Recharge, as specified in Mitigation Measure 7A.9-4, above, to ensure that any loss of recharge areas due to new development under this alternative is addressed through management of Lagunita reservoir as described above. Therefore, considering the projected use of groundwater for the alternative, the proposed landscaping vegetation, current and future management of the groundwater basin and continued adherence to the groundwater recharge plan as overseen by SCVWD, there would be a less than significant cumulative impact to groundwater levels or supplies under this alternative.

Mitigation: Implement Mitigation Measure 7A.9-4.

Significance after Mitigation: Less than Significant.

Impact 7A.9-9: Additional Housing Alternative A, in combination with past, present, and future projects would not result in substantial adverse cumulative surface hydrology impacts. (*Less than Significant*)

Implementation of this alternative, together with past present and other reasonably foreseeable future projects in the vicinity, could also expose people and/or property to flooding from a 100-year event. These effects could occur through increases in stormwater runoff volumes that overwhelm drainage infrastructure or during high tide in a 100-year storm event along with sea level rise in the Bay. This alternative and other cumulative projects in the vicinity would be required to comply with flood control requirements intended to provide flood protection. Additionally, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. New development projects in the County also would be required to comply with County flood control requirements. As discussed above, as with the proposed Project, this alternative would include

structural measures designed to convey stormwater flows through improvements to existing infrastructure such that runoff volumes do not exceed existing flows during peak storm events. Therefore, this alternative, in combination with other cumulative projects, would not result in a significant cumulative impact to people and/or property from a 100-year event. Similar to the proposed Project, this alternative would have a less than cumulatively considerable impact, and cumulative effects, therefore, would be less than significant.

Mitigation: None required.

Land Use and Planning

Impact 7A.10-1: Additional Housing Alternative A could conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant*)

As under the proposed Project, it is assumed that the additional increment of on-campus housing that would occur under Additional Housing Alternative A would be located within the Academic Growth Boundary and would not be constructed within the Campus Open Space land use designation (including the Arboretum Development District). It is further assumed under this alternative that no additional increment in on-campus housing under this alternative would be placed in the Campus Center, Lagunita, Lathrop, or San Juan Development Districts. The additional housing (2,342 units) that would be developed under this alternative would be located in the East Campus, Quarry, DAPER and Administrative, and/or West Campus Development Districts.

Based on the Stanford Community Plan Policy SCP-LU 3 that faculty/staff housing within the Academic Campus must be at least 15 units per acre, and consistent with its policies promoting compact urban development, it is reasonable to assume that additional faculty, staff, postdoctoral student and/or other worker housing that would occur under this alternative would be multi-family housing. Stanford indicates that densities for the additional multi-family housing that would be developed under this alternative would range from about 40 to 80 units per acre. The effects on the four development districts where additional housing is proposed under this alternative are described below.

East Campus Development District

Development in the East Campus Development District under this alternative includes 2,267 new housing units/beds (667 more units than the proposed Project, including an additional 460 faculty, staff, postdoctoral student and/or other worker units as well as 207 graduate student beds) and 20,000 square feet of academic and academic support space (same as the proposed Project). Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. Stanford indicates that placement of additional housing in this district would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Proposed additional housing development under this alternative would be consistent with the Academic Campus land use designation, provided any

potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

Quarry Development District

Development in the Quarry Development District under this alternative includes 1,100 new housing units (550 more faculty, staff, postdoctoral student and/or other worker units than under the proposed Project) and 200,000 square feet of academic and academic support space (same as the proposed Project). As noted above, Stanford anticipates that the housing density would be approximately 80 units per acre and building heights would be up to 135 feet in this district. In addition, this alternative is assumed to include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the Quarry Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. Proposed additional housing development under this alternative would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

DAPER and Administrative Development District

Development in the DAPER and Administrative Development District under this alternative includes the additional 666 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with up to 200,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands in the district that are located between Stanford Stadium and El Camino Real. Stanford indicated that placement of housing along El Camino Real could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. In addition, this alternative could include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the DAPER and Administrative Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. New housing proposed under this alternative would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

West Campus Development District

Development in the West Campus Development District under this alternative includes the additional 666 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with 35,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, with this alternative Stanford would not construct housing within the Campus Open Space designated

lands currently occupied by the Palo Alto Stock Farm Stable (Red Barn), and another narrow strip of land along Campus Drive near its intersection with Junipero Serra Boulevard. As with the DAPER and Administrative Development District, Stanford indicated that placement of housing along Sand Hill Road could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. New housing proposed under this alternative in this district would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

Summary

As under the proposed Project, housing development proposed by Additional Housing Alternative A would be consistent with the Growth and Development policies of the Stanford Community Plan by reducing potential environmental effects that could result from development of Stanford lands outside the Academic Growth Boundary. The additional housing proposed by this alternative would be consistent with the existing land use designations for Stanford lands described in the Stanford Community Plan. Similar to the proposed Project, at the time individual housing projects are proposed under this alternative, the County would require Stanford to apply for project-specific approvals; these projects may be subject to additional environmental review prior to consideration of approval by the County. Similar to the proposed Project, this alternative would have a less-than-significant impact regarding consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation: None required.

Cumulative Impacts

Impact 7A.10-2: Additional Housing Alternative A, in combination with past, present, and future projects could potentially contribute to cumulative land use impacts. (*Less than Significant*)

The geographic scope of potential cumulative land use impacts encompasses the Stanford lands within the General Use Permit boundary, Stanford lands adjacent to the boundary and not under County of Santa Clara jurisdiction, and adjacent, non-Stanford lands in other jurisdictions.

Lands that border the four development districts where additional housing would occur under Additional Housing Alternative A include Stanford lands within Palo Alto, such as the Stanford University Medical Center and Stanford Shopping Center, as well as non-Stanford lands within Palo Alto along El Camino Real and the College Terrace residential neighborhood. These areas are generally developed urban areas. Reasonably foreseeable growth within Palo Alto in areas adjacent to the development districts in which additional housing is proposed would represent intensification of existing land uses. Less than significant cumulative land use impacts would result from development under this alternative combining with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto that border those development districts.

Mitigation: None required.

Noise and Vibration

Construction Impacts

Impact 7A.11-1: Additional Housing Alternative A could expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction. (*Significant*)

Additional Housing Alternative A would involve more on-campus construction compared to the proposed Project due to the additional on-campus housing under this alternative. Thus, Additional Housing Alternative A would have the potential for greater construction noise effects than the proposed Project over the duration of the use permit. Construction activities would involve the same sources of noise as that would occur for the proposed Project. Consequently, as presented in **Table 7A.11-1**, the estimated construction noise for various phases of construction activity at distances of 50, 100, 150 and 300 feet from the construction site, would be the same as for the proposed Project.

TABLE 7A.11-1
NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT VARIOUS DISTANCES

Distance from Construction Site	Noise Levels in dBA (Hourly Leq)				
	Demolition	Site Preparation	Grading	Building Construction	Paving
50 feet	85.1	80.4	79.7	83.5	83.5
100 feet	79.1	74.4	73.7	77.5	77.5
150 feet	75.5	70.9	70.2	74.0	74.0
300 feet	69.5	64.9	64.2	68.0	67.9

SOURCE: Adapted from Bolt Baranek and Newman, 1971.

The Santa Clara County Ordinance Code establishes different construction noise limits for different land use areas. The most restrictive construction noise limit is 75 dBA for mobile equipment at single family residential areas, such as those off-site residences located across Stanford Avenue from the Project site. Although the County ordinance does not identify a construction noise limit for schools, it is reasonable to also apply this noise limit to nearby schools, day care facilities and other noise sensitive receptors. As can be seen from Table 7A.11-1, construction closer than 150 feet from off-site receptors would have the potential to result in noise levels in excess of the County's noise standard, which would be a significant impact under Additional Housing Alternative A, as under the proposed Project.

Similar to the proposed Project, during the life of Additional Housing Alternative A, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods to minimize potential noise and vibration disruption.

The County Ordinance Code establishes restrictions on the hours of noisy construction activity. The County Ordinance Code prohibits such activity on weekdays and Saturday between the hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, except for emergency work of public service utilities or by variance. As with the proposed Project, if construction activities under this alternative were to occur within these prohibited hours, this alternative would result in a significant impact, irrespective of whether a variance is granted. Implementation of **Mitigation Measure 7A.11-1**, the same mitigation proposed for the Project, would ensure that construction that occurs under Additional Housing Alternative A would be consistent with the County's noise ordinance. It is noted that the Palo Alto Municipal Code is slightly more restrictive, prohibiting such work between the hours of 6:00 p.m. and 8:00 a.m. Monday through Friday and between 6:00 p.m. and 9:00 a.m. on Saturday, or at any time on Sundays and holidays.

Mitigation Measure 7A.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* If construction would be within 150 feet of off-site sensitive receptors, Stanford shall employ noise attenuation measures to reduce the generation of construction noise to achieve a performance standard of 75 dBA at the affected property line of the nearest off-site single family residential receptor and 80 dBA at the affected property line of the nearest off-site multi-family residential receptor. These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards set forth in the County Ordinance Code.

Additional measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- For construction within the Project site that would be 150 feet of sensitive receptors located within the City of Palo Alto, hours of construction activity shall be restricted to those established in the City of Palo Alto Noise Ordinance (i.e., between the hours of eight a.m. to six p.m. Monday through Friday, and between nine a.m. and six p.m. on Saturday).

  For construction within the Project site that would be 150 feet of sensitive receptors located within all other residential areas, hours of construction activity shall be restricted to those established in the Santa Clara County Noise Ordinance (i.e., between seven a.m. and seven p.m., Monday through Saturday).

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 75 dBA;

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and

- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Emission of sound in the performance of emergency work is exempt from these requirements. In addition, variances to these restrictions may be allowed, with County approval, for certain utility work or other construction for which nighttime work would avoid secondary impacts (e.g., traffic impacts during commute periods); and where compliance with the noise thresholds is technically or economically infeasible. A variance may be granted only where the activity will not create a nuisance and will not be detrimental to the public health and safety.

Significance after Mitigation: Less than Significant.

Impact 7A.11-2: Additional Housing Alternative A construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity. (*Significant*)

Similar to the proposed Project, the potential exists for construction-related noise generated by Additional Housing Alternative A to be consistent with the standards established in the local general plan and noise ordinance assessed above in Impact 7A.11-1, and still result in a substantial temporary or periodic increase in ambient noise levels. Temporary increases in construction noise would potentially affect both on-site and off-site receptors.

Potential Construction-Related Noise Increases Impacts at Off-Site Receptors

This alternative would result in the additional housing development being located at the edges of the West Campus Development District (along Sand Hill Road), Quarry and DAPER and Administrative Development Districts (along El Camino Real), and/or East Campus Development District (along El Camino Real and Stanford Avenue). Consequently, this alternative could expose more off-site receptors to construction noise than the proposed Project. Similar to the proposed Project, off-site sensitive receptors near Stanford development districts designated for development under Additional Housing Alternative A include those along Stanford Avenue (e.g., Escondido Elementary School and residences in the College Terrace neighborhood), across El Camino Real (e.g., residences in the Southgate neighborhood) and residences along the northwest side of Sand Hill Road. As indicated in Table 5.11-1 in Section 5.11, Noise and Vibration, in the Draft EIR, existing daytime noise levels at these sensitive receptor locations range from 60 to 64 dBA. The nearest off-site sensitive receptors are located as close as 80 feet from the Project site boundary. As shown in Table 7A.11-1, construction noise levels could be as high as 80 dBA at 100 feet. As under the proposed Project, for construction under Additional Housing Alternative A that would occur at or near the Project site boundary, construction noise levels would be 15 to 20 dBA above existing ambient noise levels at off-site sensitive receptors and potentially higher at on-site receptors, which would be a significant impact. Implementation of **Mitigation Measure 7A.11-1** identified above, which implements a performance standard, will reduce this impact, where it is technically and economically feasible to do so. As under the proposed Project, individual projects that would occur under Additional Housing Alternative A would be subject to additional review through the

County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, and because it is unknown whether conditions justifying a variance might occur, it is possible that temporary or periodic increases in ambient noise in the vicinity of Additional Housing Alternative A would remain significant, even with implementation of noise reduction mitigation. Consequently, this impact is considered significant and unavoidable.

Potential Construction-Related Noise Increases Impacts at On-Site Receptors

Additional Housing Alternative A would result in more on-site construction than the proposed project, and would have a larger on-site residential population that could be exposed construction noise. As under the proposed Project, within the vicinity of the Project site under Additional Housing Alternative A, residential uses inclusive of on-site residential, day care or instructional classroom land uses would be considered noise sensitive to potential construction-related impacts of the proposed Project. These on-site receptors could be 50 feet or closer to construction activities that would occur under this alternative. Consequently, temporary construction-related noise increases to on-site receptors could be 15 dBA or greater, and thus would also be significant. As is done currently, and similar to the proposed Project, Stanford would manage and modify its instructional classroom activities under this alternative as needed to ensure temporary construction noise-related effects to instructional classroom land uses would be less than significant. Implementation of **Mitigation Measure 7A.11.2**, the same mitigation proposed for the Project, identifies a minimum construction noise performance standard for noise effects to on-site residential or day care land uses that will reduce construction noise impacts, where it is technically and economically feasible to do so. Similar to the proposed Project, it is expected that individual projects that would occur under Additional Housing Alternative A would be subject to additional review through the County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given that the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, it is possible that temporary or periodic increases in ambient noise in the Project site vicinity would remain significant, even with implementation of noise reduction mitigation. Consequently, similar to the proposed Project this impact under this alternative is considered significant and unavoidable.

> **Mitigation:** Implement Mitigation Measure 7A.11-1 noise impacts at off-site receptors.
>
> **Mitigation Measure 7A.11-2:** *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* For construction activities over two weeks in duration, and within 150 feet of on-site sensitive receptors, Stanford shall identify noise attenuation measures to reduce the generation of construction noise to achieve a minimum performance standard of 80 dBA, Leq over an 8-hour period at the nearest on-site residential or day care land use.[25] These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and

[25] Consistent with noise criteria used by FTA for construction activities in vicinity of residential land uses (FTA, 2006).

Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards.

If necessary to achieve the minimum performance standard stated above, measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 80 dBA;
- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and
- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.11-3: Additional Housing Alternative A construction could result in temporary exposure of persons to or generation of, excessive groundborne vibration or groundborne noise levels in the Project site vicinity. (*Significant*)

Additional Housing Alternative A would involve more on-campus construction compared to the proposed Project due to the additional on-campus housing under this alternative. Thus, Additional Housing Alternative A would have the potential for greater construction groundborne vibration and noise effects than the proposed Project over the duration of the use permit.

A variety of construction activities can propagate ground-borne vibration, demolition (e.g., use of hoe-rams for demolishing large concrete structures), grading activities (e.g., use of vibratory rollers for soil compaction) and pile installation for foundations. As with the proposed Project, under Additional Housing Alternative A, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place piles) to minimize potential noise and vibration disruption.

As discussed for the proposed Project, the vibration threshold for architectural damage to historic buildings and structures is 0.12 PPV (in/sec), the vibration threshold for damage to all other structures is 0.3 in/sec, and the vibration threshold for an adverse human reaction is 0.1 in/sec. Similar to the approach taken for the proposed Project, this impact analysis conservatively

assumes that construction under Additional Housing Alternative A could occur within the immediate vicinity of one or more of Stanford's historic structures.

Groundborne vibration from grading, excavation, and building construction could produce substantial temporary vibration levels at nearby sensitive receptors, as well as at nearby structures. The extent to which these receptors and structures would be affected by groundborne vibration depends largely on soil conditions, building design and materials, construction techniques employed, distance from the construction site to the receptor and structure, and the age and condition of the structure.

Typical reference vibration levels for various pieces of construction equipment are listed below in **Table 7A.11-2**.

TABLE 7A.11-2
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment/Activity	PPV at 25 ft (inches/second)[a]
Jackhammer	0.035
Loaded Trucks	0.076
Caisson Drilling (represents Auger Drilling Pile Installation)	0.089
Large Bulldozer	0.089
Hoe Ram	0.089
Vibratory Roller	0.210

SOURCE: FTA, 2006 (Table 12-2, p. 12-12).

As shown in Table 7A.11-2, the use of vibratory rollers would have the potential to create the greatest vibration levels during construction. Based on the vibration velocities in Table 7A11-2, vibratory rollers would have the potential to cause damage to historic buildings and structures to if it were to occur within an estimated 40 feet of those structures. This would also be the distance from residential land uses at which the adverse human reaction of 0.1 in/sec would start to be exceeded. Construction activities would have the potential to cause damage to modern structures at a distance of 20 feet.

Similar to the proposed Project, due to the proximity of historic structures within the Project site to construction activities that would occur under Additional Housing Alternative A, construction vibration levels could exceed building damage and adverse human reaction threshold, resulting in a significant impact. Implementation of **Mitigation Measure 7A.11-3**, the same mitigation as that identified for the proposed Project, would address this impact, and ensure it would be reduced to a less-than-significant level.

> **Mitigation Measure 7A.11-3:** *Construction Vibration Reduction Plan.* If construction involving vibratory rollers, hoe rams, or large bulldozers is proposed within 40 feet of an historic structure, Stanford shall develop a Vibration Reduction Plan in coordination with an acoustical consultant, geotechnical engineer, and/or construction contractor, for review and approval by the County Planning and Development Department. Measures and

controls shall be identified based on project-specific final design plans, and may include, but are not limited to, either or both of the following:

1. Use non-vibratory excavator-mounted compaction wheels and small smooth drum rollers for final compaction of asphalt base and asphalt concrete. If needed to meet compaction requirements, smaller vibratory rollers will be used to minimize vibration levels during repaving activities where needed to meet vibration standards.

2. Implementation of buffers and the use of specific types of equipment to minimize vibration impacts during construction at nearby receptors in order to meet a performance standard of 0.12 inches per second PPV at historic buildings and 0.3 inches per second PPV at non-historic buildings.

3. Implementation of a vibration, crack, and line and grade monitoring program for identified historic buildings located within 40 feet of construction activities, in coordination with a geotechnical engineer and qualified architectural historian.

Significance after Mitigation: Less than Significant.

Operational Impacts

Impact 7A.11-4: Additional Housing Alternative A could increase long-term noise levels in the Project vicinity to levels in excess of applicable noise standards. (*Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit and therefore, would have more on-site noise sources and more on-site noise-sensitive receptors than the proposed Project.

Similar to the proposed Project, new development under Additional Housing Alternative A would generate noise from heating, ventilating, and air conditioning mechanical equipment that would serve each building. Emergency backup generators, if required for new buildings, would be tested regularly and operated occasionally. Typically, the Bay Area Air Quality Management District (BAAQMD) permits emergency backup generators to operate for up to 50 hours per year, or on average about one hour per week.

While, as under the proposed Project, the specific location of new buildings (and associated building mechanical equipment) that would be developed, and the distance to the nearest sensitive receptors, is not known for this alternative at this time, development under Additional Housing Alternative A would occur on County lands and therefore would be required to comply with the noise restrictions of the Santa Clara County noise ordinance.

Future uses within the Project area could require loading docks. Noise levels of 80 dBA L_{max} and 60 dBA L_{eq} at a distance of 50 feet can be generated during loading dock activities (ESA, 2008).

Existing off-site sensitive receptors in the jurisdictions of Palo Alto and Menlo Park are located as close as 80 feet to the Project site. Consequently, as was assumed for the proposed Project, it is conservatively assumed that mechanical equipment operation and loading dock activity from new

development under Additional Housing Alternative A could increase noise levels at the nearest off-site sensitive receptor by more than the 6 dBA allowed by the City of Palo Alto Noise Ordinance and create a noticeable increase in ambient noise levels above baseline noise levels. Similar to the proposed Project, increased noise from building mechanical equipment under Additional Housing Alternative A is identified as a significant impact.

> **Mitigation Measure 7A.11-4:** *Shield or Enclose HVAC Equipment and Emergency Generators.* Noise levels from mechanical equipment within 150 feet of sensitive receptors shall be minimized by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment achieves the following noise standards at the property line of an offsite sensitive land uses in Palo Alto or Menlo Park, or at the nearest on-site residential, day care or instructional classroom land use:
>
> - The project shall not cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB;
> - The project shall not cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB;
> - The project shall not cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.
>
> Noise levels from the periodic testing of emergency generators within 150 feet of sensitive receptors in the cities of Palo Alto or Menlo Park also shall be minimized by proper siting and through installation of acoustical shielding. Scheduled testing of an emergency generator must not occur before 7:00 a.m. or after 7:00 p.m.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7A.11-5: Additional Housing Alternative A traffic would not substantially increase traffic noise levels in the vicinity of the Project site. (*Less than Significant*)

As under the proposed Project, additional traffic generated by Additional Housing Alternative A would increase noise levels on the roadway network. A traffic-related ambient noise increase of either 3 or 5 dBA or more would be considered a significant impact, depending the existing roadway noise levels, where sensitive receptors are located along the affected roadway segments. Traffic noise levels at intersections most affected by traffic from Additional Housing Alternative A were modeled using the FHWA Traffic Noise Prediction Model and the turning movements for 2018 Baseline and 2018 Baseline plus Project conditions from the transportation analysis.

The roadway segments analyzed and results of the modeling are shown in **Table 7A.11-3**. As shown in Table 7A.11-3, under the 2018 Baseline plus Additional Housing Alternative A scenario, traffic noise would increase between 0.1 and 0.7 dBA (less than the minimum 3 dBA threshold), depending on roadway study segment. Therefore, development under Additional

Housing Alternative A would result in a less than significant operational traffic noise impact. This is a similar conclusion that was reached for the proposed Project, where traffic noise would increase between 0.1 and 0.5 dBA, and also less than the minimum 3 dBA threshold.

TABLE 7A.11-3
TRAFFIC ROADSIDE NOISE LEVELS IN THE PROJECT SITE VICINITY

Roadway Segment	Baseline (2018) (A)	Baseline Plus Additional Housing Alternative A (2018) (B)	Difference between Additional Housing Alternative A and Baseline (B-A)	Cumulative No Project (2035) (C)	Cumulative Plus Additional Housing Alternative A (2035) (D)	Difference between Cumulative Plus Additional Housing Alternative A 2018 Baseline (D-A)	Difference between Cumulative Plus Additional Housing Alternative A and Cumulative No Additional Housing Alternative A (D-C)
Sand Hill Road							
between Stock Farm Road and Pasteur Drive	70.3	70.6	0.3	70.6	70.9	0.6	0.3
between Santa Cruz Avenue and Stock Farm Road	70.9	71.2	0.3	70.9	71.2	0.3	0.3
between Saga Lane and Sharon Park Drive	70.9	71.1	0.2	70.7	71.0	0.2	0.4
El Camino Real							
between Churchill Avenue and Serra Street	71.2	71.7	0.5	72.4	72.7	1.5	0.3
Junipero Serra Boulevard							
between Campus Drive and Stanford Avenue	68.1	68.6	0.5	68.7	69.1	1.0	0.4
between Stanford Avenue and Page Mill Road	68.7	69.4	0.7	69.4	70.0	1.3	0.6
Foothill Expressway							
between Arastadero Road and Edith Avenue	72.3	72.4	0.1	74.2	74.3	2.0	0.1
Alpine Road							
between I-280 and Junipero Serra Boulevard	69.8	70.1	0.3	70.2	70.5	0.7	0.3
Oregon Expressway							
between El Camino Real and Middlefield Road	71.3	71.4	0.1	71.9	72.0	0.7	0.1
Embarcadero Road							
between Town & Country and Middlefield Road	65.9	66.2	0.3	67.1	67.3	1.4	0.2
Stanford Avenue							
between Bowdoin Avenue and El Camino Real	61.3	62.0	0.7	61.6	62.3	1.0	0.7

NOTES:

Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

Source: FHWA, 2006 and ESA, 2018

Mitigation: None required.

Cumulative Impacts

Impact 7A.11-6: Additional Housing Alternative A construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to cumulative noise impacts. (*Significant*)

Similar to the proposed Project, development under Additional Housing Alternative A may be constructed during the same time and duration as cumulative projects in the area, and could result in a contribution to construction noise levels. The geographic study area for cumulative construction impacts is defined as a 500-foot radius around the Project site.

The most notable off-site cumulative project that would generate construction noise within this screening distance would be the final stages of construction for the SUMC Renewal Project. Construction noise impacts associated with the SUMC Renewal Project were identified as significant and unavoidable at both the project-level and cumulative scenario in the *Stanford University Medical Center Facilities Renewal and Replacement Draft EIR*. The great majority of construction associated with the SUMC Renewal Project would be completed prior to commencement of construction under Additional Housing Alternative A. However, the SUMC Renewal Project's replacement buildings for the School of Medicine and some of that project's hospital/clinic square footage would be constructed during implementation of Additional Housing Alternative A and, consequently, similar to the proposed Project, could overlap with construction Additional Housing Alternative A. This could include housing construction that would occur within the Quarry and West Campus Development District under this alternative.

Similar to the proposed Project, given that construction noise from development under Additional Housing Alternative A would be significant, as described under Impacts 7A.11-1 and 7A.11-2, and that construction noise from the SUMC Renewal Project would be significant, there could be a significant cumulative construction noise impact. Consequently, as with the proposed Project, mitigation measures are identified to limit the cumulative contribution of noise from construction under Additional Housing Alternative A. Additional Housing Alternative A contribution to cumulative construction noise impacts would be reduced with mitigation, but not to a level that is less than significant for the reasons provided in the discussion of Impact 7A.11-2. This is the same finding as under the proposed Project.

> **Mitigation:** Implement Mitigation Measure 7A.11-1, *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors,* and Mitigation Measure 7A.11-2, *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*
>
> **Significance after Mitigation:** Significant and Unavoidable.

Impact 7A.11-7: Additional Housing Alternative A traffic in combination with traffic from cumulative development would not contribute considerably to cumulative noise impacts. (*Less than Significant*)

Long-term noise from cumulative development would primarily occur from motor vehicle traffic. When considered alone, development under Additional Housing Alternative A would generate

noise mainly by adding more traffic to area roads and streets. Other anticipated projects would also contribute increased traffic volumes that would generate noise in the area. Any project that would individually have a significant project level noise impact would also be considered to have a significant cumulative noise impact.

A permanent noise increase of 3 dBA or 5 dBA or more in ambient noise levels in the vicinity above levels existing without Additional Housing Alternative A would be considered to generate a significant impact. Traffic noise levels at intersections most affected by traffic from buildout of Additional Housing Alternative A were modeled using the FHWA Traffic Noise Prediction Model and the turning movements for the existing conditions, Cumulative No Project (2035) and Cumulative plus Additional Housing Alternative A (2035) conditions. The segments analyzed and the results of the noise modeling are shown in Table 7A.11-3.

As shown in Table 7A.11-3, the increase in traffic noise between the Baseline (2018) and Cumulative Plus Project (2035) scenario would be no more than 2.0 dBA (less than the minimum 3 dBA threshold) at all analyzed roadway segments. Therefore, the cumulative traffic noise impact under Additional Housing Alternative A would be less than significant. This is the same finding as for the proposed Project.

Mitigation: None required.

Population and Housing[26]

Impact 7A.12-1: Additional Housing Alternative A would not directly induce substantial population growth by proposing new homes or businesses, and indirectly through the extension of infrastructure. (*Less than Significant*)

As noted in the proposed Project impact analysis, population and housing changes, in and of themselves, are not normally considered to be significant impacts (i.e., substantial, adverse impacts on the physical environment) under CEQA, but CEQA does allow inclusion of these effects as indicators of other impacts. More specifically, CEQA Guidelines section 15131 provides that social and economic effects may be considered to the extent that (1) they provide a linked connection between the proposed project and a physical environmental effect, or (2) they are useful in determining the significance of a physical environmental effect. The potential physical environmental impacts associated with changes in population and housing due to Additional Housing Alternative A are analyzed in other sections of this chapter (e.g., transportation, public services, air quality).

[26] The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives population and housing analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-PHD included in this document.

As shown in **Table 7A.12-1**, Additional Housing Alternative A would result in the same projected total/daily population growth as that which would occur under the proposed 2018 General Use Permit.

TABLE 7A.12-1
ANTICIPATED POPULATION GROWTH IN ALL POPULATION SEGMENTS UNDER ADDITIONAL HOUSING ALTERNATIVE A

Affiliation	2018 Population	2035 Population under Additional Housing Alternative A	Change in Population between 2018 and 2035
Undergraduate Students	7,085	8,785	1,700
Graduate Students, including PhDs	9,528	10,728	1,200
Postdoctoral Students[a]	2,403	3,364	961
Faculty[b]	3,073	3,862	789
On-Campus Staff [c]	8,985	11,423	2,438
Nonmatriculated Students[d]	977	1,397	420
Other Workers (total / daily based on commute frequency)[e]	9,166 / 5,321	11,267 / 6,395	2,101 / 1,074
Total / Daily	**41,217 / 37,372**	**50,827 / 45,955**	**9,610 / 8,583**

NOTES:
[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.
[e] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with Stanford Office of Institutional Research and Decision Support

However, since this alternative would provide additional on campus housing to accommodate the net increase in off-campus population that would occur under the proposed Project, the anticipated population that would reside on the Project site under this alternative would be greater than under the proposed Project.

The anticipated population that would reside on the Project site in 2035 is shown in Table 7A-3 in the Additional Housing Alternative A description. The increase in on-campus residential population associated with new housing that would be authorized under the proposed 2018 General Use Permit (6,326) combined with the increase in on-campus residential population associated with the additional on-campus housing proposed under this alternative (6,247), would result in a total increase in on-campus residential population of 12,573. The total on-campus residential population in 2035 under this alternative would be 27,911 compared to 21,664 under the proposed Project.

Additional Housing Alternative A assumes that Stanford would provide housing equal to the increased housing demand generated by the proposed 2018 General Use Permit and that the additional demand would be met by constructing additional on-campus housing. Therefore, in

addition to the proposed on-campus housing that would be provided under the proposed 2018 General Use Permit (3,150 units/beds), this alternative would also provide an additional 2,549 units/beds of on-campus housing, equivalent to the net increase in off-campus housing demand that would occur under the proposed Project. Thus, Additional Housing Alternative A includes the provision of a total of 5,699 new on-campus housing units/beds.

Unlike the proposed 2018 General Use Permit, the growth of Stanford-affiliated populations under Additional Housing Alternative A would not result in the construction of housing in other Bay Area communities beyond the Project site. Therefore, the potential negative effects of such growth associated with typical residential development projects would not occur in off-campus locations under this alternative. (Please note that, as described under Additional Housing Alternative A Description, Stanford could elect to, subject to approval by the County, to offset some or all of the incremental off-campus housing demand by providing off-campus housing; the potential environmental consequences of that option are addressed in Impact 7A.17-1, below.)

Similar to the proposed Project, this alternative would accommodate construction of campus infrastructure improvements to support proposed growth, including, but not limited to, utilities and circulation improvements such as pathways, underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, and other similar types of improvements. Although most infrastructure would be constructed on vacant land, infill sites, and redevelopment sites within the Academic Growth Boundary, some improvements could occur outside the Academic Growth Boundary. Similar to the proposed Project, development under Additional Housing Alternative A would include infrastructure improvements designed to accommodate Stanford's growth through 2035.

Based on the above analysis, similar to the proposed Project, Additional Housing Alternative A would not directly induce substantial population growth by proposing new homes or businesses, or indirectly through the extension of infrastructure, and the impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7A.12-2: Additional Housing Alternative A, in combination with past, present, and future projects would not result in substantial adverse cumulative population and housing impacts. (*Less than Significant*)

The geographic scope of potential population and housing impacts encompasses the Stanford lands within the proposed 2018 General Use Permit boundary as well as Bay Area communities that could be affected by population growth resulting from the Project.

Under this alternative, the total estimated direct increase in residential population within the Project site between 2018 and 2035 would be 12,573 people in 2035. This alternative would avoid typical environmental impacts associated with the proposed Project's off-site housing development. As this population would be housed entirely within the Project site, the increase in

population would not combine with non-Stanford population growth in Santa Clara County or other Bay Area communities and contribute to the Bay Area's cumulative housing impact. The impact would therefore be less than significant.

Mitigation: None required.

Public Services[27]

Construction Impacts

Impact 7A.13-1: Additional Housing Alternative A could increase demand for fire protection, emergency medical service and police protection services but would not result in an adverse physical impact from the construction of additional fire protection, emergency medical, or police protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. As a result, this alternative could result in additional demand for public services during construction. Similar to construction under the proposed 2018 General Use Permit, construction of individual projects under this alternative would result in temporary increases in vehicle congestion, delays and potential conflicts in the construction site vicinities and/or along construction haul routes; as well as the potential for construction worker accidents and medical emergencies at the construction sites, potentially requiring associated temporary increases in responses from public fire protection, EMS and/or police protection services to these incidents.

As under the proposed Project, all construction activities that would occur at construction sites under this alternative would be required to be conducted in compliance with applicable regulations, including Cal/OSHA standards and practices for worker safety, minimizing the need for public fire protection and emergency service response to worker accidents at construction sites. In addition, similar to mitigation identified for the proposed Project, Mitigation Measure 7A.15-1 under Transportation and Traffic, below, would ensure appropriate construction traffic control measures would be implemented for individual construction projects under this alternative to minimize on- and off-site construction traffic effects, and further minimizing potential construction traffic incidents requiring public fire, EMS and police response. As under the proposed Project, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s) and for communication and emergency dispatch services from the PAPD.

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27 The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives student generation analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-SCH included in this document.

While construction would periodically occur over the duration of this alternative, construction activities in and of themselves would not generate a significant additional demand for public fire protection, EMS and/or police services that would require new or physically altered facilities. Therefore, similar to the proposed Project, Additional Housing Alternative A would generate a less-than-significant construction impact related to fire protection, EMS and police protection services. See also Impacts 7A.13-2 and 7A.13-3, below.

Mitigation: None required.

Operational Impacts

Impact 7A.13-2: Operation of uses under Additional Housing Alternative A would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Additional Housing Alternative A would increase housing development on the Project site, and associated residential population, above that proposed by the 2018 General Use Permit, and thus, would increase demand for public fire protection and EMS services beyond that generated by the Project. As under the proposed Project, the increase in development and population under this alternative would occur within existing urbanized areas of the campus, and consequently, would be served by the existing on-campus Fire Station 6. As discussed in Section 5.13 of the Draft EIR, Stanford DPS is relocating to the planned Public Safety Building and Departmental Operations Center in Stanford's Bonair Corporation Yard, which will in turn serve to provide additional operational space for PAFD or another provider at Fire Station 6 to use, if needed.

Similar to the proposed Project, this alternative would allow for authorization of expanded or new academic support development, which could include additional on-campus fire protection/EMS facilities, if needed to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under this alternative are addressed throughout the analysis for other environmental topics presented for this alternative.

As with the proposed Project, under this alternative, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s). The City of Palo Alto and Stanford are currently under a five-year contract for PAFD to provide fire protection and EMS services to Stanford.

Similar to the proposed Project, new development that would occur on the Project site under this alternative would require fire and life safety code compliance, provided by the Stanford University Fire Marshal's Office (SUFMO). As under the proposed Project, as new individual developments are proposed under this alternative, the SUFMO would review building plans to ensure the project provides for adequate compliance with fire code requirements.

Given these factors, increases in development on the Project site, and increase in residential and commuter population under this alternative would increase demand for fire protection and emergency medical services, however, would not result in an adverse physical impact from the construction of additional fire protection or emergency medical service facilities. Therefore, similar to the proposed Project, operation of this alternative would generate a less-than-significant impact related to fire protection and EMS services.

Mitigation: None required.

Impact 7A.13-3: Operation of development under the Additional Housing Alternative would increase demand for police protection services. (*Less than Significant*)

Additional Housing Alternative A would increase housing development on the Project site, and associated residential population, above that proposed by the 2018 General Use Permit, and thus, would increase demand for police protection services beyond that generated by the Project. As discussed in Section 5.13 in the Draft EIR, the Stanford DPS will be relocating on-campus to the planned Public Safety Building and Departmental Operations Center. As under the proposed Project, this facility would provide adequate space for Stanford DPS to operate throughout the life of this alternative.

Similar to the proposed Project, this alternative would also allow for new and/or expanded academic support development, which could include additional Stanford DPS facilities, if needed, to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under this alternative are addressed throughout the analysis for other environmental topics presented for this alternative.

As with the proposed Project, under this alternative, Stanford would pay the City of Palo Alto a fair share contribution annually as compensation for the communication and emergency dispatch services it would receive from the PAPD.

As discussed in Section 5.13 in the Draft EIR, the City of Palo Alto is also planning a new Public Services Building (expected to be operational in 2021) that would house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City.

Given these factors, increases in development on the Project site and increase in resident and commuter population under this alternative would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional police protection facilities. Therefore, similar to the proposed Project, operation of this alternative would generate a less-than-significant impact to police protection services.

Mitigation: None required.

Impact 7A.13-4: Additional Housing Alternative A would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

Additional Housing Alternative A would increase residential development and the associated residential population on the campus compared to the proposed 2018 General Use Permit. Therefore, this alternative would increase on-campus school-aged children that would be served by PAUSD over that which would be generated by the proposed Project.

This analysis uses student generation rates based on children per household to estimate the number of school-age children that would be generated as a result of increased campus population under this alternative. Similar to the proposed Project, rates of 0.23 for elementary school, 0.12 for middle school, and 0.15 for high school were used for this alternative, for a total student generation rate of 0.50. These student generation rates used are consistent with the moderate student generation rates used by PAUSD's demographer, DecisionInsite, in its Fall 2016 Residential Research Summary Report.[28] The additional on-campus housing that would be developed under this alternative would be multi-family units, similar to that analyzed for the proposed Project; and consequently, the multi-family student generation rates would remain applicable.[29]

Table 7A.13-1 summarizes the estimated enrollment in PAUSD schools from students generated under this alternative. Under this alternative, 2,892 new faculty/staff housing units (an increase of 2,342 units over the proposed Project) would be constructed on-campus that could be occupied by faculty and staff, including postdoctoral students and medical residents, and/or other workers. Application of the student generation ratios to the 2,892 new units results in an estimated increase of 1,446 additional school-age children (1,171 more school-age children than the proposed Project). As shown in Table 7A.13-1, similar to the proposed Project, the addition of school-age students to the PAUSD would be diffused over various grade levels and schools. As under the proposed Project, since buildout of this alternative, including new residential units, would occur incrementally over an approximate 17-year span, the school-age students generated by this alternative that would be added to PAUSD schools would also occur incrementally over this span.

As described in the Draft EIR Section 5.13, currently PAUSD middle school enrollment exceeds PAUSD middle school capacity, whereas PAUSD elementary and high school enrollment are within PAUSD capacity. However, the PAUSD projected a decline in both its elementary and middle school student enrollment through its planning horizon of 2026/27. In addition, while PAUSD projected a near-term increase in its high school enrollment until 2020, it projected a decline in its high school enrollment thereafter through 2026/27. More recent PAUSD enrollment projections through school year 2022/23 indicate similar near-term enrollment trends, with the exception of PAUSD elementary school enrollment, which under the moderate projection may

[28] These rates are also consistent with the rates considered in the Comprehensive Plan Update Final EIR for the City of Palo Alto (City of Palo Alto, 2017b).

[29] It should be noted that PAUSD has since completed a Winter 2018 Residential Research Summary Report that presents higher multi-family student generation rate for the moderate scenario (0.66) than from its prior report (PAUSD, 2018a). However, data provided by Stanford of its existing faculty/staff multi-family housing on and near the campus yields a student generation rate of no more than 0.38. Consequently, the continued use of a total student yield rate of 0.5 students/unit for the Project and housing alternatives is considered conservative.

experience up to a six percent increase over the next five years (PAUSD, 2018b). The overall long-term projected decline in PAUSD enrollment could serve to lessen the effect of Project-generated school-age children that would attend PAUSD schools on student capacity.

TABLE 7A.13-1
ESTIMATED PAUSD ENROLLMENT FROM STANFORD 2018 GENERAL USE PERMIT FOR ADDITIONAL HOUSING ALTERNATIVE A

Schools	Increase in Number of Units	Student Generation Rates[a]	Estimated Number of Students
Elementary	2,892	0.23	665
Middle School	2,892	0.12	347
High School	2,892	0.15	434
Total		**0.50**	**1,446**

NOTES:
[a] Student generation rates from PAUSD, *Residential Research Summary,* Fall 2016 prepared by DecisionInsite, November 2016.

Consistent with the analysis for the proposed Project in Section 5.13 of the Draft EIR, if conservatively assuming that all of the students generated under Additional Housing Alternative A would be added to the PAUSD schools prior to PAUSD's planning horizon of 2026/27, when considering the existing student capacities of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27 planning horizon, similar to the proposed Project there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated students added by this alternative in 2026/27.

On the other hand, if considering an even more conservative scenario that the entire increase in students generated under Additional Housing Alternative A would be added to the PAUSD schools prior to its current shorter planning horizon of 2022/23, and using the more recent PAUSD enrollment projections which show higher near-term enrollment, this alternative would result in exceedances in capacity of PAUSD elementary, middle and high schools. However, these results are unlikely because as discussed above, in actuality, the development of new on-campus residential units under this alternative, and thus, the increase in school-age students generated by this alternative that would be added to PAUSD schools, would not all be concentrated within the first five years of the general use permit, but rather, would occur incrementally over an approximate 17-year span between 2018 and 2035.

In any case, even if school enrollment were to increase such that more school capacity is needed, PAUSD would have multiple options to explore before building a new school. In addition to reactivating existing school sites owned by PAUSD, such as Cubberley, Greendell and Garfield, the PAUSD also has several school properties currently leased to private school providers, such as Athena Academy, and Pinewood School. PAUSD also maintains an agreement with the City of Palo Alto that allows PAUSD the right to repurchase the Ventura site for educational purposes. PAUSD could also take advantage of schools that may be operating below capacity by redrawing lines designating which neighborhoods attend a given school or by adding modular classrooms. Given these circumstances, construction of a new school appears to be speculative even with the

increases in student generation that could occur under this alternative. In the event any PAUSD school expansion occurs, PAUSD would be required to undergo site-specific environmental review, as appropriate, prior to consideration of approval by the PAUSD.

Pursuant to California Government Code Sections 65995.5 through 65997, and related impact fees established by the PAUSD, school impact fees are charged for new residential and commercial development that would be developed by Stanford under this alternative. Pursuant to Government Code section 65997, payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with this alternative.

When considering all the above factors, while Additional Housing Alternative A would increase enrollment in local public schools, this alternative would not result in adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards.

Mitigation: None required.

Cumulative Impacts

Impact 7A.13-5: Implementation of Additional Housing Alternative A in combination with past, present, and reasonably foreseeable projects, would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

This section analyzes potential impacts to fire protection services that could occur from this alternative in combination with reasonably foreseeable growth in the PAFD service area. As discussed in the Environmental Setting, the PAFD service area includes the jurisdictional boundaries of Palo Alto in addition to some of the unincorporated land surrounding the city limits, including the Project site.

As discussed in Impacts 7A.13-1 and 7A.13-2, above, the alternative's impact to PAFD's fire protection and EMS services is determined to be less than significant. Sufficient fire protection facilities would exist on campus to the serve additional development and population under this alternative. Furthermore, under this alternative, Stanford would pay the City of Palo Alto a fair share contribution annually for fire protection services from the PAFD.

The City of Palo City is implementing a number of improvements to PAFD fire station facilities in its City, including improvements to Fire Station 1 by 2019, replacement of Fire Station 3 by 2019, and a planned replacement of Fire Station 4 by 2020. As discussed for the Project, PAFD indicates with these planned improvements, the PAFD can adequately serve the increased demand from increased growth and buildout of the City. Annual City reviews and monitoring of fire department services and performance metrics (including response times) that is conducted by the City would help to ensure that the PAFD would continue to adequately meet the demands of the city and accommodate growth not only by this alternative but from throughout the city.

Therefore, the cumulative impact under this alternative would be less than significant.

Mitigation: None required.

Impact 7A.13-6: Development of Additional Housing Alternative A in combination with past, present, and reasonably foreseeable projects would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Cumulative impacts are considered in the context of the growth and development under the alternative as they are within the service area of Stanford DPS, as well as that of the PAPD and the Santa Clara County Sheriff's Department.

As discussed in Impacts 7A.13-1 and 7A.13-3, above, the alternative's impact on police protection services, including Stanford DPS, PAPD and the Santa Clara County Sheriff's Department, is determined to be less than significant. Stanford DPS is relocating on-campus to its planned Public Safety Building and Departmental Operations Center which will provide adequate space for Stanford DPS to operate under this alternative. In addition, the City of Palo Alto planned new PSB will house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City. Additionally, annual City reviews and monitoring of law enforcement services and performance metrics (including dispatch response times) that is conducted by the City of Palo Alto would help to ensure that the PAPD would continue to adequately meet the demands of the city and are able to accommodate growth not only by this alternative but from throughout the city.

Therefore, implementation of this alternative in combination with past, present, and reasonably foreseeable projects would have a less-than-significant cumulative effect with respect to police protection services.

Mitigation: None required.

Impact 7A.13-7: Development of Additional Housing Alternative A in combination with past, present, and reasonably foreseeable projects would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

This section analyzes potential impacts related to schools that could occur from implementation of this alternative in combination with reasonably foreseeable growth in PAUSD's service area. Cumulative development within the PAUSD service area would generate new students to PAUSD, which could result in the need for new or expanded school facilities.

As discussed in Impact 7A.13-4, above, when conservatively considering the existing student capacity of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27 planning horizon, there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated added students generated by this alternative in 2026/27. Impact 7A.13-4 also acknowledges that in an even more conservative scenario that the entire increase in students generated under Additional Housing Alternative A would be added to the PAUSD schools prior to its current shorter planning horizon of 2022/23, this alternative would result in exceedances in capacity of PAUSD schools; although, these results are unlikely given that new on-campus residential uses under alternative would be developed incrementally over an approximate 17-year span under the new general use permit. Nonetheless, Impact 7A.13-4 describes multiple options available to PAUSD to explore to increase school capacity if needed. Impact 7A.13-4 also discusses that Stanford's payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with the proposed alternative.

The City of Palo Alto recently completed environmental review for, and adopted an update to, its Comprehensive Plan, which considered a range of future growth scenarios. The selection of the preferred scenario by the City would result in 3,545 to 4,420 new housing units in the City that could generate between 1,773 and 3,632 new students. The Final EIR for the update to the Comprehensive Plan determined that this range of anticipated student growth would result in an exceedance of existing PAUSD capacity for its elementary, middle and high schools. The PAUSD is responsible for updating it enrollment forecasts as needed, including any increases that would be associated with growth under the City's Comprehensive Plan. However, the additional student growth under Additional Housing Alternative A combined with the cumulative growth anticipated under the Comprehensive Plan would result in a cumulative increase to enrollment of public schools within the PAUSD service area. As with the Additional Housing Alternative A, all other cumulative projects within the PAUSD service area would also be subject to the school development fees.

It is unknown where or how school facilities would be expanded to accommodate future students. It would therefore be speculative to analyze the impacts of potential future school construction projects in this EIR. As noted above under Impact 7.A.13-4, even if school enrollment were to increase such that more school capacity is needed, PAUSD would have multiple options to explore before building a new school. In addition to reactivating existing school sites owned by PAUSD, such as Cubberley, Greendell and Garfield, the PAUSD also has several school properties currently leased to private school providers, such as Athena Academy, and Pinewood School. PAUSD also maintains an agreement with the City of Palo Alto that allows PAUSD the right to repurchase the Ventura site for educational purposes. PAUSD could also take advantage of schools that may be operating below capacity by redrawing lines designating which neighborhoods attend a given school, or by adding modular classrooms and/or developing two-story facilities. The PAUSD is currently preparing its 2018 Facilities Master Plan. As part of the development of the plan, the PAUSD is in the process of defining districtwide standards, and considering infrastructure needs at each of its school sites. The PAUSD Board is considering placing a bond measure on the November 2018, March 2020, or November 2020 ballot to provide funding for the next 20 years of PAUSD facilities improvements. Given these circumstances, construction of a new school appears to be speculative even with the increases in student generation that could occur under this alternative. Further, if it is determined that additional

school facilities are needed as growth occurs, expansion and/or construction would be subject to separate environmental review, thereby providing an opportunity to identify and mitigate associated environmental impacts.

Therefore, Additional Housing Alternative A's contribution to cumulative impacts related to school facilities would be less than significant.

Mitigation: None required.

Recreation[30]

Approach to Analysis

On-Campus Impacts

Consistent with the analysis prepared for the proposed Project, this alternative analysis also considers the number of all on-campus residents anticipated under Additional Housing Alternative A compared to the total acreage of designated Campus Open Space lands to determine whether there would be at least five acres of designated Campus Open Space per 1,000 campus residents.[31]

Off-Campus Impacts

Similar to the approach used to consider off-campus impacts to parks and recreation facilities for the proposed Project, the analysis of Additional Housing Alternative A considers the neighboring public park and recreation facilities used by Stanford's residential population and the potential that an increase in use of off-site facilities under this alternative could contribute to substantial deterioration of those facilities.

Consistent with the approach used to analyze the proposed Project, a combined daily visit generation rate is used for faculty, staff and postdoctoral students to estimate the potential increase in visits to public park and recreation facilities identified in Palo Alto and Menlo Park. This data relies on visit generation rates calculated from a campus-wide survey conducted in 2016. Where other workers are included in the on-campus resident population under this alternative, their household size and park usage behavior are assumed to be the same as that of faculty, staff and postdoctoral students. Similar to that assumed for the proposed Project, this analysis also assumes that spouses and dependents would have the same behavior as the primary affiliate.

Similar to the analysis of the proposed Project, Stanford also conducted a sensitivity analysis that conservatively considered the additive effect of any incidental use of nearby parks and recreation facilities associated with an increase in Stanford commuters that would occur under the alternative.

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30 The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives park and recreation facilities analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-REC included in this document.

31 Campus residents include all residents on Stanford lands within the General Use Permit boundary, including students, faculty, staff, postdoctoral students, and other workers. The resident population estimates also include the spouses and children of the population living on the campus.

Using the same screening criteria as that used for the proposed Project, if growth in on-campus residents under this alternative is found to result in more than 12.5 daily visits per acre at a particular public park or recreation facility, additional site specific analysis would be performed to determine whether the increase in visitors might require replacement of turf or other recreation facilities substantially in advance of their expected life cycles. Alternately, an increase of less than 12.5 daily visits per acre at a particular park or recreation facility would indicate that substantial deterioration from increased use by campus residents would be highly unlikely, and no additional analysis would be necessary.

Construction and Operational Impacts

Impact 7A.14-1: Additional Housing Alternative A would increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Significant*)

Additional Housing Alternative A would result in a greater on-campus residential population compared to the proposed Project, and consequently, would create a greater demand for, and use of, on- and off-campus park and recreational facilities than the proposed Project.

On-Campus Park and Recreational Facility Deterioration

It is assumed that under this alternative, the location and amount of land designated as Campus Open Space in the Stanford Community Plan on the Project site would not change from baseline conditions. **Table 7A.14-1**, below, demonstrates that, with an estimated ratio of 9.5 acres of designated Campus Open Space per 1,000 campus residents, the lands designated Campus Open Space on the Project site would provide adequate space to support the estimated campus residents under this alternative. The ratio provided under this alternative would be less than that provided under the proposed Project (12.2 acres of designated Campus Open Space per 1,000 campus residents), however would still be well more than the minimum of five acres of designated Campus Open Space per 1,000 campus residents. Similar to the conclusion reached for the proposed Project, based on the availability of Campus Open Space, the increased residents under this alternative would not result in overuse that could lead to substantial degradation of parks and recreation facilities and would not create a need for construction of new onsite park, recreation and open space facilities.

TABLE 7A.14-1
STANFORD CAMPUS OPEN SPACE ACREAGE PER RESIDENT - ADDITIONAL HOUSING ALTERNATIVE A

	Fall 2018	Fall 2035 (with buildout of Additional Housing Alternative A)
Campus resident population	15,338	27,911
Designated Campus Open Space (approximate)	265	265
Ratio (acres per 1,000 residents, approximate)	17.3	9.5

SOURCE: Stanford, 2018 (see Appendix ALT-REC)

Off-Campus Park and Recreational Facility Deterioration

Table 7A.14-2 presents the estimated increase in usage in public park and recreation facilities in Palo Alto and Menlo Park by campus residents under Additional Housing Alternative A.

TABLE 7A.14-2
ESTIMATED INCREASE IN USAGE IN PUBLIC PARK AND RECREATION FACILITIES BY ON-CAMPUS RESIDENTS UNDER ADDITIONAL HOUSING ALTERNATIVE A

Figure[a] Reference	Name	Acres[b]	Growth in Daily Visits	Daily[c] Visits per Acre
PALO ALTO				
Regional/District Parks				
1	Foothills Park/Open Space Preserve	Total 1,400; Active 26.7	173	0.1; 6.5
2	Baylands Nature Preserve	Total 1,940; Active 9.2	140	0.1; 15.2
3	Pearson-Arastradero Preserve	Total 622; Active 6.2	107	0.2; 17.3
Neighborhood Parks and Recreation Facilities				
4	Neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks)	4.4	164	37.3
5	Mayfield (Stanford-Palo Alto) playing fields	5.9	64	10.8
6	El Camino Park	12.2	59	4.8
7	Baylands Athletic Center fields	10.0	26	2.6
8	Heritage Park	2.01	26	12.9
9	Rinconada Pool	NA	16	NA
10	Mitchell Park	21.4	13	0.6
11	Peers Park	4.7	25	5.3
12	Lawn Bowling Green	1.9	3	1.6
13	Avenidas Senior Center	NA	5	NA
14	Cubberley Community Center	NA	19	NA
MENLO PARK				
Regional/District Parks				
15	Bedwell Bayfront Park	Total 160; Active 7.0	2	0.0; 0.3
Neighborhood Park and Recreation Facilities				
16	Civic Center recreation facilities	9.3	52	5.6
17	Stanford Hills Park	3.1	44	14.2
18	Sharon Park	9.8	11	1.1
19	Sharon Hills Park	11.5	11	1.0
20	Nealon Park	9.0	7	0.8
21	Jack W. Lyle Park	4.6	6	1.3

NOTES:
[a] Figure references are associated with recreation facilities shown on Figure 5.14-2 in the Draft EIR.
[b] Acreages of all parks were obtained from Palo Alto or Menlo Park City websites and documents, except for Sharon Hills Park, which was calculated by Stanford. Please see Appendix REC in the Draft EIR for calculations on "actively used" park areas for regional/district parks.
[c] Resulting daily visits per acre is calculated based on the total of growth in daily visits under the housing alternative, which includes the growth in campus residents under the proposed Project plus the additional growth assumed for Additional Housing Alternative A.

SOURCE: Stanford, 2018 (see Appendix ALT-REC)

As shown in Table 7A.14-2, the increase in on-campus residents anticipated to occur under Additional Housing Alternative A would cause five parks to experience an increase of visits over the screening threshold of 12.5 daily visits per acre:[32]

- Two regional/district parks: Baylands Nature Reserve and Pearson-Arastradero Preserve in Palo Alto, and,
- Three neighborhood parks: College Terrace parks and Heritage Park in Palo Alto; and Stanford Hills Park in Menlo Park.

In comparison, under the proposed Project, no public parks would experience an increase over the screening threshold.

Following the approach to analysis described above, the next step was to consider whether the increase in visitors (exceeding 12.5 per acre per day) might require replacement of turf or other recreation facilities substantially in advance of their expected life cycles.

There are no turf areas at the Pearson-Arastradero Preserve and Baylands Nature Preserve in Palo Alto. The calculation of active areas at this park was based on the length and average width of trails, mostly paved trails.[33] However, increased visits to the trail system would not necessarily result in accelerated deterioration of the trails. According to research by the National Park Service, human-powered trail activities effectively have a minimal degradation on unsurfaced trails.[34] Therefore, the potential degradation of paved trails by an increased number of visitors at the Pearson-Arastradero Preserve and Baylands Nature Preserve is minimal, and no further analysis to these parks is necessary.

There are however, turf areas identified at the remaining four parks where the increase in visits from campus residents under the housing alternatives would exceed the screening threshold: 1) Neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks), 2) Heritage Park, and 3) Stanford Hills Park.

As none of these parks have a reservation system in place to ensure adequate recovery time for the turf areas, impacts to turf areas at these parks under Additional Housing Alternative A could be significant. Over the long term, cities plan for future turf replacement on a schedule that is needed to accommodate observed increases in park usage. However, the relatively large increase in turf usage that could occur under this alternative could necessitate an initial turf replacement more quickly than might have been planned. Because turf has a natural life, and must be replaced from time to time regardless of the increase in use caused by this alternative, a one-time turf replacement could offset the impact associated with possible acceleration of turf replacement. Therefore, mitigation for increased or accelerated physical deterioration to the turf areas due to

[32] The sensitivity analysis conducted for Additional Housing Alternative A showed that the inclusion of commuters did not change the conclusions of this analysis.

[33] The calculation of turf areas and active areas is documented on Pages 16.73 and 16.74 of Appendix REC of the Draft EIR.

[34] Marion and Olive, 2006. *Assessing and Understanding Trail Degradation: Results from Big South Fork National River and Recreational Area*. Retrieved from California Department of Parks and Recreation: https://www.parks.ca.gov/pages/1324/files/f10602%20marion&olive.pdf.

implementation of this alternative would take the form of a contribution toward one-time turf replacement at these parks as included below.

Conclusion

Similar to the proposed Project, Stanford is expected to provide adequate on-campus sports, fitness and recreation facilities for faculty, staff and students under Additional Housing Alternative A. As under the proposed Project, new and expanded indoor recreation facilities would be authorized as needed as part of the academic and academic support space authorized by the General Use Permit for this alternative.

However, as discussed above, the increase in campus residents anticipated to occur under the Additional Housing Alternative A would result in an increase in off-campus public park visits resulting in a significant impact to turfs at the College Terrace parks, Heritage Park, and Stanford Hills Park. Impacts related to deterioration of recreation facilities generated by Additional Housing Alternative A would be offset with implementation of **Mitigation Measure 7A.14-1(a)-(b)**, and thus, this impact would be reduced to less than significant with mitigation.

Furthermore, implementation of Improvement Measure 7A.14-1 identified for this alternative, which is the same as that identified for the proposed Project, would provide for park upgrade funds at the four College Terrace parks to ensure these parks remain in good condition.

> **Mitigation Measure 7A.14-1(a):** Prior to occupancy of net new on-campus housing units exceeding 4,425, Stanford shall provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs to provide for one-time turf replacement at Heritage Park. The amount of the contribution shall be determined by the County of Santa Clara based on an estimate from an independent contractor. The payment shall not be used for any purpose other than turf replacement at Heritage Park.
>
> Prior to occupancy of net new on-campus housing units exceeding 3,150, Stanford shall provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs to provide for one-time turf replacement at neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks). The amount of the contribution shall be determined by the County of Santa Clara based on an estimate from an independent contractor. The payment shall not be used for any purpose other than turf replacement at College Terrace parks.
>
> **Mitigation Measure 7A.14-1(b):** Prior to occupancy of net new on-campus housing units exceeding 4,425, Stanford shall provide to the City of Menlo Park a one-time contribution equivalent to the capital budget needs to provide for one-time turf replacement at Stanford Hills Park. The amount of the contribution shall be determined by the County of Santa Clara based on an estimate from an independent contractor. The payment shall not be used for any purpose other than turf replacement at Stanford Hills Park.
>
> **Significance after Mitigation:** Less than Significant.
>
> **Improvement Measure 7A.14-1:** Stanford has proposed to provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs previously identified by the City of Palo Alto (approximately $300,000) to provide for planned park upgrades

and ensure that the four College Terrace parks remain in good condition. These improvements identified in the Palo Alto Capital Budget were as follows:

- Tennis court upgrade ($215,000 planned for both Terman Park and Weisshaar Park, this good-neighbor offer assumes $140,000 is for Weisshaar Park), planned for FY 2021.

- Planned infrastructure improvements to upgrade and renovate safety and accessibility of the playground and other features in Cameron Park, approximately $160,000, planned for FY 2020.

Impact 7A.14-2: The construction of recreational facilities under Additional Housing Alternative A would cause physical effects on the environment. (*Significant*)

As with the proposed 2018 General Use Permit, under Additional Housing Alternative A, Stanford would likely relocate or replace some of its existing campus recreation facilities, and would use a portion of authorized net new academic and academic support square footage for new or expanded athletic and recreation facilities. Under this alternative, the placement of additional housing at the edges of the West Campus and DAPER and Administrative Development Districts could require development of lands that are currently used for existing recreation fields, which could, in turn, need to be relocated elsewhere on the campus.

Similar to the proposed Project, the creation of new open spaces and construction of recreational amenities on the Project site would result in physical effects. These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. As with the proposed Project, since on-campus recreational improvements are part of the overall anticipated development program under the alternative, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses above, including Section 7A.2 Air Quality, 7A.3 Biological Resources, 7A.4, Cultural Resources, 7A.8 Hazardous Materials, 7A.9 Hydrology and Water Quality, 7A.11 Noise and Vibration, and 7A.15 Transportation and Traffic. Similar to those mitigation measures identified for the proposed Project, the mitigation measures outlined in these respective topics for this alternative to reduce construction related impacts would similarly apply to on-campus park and recreation facility development.

Mitigation: Implement the following mitigation measures, as needed for construction of recreation facilities:

Air Quality

Mitigation Measure 7A.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 7A.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 7A.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 7A.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 7A.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 7A.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 7A.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 7A.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 7A.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 7A.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 7A.3-11(a)-(c): *Mitigation for protected trees during construction.*

Cultural Resources

Mitigation Measure 7A.4-2(a)-(b): *Mitigation for protection of archaeological resources during construction.*

Mitigation Measure 7A.4-3: *Mitigation for protection of paleontological resources during construction.*

Hazardous Materials

Mitigation Measure 7A.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 7A.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 7A.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 7A.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 7A.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 7A.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7A.14-3: Additional Housing Alternative A in combination with past, present, and reasonably foreseeable future projects would increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Significant*)

The geographic area for the cumulative analysis of public park and recreation facilities is focused on facilities on campus and those within three miles of the Project site. The increased demand by the Project on public park and recreation facilities (as identified under Impact 7A.14-1 above), would be coupled with that generated by the increased populations of the cities of Menlo Park and Palo Alto. Under its Comprehensive Plan Update, the City of Palo Alto considered its local City and sphere of influence population increase from 2014 to 2030 to range from 92,045 to 94,06, which correlates to an increase of 13 to 16 percent. Palo Alto's Comprehensive Plan Update Final EIR considers this population increase and concluded that cumulative impacts to parks and recreation facilities would be less that significant through compliance with the City's Municipal Code which would ensure that in-lieu fees and impact fees are collected for the creation of new or physically altered parks and recreational facilities to the extent feasible, and with implementation of mitigation to evaluate and mitigate the construction impacts associated with park and recreational facility creation and expansion (City of Palo Alto, 2017b). Similarly, the City of Menlo Park's 2016 update of its Land Use Element identified a 24-year population growth of nearly 53 percent by 2040. Evaluation of cumulative impacts to parks also concluded that conformity with General Plan goals and polices would ensure that adequate parklands and recreational facilities would be provided (City of Menlo Park, 2016).

Ultimately, while there is expected to be a cumulative population increase in the Project area, this growth is not expected to generate a cumulative significant impact to park and recreation facilities with the use of established municipal fee structures of the local jurisdictions. However, because the neighboring plans do not include assumptions of growth under Additional Housing Alternative A, the deterioration of off-campus park and recreation facilities at Pearson-Arastradero Preserve, Baylands Nature Preserve, the College Terrace parks, Heritage Park, and Stanford Hills Park from this alternative would contribute significantly to a cumulative recreation impact. Implementation of Mitigation Measure 7A.14-1(a)-(b), for a one-time turf replacement at these park facilities, would reduce the Stanford's contribution to a cumulative impact. The potential degradation of paved trails by an increased number of visitors at the Pearson-Arastradero Preserve and Baylands Nature Preserve is minimal, and no further analysis for these parks is necessary. Given all these factors, the cumulatively considerable impact identified to park and recreation facilities would be less than significant with mitigation.

Similar to the improvement measure identified for the proposed Project, implementation of Improvement Measure 7A.14-1 to provide for park upgrade funds at the four College Terrace parks to ensure these parks remain in good condition would further reduce Stanford's contribution to a cumulative impact.

Mitigation: Implement Mitigation Measure 7A.14-1(a)-(b).

Significance after Mitigation: Less than Significant.

Improvement Measure: Implement Improvement Measure 7A.14-1.

Transportation and Traffic[35]

Approach to Analysis

Vehicle Trip Generation

The trip generation was estimated for Additional Housing Alternative A using the same Stanford resident and commuter peak hour trip generation rates used for the proposed Project. It should be noted that the commuter trip generation rate is the average rate per Stanford commuter, which accounts for the fact that only a portion of the commuters drive to campus.

Table 7A.15-1 identifies the trip generation rates for campus commuters, campus residents living in student housing, and campus residents living in faculty/staff housing. A campus commuter is a Stanford affiliate who lives off campus. At Stanford, many commuters travel to the campus by taking public transit (Caltrain and buses) and/or Marguerite shuttles, bicycling, walking, vanpooling or carpooling. As a result, the vehicle trip generation rates for campus commuters are low. Table 7A.15-1 shows that in the morning peak hour, campus commuters generate 0.096 inbound trips per commuter and 0.041 outbound trips per commuter for a total of 0.137 morning peak hour trips per campus commuter. In the evening peak hour, campus commuters generate 0.084 inbound trips per commuter and 0.135 outbound trips per commuter for a total of 0.143 evening peak hour trips per campus commuter.

TABLE 7A.15-1
2018 GENERAL USE PERMIT VEHICLE TRIP GENERATION ESTIMATE

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Commuter (trips/Stanford affiliate living off campus)	0.096	0.041	0.137	0.051	0.084	0.135
Student Resident (trips/bed)	0.028	0.037	0.065	0.077	0.066	0.143
Faculty/Staff Resident (trips/unit)	0.150	0.280	0.430	0.260	0.190	0.450

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Table 7A.15-1 shows that the vehicle trip generation rates measured for on-campus faculty/staff housing units are higher than the trip generation rates for campus computers in both the inbound and outbound directions in both the morning and evening peak hours. The residential rates are the

35 The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives transportation impact analysis and VMT analyses prepared by Fehr & Peers Transportation Consultants for Stanford and independently peer reviewed by ESA; see Appendices ALT-TIA and ALT-VMT included in this document.

measured trip generation rates on a per-bed or per-unit basis at Stanford student and faculty/staff housing sites. Residential rates include trips by Stanford affiliates as well as spouses and other household members. A campus resident travels between the campus and other destinations for a variety of purposes, including shopping, dining out, religion, clubs and activities, recreation and exercise, entertainment, socializing, daycare, school, and off-campus employment. These types of trips can generate both outbound and inbound trips during the morning or evening periods. Faculty/staff housing units can also house non-Stanford affiliates as well as Stanford affiliates. In addition, many of the residence-based trips are not as amenable to transit and other modes such as vanpools as commute trips. In the morning peak hour, on-campus faculty/staff housing residential units generate 0.150 inbound trips per unit and 0.280 outbound trips per unit for a total of 0.430 morning peak hour trips per faculty/staff residential unit. In the evening peak hour, on-campus faculty/staff residential units generate 0.260 inbound trips per unit and 0.190 outbound trips per unit for a total of 0.450 evening peak hour trips per residential unit.

Under Additional Housing Alternative A, 2,342 more faculty/staff units are assumed to be constructed on the campus, as compared to the proposed 2018 General Use Permit. These units would reduce the population that otherwise would commute to the campus under Project conditions by 2,342 individuals.[36] Therefore, the trip generation estimation process starts by subtracting from Project conditions the commuters who would no longer commute to campus by multiplying 2,342 by the commuter trip generation rate and showing that result as a negative number. The trips associated with 2,342 new faculty/staff housing units are then added to that number to generate a net change in faculty/staff trips compared to Project conditions. The same process was used for the 210 graduate students who are assumed to be housed in new graduate student beds (note that the number of graduate students assumed to occupy the new beds incorporates an assumption for two-student couples).

Table 7A.15-2 presents the trip generation for the proposed Project, for reference, and **Table 7A.15-3** summarizes the residential trips added, commute trips eliminated, and the net change for this alternative.

TABLE 7A.15-2
2018 GENERAL USE PERMIT VEHICLE TRIP GENERATION ESTIMATE

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Total Campus Trips (based on academic space growth)	**751**	**428**	**1,179**	**600**	**779**	**1,379**
Residents	153	250	403	343	277	620
Non-Residential Generators (Commuters, visitors, others)	598	178	776	257	502	759

SOURCE: Fehr & Peers, August 2017 (see Draft EIR Appendix TIA)

[36] The trip generation calculations are based on the following uniform assumptions for all multi-family housing units: (1) the trip generation rates associated with all new multi-family housing units are the same as the surveyed trip rates per faculty/staff housing unit that were used for the Project; and (2) for purposes of deducting trips by commuters moving on to campus, the analysis conservatively assumes that each new multi-family housing unit would house one Stanford affiliate plus that affiliate's other household members.

TABLE 7A.15-3
ADDITIONAL HOUSING ALTERNATIVE A TRIP GENERATION ESTIMATE
(COMPARED TO PROPOSED 2018 GENERAL USE PERMIT)

	AM Peak Hour			PM Peak Hour		
Trip Type	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Resident Trips Added	357	664	1,021	625	459	1,084
Commuter Trips Eliminated	(244)	(106)	(350)	(130)	(213)	(344)
Net Change Compared to Project	113	558	671	495	246	740

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Compared to the proposed Project, Additional Housing Alternative A would generate a net increase in vehicle trips entering and leaving campus during the peak hours, due to the higher vehicle trip generating characteristics of faculty/staff residential units as compared to Stanford commuters. These trips would be in addition to those of the proposed Project. The faculty/staff residential units could house singles, couples and families, generating the full range of housing-related trips by vehicle and other modes. As explained above, faculty/staff residential units generate both inbound and outbound vehicle trips during the morning and evening peak periods. The residential trips would have a different distribution than the commuter trips, as described below.

Vehicle Trip Distribution

The commuter and resident trip distribution patterns for Additional Housing Alternative A are the same as for the proposed Project. The commuter distribution is based on Stanford off-campus resident locations, and the resident distribution is based on census data for the census tracts including the Stanford campus residential areas. These distribution patterns were used to distribute and assign the commuter trip reductions and residential bed/unit trip additions to the roadway network. In summary, Additional Housing Alternative A would contribute more trips to the local area when compared to the proposed Project.

Construction Impacts

Impact 7A.15-1: Additional Housing Alternative A would generate construction traffic that would cause a substantial reduction in mobility and in access to land uses. (*Significant*)

Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. Consequently, Additional Housing Alternative A would generate overall more construction traffic than would occur under the proposed Project. Similar to the proposed Project, impacts could include reduction in off-campus on-street parking; reduction in pedestrian, bicycle and public transit access; additional peak-hour traffic; use of non-truck routes by construction traffic; and interference with special events. These impacts would be significant.

Implementation of the following mitigation measures, same as those identified for the proposed Project, would reduce impacts of construction traffic to mobility and access to less-than-significant levels:

Mitigation Measure 7A.15-1: *Construction Traffic Control Measures.* The following traffic control measures are required to address impacts from construction of individual projects for Additional Housing Alternative A.

- ***Protection and Maintenance of Public Transit Access and Routes***. Stanford and its contractors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, during project construction without prior approval from the VTA and other affected jurisdictions. Such approvals shall require submittal and advance coordination per VTA's Bus Stop Relocation Policy of a mitigation plan to reduce transit impacts to a less than significant level. Potential actions that would impact access to transit include, but are not limited to, relocating or removing public transit bus stops, limiting access to public transit bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.

- ***Maintenance of Pedestrian Access***. Stanford and its contractors shall be prohibited from substantially limiting pedestrian access to properties or facilities during construction of the project, without prior approval from the affected jurisdictions. Such approvals shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting pedestrian access include, but are not limited to, sidewalk closures, bridge closures, crosswalk closures, pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided if determined by the County to be needed for pedestrian safety.

- ***Maintenance of Bicycle Access***. Stanford and its contractors shall be prohibited from substantially limiting bicycle access to properties or facilities during construction of the project, without prior approval from those jurisdictions. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting bicycle access include, but are not limited to, bike lane closures or narrowing, closing or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists.

- ***Protection and Maintenance of Emergency Service Access and Routes***. Stanford shall inform the Stanford Police and Palo Alto Police and Fire Departments of construction locations, and shall designate alternate evacuation and emergency routes to maintain response times during construction periods.

- ***Parking for Construction-Related Vehicles***. Stanford shall provide adequate on-campus parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the Stanford campus, a satellite parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to/from the job site.

- ***Restriction on Construction Delivery Hours***. Stanford shall make feasible attempts to avoid construction material deliveries from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM on weekdays. When feasible, Stanford shall be required to prohibit or limit the number of construction employees arriving or departing the site between 4:30 PM and 6:00 PM.

- ***Construction Truck Routes***. Stanford shall deliver and remove all construction-related equipment and materials on truck routes designated by the Cities of Palo Alto and Menlo Park and, in the event the County of San Mateo designates truck routes, by the County of San Mateo. Heavy construction vehicles shall be prohibited from accessing the site from routes that the Cities of Palo Alto, Menlo Park, or County of San Mateo have prohibited for use by such vehicles. Stanford shall provide written notification to all contractors regarding appropriate routes to and from construction sites and the weight and speed limits for local roads used to access construction sites. A copy of all such written notifications shall be submitted to the County Planning Office.

- ***Phone Number for Complaints***. Stanford shall post at least one sign no smaller than 1,296 square inches at all active construction sites. The sign shall contain the name, telephone number and e-mail address of the appropriate Stanford person the public may contact to report alleged violations of this mitigation measure or to register complaints about construction traffic associated with building projects under the 2018 General Use Permit. Stanford shall keep a written record of all such complaints and shall provide copies of these records to the County Planning Office as part of the annual report process.

- ***Construction Impact Mitigation Plan***. In lieu of the above mitigation measures, Stanford may submit a detailed construction impact mitigation plan to the County for review and approval prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. If Stanford determines that it is not feasible to comply with the "Restriction on Construction Delivery Hours" above, then the plan shall also explain the basis for this infeasibility determination. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.

- ***Construction During Special Events***. Stanford shall prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be obtained to host such events during significant construction phases.

Significance after Mitigation: Less than Significant.

Operational Impacts

2018 Baseline With Additional Housing Alternative A Conditions

Impact 7A.15-2: Implementation of Additional Housing Alternative A could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Additional Housing Alternative A conditions. (*Significant*)

Impacts associated with Additional Housing Alternative A are identified by comparing the 2018 Baseline traffic volumes to the 2018 Baseline with Additional Housing Alternative A Conditions traffic volumes. Significant impacts are identified based on the applicable impact criteria, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay and critical V/C ratios[37] for intersections operating unacceptably. The results of the LOS analysis are summarized in **Table 7A.15-4**. Significant impacts would occur at five intersections under this alternative – the same five that would occur under the proposed Project.[38] Generally, at the study intersections located closest to the campus, Additional Housing Alternative A would increase congestion compared to the proposed Project. At the study intersections located farther from the campus, this alternative would reduce congestion by a small degree compared to the proposed Project because peak-hour, peak-direction residence-based trips are assumed to start and end at destinations closer to the Stanford campus as compared to peak-hour, peak-direction commute trips. When compared to the proposed Project, Additional Housing Alternative A would add approximately 200 to 220 peak hour trips to intersections directly adjacent to the campus along El Camino Real and between 30 to 130 peak hour trips to intersections that border the campus along Sand Hill Road and Junipero Serra Boulevard. Overall, Additional Housing Alternative A would not reduce significant effects of the proposed 2018 General Use Permit under 2018 conditions.

The intersections where Additional Housing Alternative A would have a significant impact under 2018 Baseline with Additional Housing Alternative A conditions, and the reason that the impact is considered significant, are documented in **Table 7A.15-5**. Measures/strategies to mitigate the significant impacts are described below.

Mitigation Measure 7A.15-2(a) addresses peak hour, peak direction project impacts, with fair share mitigation fees triggered if the "no net new commute trips" standard is not achieved, while Mitigation Measure 7A.15-2(b) addresses peak-hour, off-peak (reverse commute) direction impacts, which are not subject to the "no net new commute trips" standard and, therefore, fair share mitigation fees are triggered upon project approval.[40a]

[37] V/C ratios (volume-to-capacity ratios) are calculated based on traffic volumes and capacity values for various types of roadways that comprise intersections.

[38] The Draft EIR identified one additional intersection with a significant impact under the proposed 2018 General Use Permit, at Intersection #31, Foothill Expressway / San Antonio Road. However, that result was due to a volume error that has since been corrected. This correction will be reflected in the forthcoming Response to Comments Document.

[40a] Fehr and Peers, 2018 Stanford General Use Permit: Reverse-Commute Analysis, Appendix RCA.

TABLE 7A.15-4
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
1	I-280 NB On-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.4 12.5	B+ B	10.2 13.5	B+ B	0.015 0.032	-0.2 1.1	10.1 13.5	B+ B	0.026 0.031	-0.3 1.1
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**137.4** 21.4	**F** C+	**0.038** 0.021	**18.9** 0.2	**136.9** 22.1	**F** C+	**0.037** 0.035	**18.4** 0.9
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	32.4 21.0	C- C+	42.4 21.7	D C+	0.037 0.032	15.7 1.3	40.6 21.6	D C+	0.032 0.031	13.2 1.3
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	15.0 21.7	B C+	15.3 21.2	B C+	0.036 0.031	0.6 -0.5	15.3 21.1	B C+	0.031 0.030	0.5 -0.5
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	16.7 16.6	B B	16.8 16.3	B B	0.036 0.032	0.4 -0.1	16.7 16.3	B B	0.031 0.031	0.3 -0.1
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	16.1 16.9	B B	16.0 16.8	B B	0.000 0.000	0.0 0.0	16.0 16.8	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	48.9 48.1	D D	49.8 49.0	D D	0.031 0.038	1.4 1.7	50.7 49.1	D D	0.050 0.036	3.8 1.5
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.6 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.0 0.1	10.4 3.9	B+ A	0.029 0.032	0.0 0.1
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	23.3 28.2	C C	24.3 29.2	C C	0.028 0.027	1.6 1.2	23.5 28.7	C C	0.030 0.032	0.9 0.8
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.9 27.3	C+ C	20.9 27.7	C+ C	0.009 0.017	0.3 0.7	20.7 27.5	C+ C	0.020 0.028	0.3 0.5
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	18.5 27.3	B- C	19.3 27.8	B- C	0.013 0.017	1.3 0.9	20.4 28.5	C+ C	0.033 0.033	2.8 2.0
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	39.0 34.1	D C-	38.9 34.3	D+ C-	0.012 0.016	-0.1 0.3	39.3 34.4	D C-	0.017 0.016	0.4 0.3
13	I-280 SB Ramps / Page Mill Rd*	Santa Clara County	LOS E (warrant)	AM PM	**151.7** **85.9**	**F** **F**	**153.3** **88.3**	**F** **F**	N/A	N/A	**154.0** **89.2**	**F** **F**	N/A	N/A
14	I-280 NB Ramps / Page Mill Rd*	Santa Clara County	LOS E (warrant)	AM PM	40.5 14.8	E B	41.5 14.9	E B	N/A	N/A	41.6 15.0	E B	N/A	N/A
15	Deer Creek Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	14.5 13.5	B B	15.4 13.7	B B	0.026 0.021	1.4 -0.3	15.4 13.7	B B	0.027 0.034	1.5 -0.4
16	Coyote Hill Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	7.5 9.0	A A	8.0 9.4	A A	0.014 0.021	0.0 -0.2	8.0 9.5	A A	0.028 0.033	0.0 -0.2
17	Junipero Serra Blvd - Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**101.5** **109.9**	**F** **F**	**0.029** **0.063**	**7.2** **19.3**	**110.6** **113.0**	**F** **F**	**0.067** **0.079**	**24.9** **21.2**

TABLE 7A.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
18	Peter Coutts / Page Mill Rd	Santa Clara County	LOS E	AM PM	20.9 29.7	C+ C	21.3 29.8	C+ C	0.020 0.015	0.6 0.0	22.1 30.6	C+ C	0.036 0.030	1.6 0.7
19	Hanover St / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	63.0 47.6	E D	65.7 48.2	E D	0.013 0.017	0.6 -0.1	69.1 59.5	E E+	0.025 0.133	1.2 16
20	El Camino Real / Page Mill Rd - Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	61.2 66.2	E E	66.1 68.8	E E	0.047 0.021	6.5 2.7	71.0 72.0	E E	0.090 0.041	18.2 8.9
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	63.6 58.5	E E+	64.2 58.9	E E+	0.009 0.012	1.0 0.5	64.8 59.3	E E+	0.013 0.017	1.7 0.8
22	Oregon Expy / West Bayshore Rd	Santa Clara County	LOS E	AM PM	20.7 18.9	C+ B-	20.7 19.1	C+ B-	0.003 0.008	0.1 0.2	20.8 19.3	C+ B-	0.011 0.017	0.2 0.7
23	I-280 SB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	40.2 16.1	E C	41.0 16.2	E C	N/A	N/A	40.6 16.2	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	27.2 26.8	D D	28.5 29.9	D D	N/A	N/A	29.0 29.9	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Rd	Menlo Park	LOS D	AM PM	43.8 48.8	D D	46.2 50.9	D D	0.049 0.048	3.0 2.4	46.3 50.9	D D	0.046 0.053	2.8 2.6
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	28.7 40.7	C D	30.5 45.4	C D	0.009 0.052	1.2 5.9	32.2 44.3	C- D	0.042 0.041	4.9 4.1
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14.1 16.3	B B	14.5 17.9	B B	0.020 0.036	0.8 2.8	14.7 17.9	B B	0.041 0.051	1.3 2.3
28	Junipero Serra Blvd / Stanford Ave	Santa Clara County	LOS E	AM PM	19.6 21.1	B- C+	21.0 25.1	C+ C	0.061 0.076	1.8 4.4	22.7 26.3	C+ C	0.094 0.117	3.9 6.2
29	Foothill Expy / Hillview Ave	Santa Clara County	LOS E	AM PM	35.0 34.9	C- C-	35.7 35.1	D+ D+	0.006 0.015	-0.3 0.2	35.8 35.3	D+ D+	0.009 0.013	-0.3 0.2
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	74.7 **95.8**	E **F**	0.016 **0.150**	4.6 **-1.0**	73.8 **95.1**	E **F**	0.015 **0.148**	3.2 **-2.2**
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	LOS E	AM PM	18.7 75.8	B- E-	19.2 78.5	B- E-	0.016 0.022	0.6 4.7	19.0 77.7	B- E-	0.012 0.017	0.4 3.1
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	LOS E	AM PM	74.6 **88.9**	E **F**	79.0 **89.9**	E- **F**	0.014 **0.004**	9.5 **1.3**	77.8 **89.6**	E- **F**	0.011 **0.003**	7.0 **0.7**
33	Foothill Expy / Springer Road-Magdalena Ave	Santa Clara County (SC CMP)	LOS E	AM PM	62.6 71.9	E E	64.0 73.2	E E	0.015 0.010	1.9 2.3	63.6 73.3	E E	0.011 0.009	1.5 2.3
34	Bowdoin St / Stanford Ave*	Palo Alto	LOS E (warrant)	AM PM	14.4 18.5	B C	18.4 27.6	C D	N/A	N/A	20.1 35.9	C E	N/A	N/A

TABLE 7A.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
35	Arboretum Rd / Quarry Rd	Palo Alto	LOS D	AM PM	43.6 41.5	D D	44.1 42.1	D D	0.040 0.039	1.2 1.4	45.1 43.3	D D	0.079 0.075	3.3 3.1
36	Arboretum Rd / Palm Dr	Palo Alto	LOS D	AM PM	29.9 28.6	C C	31.9 29.4	C C	0.085 0.044	3.3 1.3	32.9 30.3	C- C	0.098 0.070	4.8 2.4
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	17.2 29.9	B C	17.0 29.8	B C	0.011 0.015	-0.1 0.1	17.0 29.8	B C	0.009 0.013	-0.1 0.1
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	42.5 42.0	D D	42.4 42.2	D D	0.017 0.015	0.4 0.5	42.3 42.1	D D	0.013 0.014	0.2 0.4
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	31.3 35.6	C D+	31.0 35.4	C D+	0.018 0.017	-0.3 -0.1	31.0 35.4	C D+	0.014 0.015	-0.2 -0.1
40	El Camino Real / Santa Cruz Ave	Menlo Park	LOS D	AM PM	14.0 23.0	B C	13.8 22.7	B C+	0.018 0.016	-0.3 -0.4	13.8 22.6	B C+	0.014 0.025	-0.2 -0.3
41	El Camino Real / Ravenswood Rd	Menlo Park	LOS D	AM PM	43.7 47.0	D D	43.9 47.2	D D	0.022 0.020	0.6 0.7	43.9 47.4	D D	0.019 0.021	0.6 0.9
42	El Camino Real / Roble Ave	Menlo Park	LOS D	AM PM	14.4 14.7	B B	14.1 14.3	B B	0.014 0.013	-0.3 -0.3	14.1 14.3	B B	0.013 0.013	-0.3 -0.3
43	El Camino Real / Middle Ave	Menlo Park	LOS D	AM PM	27.2 27.5	C C	27.0 27.2	C C	0.014 0.009	-0.3 -0.2	27.0 27.3	C C	0.013 0.012	-0.2 -0.2
44	El Camino Real / Cambridge Ave	Menlo Park	LOS D	AM PM	13.6 19.6	B B-	13.4 19.5	B B-	0.014 0.009	-0.3 -0.2	13.4 19.5	B B-	0.013 0.012	-0.2 -0.2
45	El Camino Real / Quarry Rd	Palo Alto	LOS D	AM PM	14.3 33.2	B C-	15.8 34.2	B C-	0.029 0.031	1.6 1.6	16.5 34.9	B C-	0.036 0.051	2.4 2.6
46	El Camino Real (SB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	21.1 20.3	C+ C+	20.7 20.0	C+ C+	0.028 0.030	-0.2 -0.3	20.9 20.0	C+ C+	0.028 0.042	-0.3 0.1
47	El Camino Real (NB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	19.5 26.3	B- C	20.0 26.4	B- C	0.030 0.033	0.4 0.8	20.4 26.3	C+ C	0.043 0.053	1.3 0.5
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	LOS E	AM PM	45.9 51.1	D D-	47.5 54.9	D D-	0.047 0.059	2.0 7.0	47.6 58.5	D E+	0.063 0.099	2.3 14.6
49	El Camino Real / Churchill Ave	Palo Alto	LOS D	AM PM	24.7 26.6	C C	24.4 26.4	C C	0.017 0.018	-0.1 -0.1	24.2 26.4	C C	0.038 0.043	-0.2 0.1
50	El Camino Real / Serra St	Palo Alto	LOS D	AM PM	24.5 28.0	C C	27.8 33.2	C C-	0.082 0.112	5.4 8.0	33.3 38.4	C- D+	0.181 0.220	11.5 16.7
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	33.0 31.9	C- C	33.8 33.1	C- C-	0.060 0.054	11.5 2.0	33.8 33.8	C- C-	0.101 0.083	11.3 3.2

TABLE 7A.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	24.0 28.8	C C	22.8 27.9	C+ C	0.029 0.031	-0.9 -0.7	22.3 27.6	C+ C	0.038 0.046	-1.1 -1.0
53	El Camino Real / Arastradero Rd - Charleston Rd	Palo Alto (SC CMP)	LOS E	AM PM	47.8 55.6	D E+	48.3 56.3	D E+	0.020 0.007	0.9 0.4	48.8 56.4	D E+	0.029 0.008	1.8 0.4
54	El Camino Real / San Antonio Rd	Mountain View (SC CMP)	LOS E	AM PM	53.4 53.6	D- D-	53.4 53.5	D- D-	0.008 0.007	0.0 -0.1	53.3 53.5	D- D-	0.007 0.007	0.0 -0.1
55	Alma St / Lytton Ave	Palo Alto	LOS D	AM PM	20.8 18.0	C+ B	21.8 18.6	C+ B-	0.016 0.015	1.5 0.8	22.1 19.2	C+ B-	0.026 0.032	2.0 1.7
56	Alma St / Hamilton Ave	Palo Alto	LOS D	AM PM	6.9 14.9	A B	7.1 15.3	A B	0.008 0.012	0.2 0.8	7.2 16.0	A B	0.014 0.028	0.4 2.1
57	Alma St / Churchill Ave	Palo Alto	LOS D	AM PM	28.2 48.3	C D	28.3 48.3	C D	0.005 0.005	0.1 0.0	28.5 48.5	C D	0.007 0.010	0.3 0.4
58	Alma St / Charleston Rd	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**55.7** **55.9**	**E+** **E+**	**0.010** **0.017**	**0.5** **1.1**	**56.3** **56.5**	**E+** **E+**	**0.017** **0.024**	**1.3** **1.6**
59	Middlefield Rd / Marsh Rd	Atherton	LOS D	AM PM	29.2 53.9	C D-	30.1 54.4	C D-	0.012 0.005	1.4 0.8	30.1 54.4	C D-	0.012 0.005	1.4 0.9
60	Middlefield Rd / Ravenswood Ave	Menlo Park	LOS D	AM PM	34.3 40.4	C- D	35.0 41.2	C- D	0.012 0.012	0.8 0.9	35.2 41.4	D+ D	0.014 0.017	1.1 1.1
61	Middlefield Rd / Ringwood Ave	Menlo Park	LOS D	AM PM	38.0 50.6	D+ D	38.1 50.7	D+ D	0.004 0.005	0.2 0.2	38.4 51	D+ D-	0.009 0.011	0.6 0.6
62	Middlefield Rd / Willow Rd	Menlo Park	LOS D	AM PM	47.9 47.3	D D	48.0 47.5	D D	0.007 0.006	5.3 0.2	48.0 47.6	D D	0.006 0.009	5.3 0.2
63	Middlefield Rd / Lytton Ave	Palo Alto	LOS D	AM PM	38.0 45.9	D+ D	38.3 46.5	D+ D	0.018 0.016	0.4 0.6	38.4 46.5	D+ D	0.018 0.017	0.4 0.6
64	Middlefield Rd / University Ave	Palo Alto	LOS D	AM PM	30.0 35.6	C D+	30.3 36.1	C D+	0.019 0.031	0.3 0.9	30.4 36.0	C D+	0.017 0.031	0.3 0.9
65	Middlefield Rd / Hamilton Ave	Palo Alto	LOS D	AM PM	11.5 11.6	B+ B+	11.5 11.6	B+ B+	0.009 0.007	0.0 0.0	11.5 11.7	B+ B+	0.007 0.009	0.0 0.1
66	Middlefield Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	33.7 39.6	C- D	34.1 40.1	C- D	0.030 0.025	0.7 0.5	34.2 40.2	C- D	0.029 0.024	0.8 0.6
67	St. Francis Drive / Embarcadero Road	Palo Alto	LOS D	AM PM	23.6 17.5	C B	23.4 17.3	C B	0.015 0.014	0.0 -0.1	23.4 17.3	C B	0.013 0.013	0.0 -0.1
68	E. Bayshore Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	51.3 **57.6**	D- **E+**	51.6 **58.1**	D- **E+**	0.007 **0.005**	0.4 **0.6**	51.9 **58.5**	D- **E+**	0.008 **0.010**	0.7 **1.2**

TABLE 7A.15-4 (CONTINUED)
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ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	50.5 52.6	D D-	50.6 52.7	D D-	0.004 0.006	0.0 0.2	50.7 53.0	D D-	0.007 0.012	0.1 0.7
70	US 101 SB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	32.6 33.9	C- C-	32.6 33.9	C- C-	0.000 0.000	0.0 0.0	32.6 33.8	C- C-	0.000 0.000	0.0 0.0
71	US 101 NB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	18.2 20.7	B- C+	18.2 20.7	B- C+	0.000 0.000	0.0 0.0	18.5 21.4	B- C+	0.014 0.017	0.5 1.2
72	Bay Rd / Willow Rd	Menlo Park	LOS D	AM PM	18.8 10.7	B- B+	18.8 10.7	B- B+	0.008 0.006	0.1 0.0	18.9 10.7	B- B+	0.008 0.008	0.1 0.1
73	Newbridge St / Willow Rd	Menlo Park	LOS D	AM PM	43.5 44.1	D D	43.4 44.1	D D	0.005 0.004	0.0 0.2	43.4 44.2	D D	0.006 0.006	0.0 0.3
74	O'Brien Dr / Willow Rd	Menlo Park	LOS D	AM PM	12.0 14.5	B+ B	11.9 14.5	B+ B	0.003 0.005	0.0 0.0	11.9 14.4	B+ B	0.005 0.005	0.0 0.0
75	Hamilton Ave / Willow Rd	Menlo Park	LOS D	AM PM	40.9 45.3	D D	41.5 45.5	D D	0.005 0.003	1.0 0.3	41.6 45.6	D D	0.006 0.006	1.1 0.5
76	Bayfront Expy / Willow Rd	Menlo Park (SM CMP)	LOS F	AM PM	40.3 57.8	D E+	40.3 58.0	D E+	0.000 0.004	0.0 0.2	40.3 58.0	D E+	0.000 0.004	0.0 0.2
77	Woodland Ave / University Ave	East Palo Alto	LOS D	AM PM	54.5 **60.1**	D- **E**	54.8 **60.3**	D- **E**	0.000 **0.000**	0.0 **0.0**	54.9 **60.3**	D- **E**	0.000 **0.000**	0.0 **0.0**
78	US 101 SB Ramps / University Ave	East Palo Alto	LOS D	AM PM	29.4 25.5	C C	29.4 25.5	C C	0.003 0.006	0.1 0.1	29.5 25.5	C C	0.006 0.007	0.2 0.1
79	Donohoe St / University Ave	East Palo Alto	LOS D	AM PM	**72.4** 44.3	**E** D	**73.2** 44.3	**E** D	**0.005** 0.004	**1.3** 0.1	**73.1** 44.3	**E** D	**0.005** 0.005	**1.2** 0.1
80	University Ave / Bay Rd	East Palo Alto	LOS D	AM PM	48.6 50.1	D D	48.7 50.6	D D	0.005 0.009	0.2 0.9	48.7 50.9	D D	0.005 0.014	0.1 1.5
81	University Ave / Bayfront Expy	Menlo Park (SM CMP)	LOS F	AM PM	23.6 94.4	C F	23.7 96.9	C F	0.008 0.007	0.2 3.1	23.7 97.5	C F	0.009 0.009	0.3 3.9
82	Town & Country Driveway / Embarcadero Rd	Palo Alto	LOS D	AM PM	28.9 28.4	C C	28.1 28.0	C C	0.031 0.021	-0.6 -0.3	28.1 27.9	C C	0.028 0.03	-0.5 -0.3
83	Charleston Rd / San Antonio Rd	Palo Alto (SC CMP)	LOS E	AM PM	61.6 62.5	E E	61.8 62.7	E E	0.001 0.002	0.3 0.4	61.9 62.8	E E	0.002 0.002	0.6 0.4
84	US 101 SB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	11.4 13.0	B+ B	11.5 13.0	B+ B	0.002 0.000	0.2 0.0	11.4 13.0	B+ B	0.002 0	0.1 0.0
85	US 101 NB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	21.1 23.5	C+ C	21.2 23.5	C+ C	0.000 0.002	0.0 0.1	27.4 29.8	C C	0.187 0.145	18.6 14.7

TABLE 7A.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
86	Central Expy / Rengstorff Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**175.3** **83.9**	**F** **F**	**177.4** **86.1**	**F** **F**	**0.010** **0.008**	**3.1** **1.3**	**177.1** **86.0**	**F** **F**	**0.008** **0.009**	**2.7** **1.1**
87	Central Expy / Shoreline Blvd (N)	Santa Clara County (SC CMP)	LOS E	AM PM	3.6 7.0	A A	3.6 6.9	A A	0.003 0.007	0.0 -0.1	3.6 6.9	A A	0.006 0.007	-0.1 -0.1
88	Central Expy / Shoreline Blvd (S)	Santa Clara County (SC CMP)	LOS E	AM PM	12.0 7.6	B+ A	11.9 7.5	B+ A	0.003 0.005	-0.1 0.0	11.9 7.5	B+ A	0.006 0.007	-0.3 0.0
89	Central Expy / Castro St-Moffett Blvd	Santa Clara County (SC CMP)	LOS E	AM PM	**122.6** **94.4**	**F** **F**	**125.1** **97.1**	**F** **F**	**0.007** **0.006**	**4.1** **3.3**	**124.8** **97.7**	**F** **F**	**0.006** **0.008**	**3.7** **4.4**
90	Foothill Expy / Edith Ave	Santa Clara County	LOS E	AM PM	28.9 39.0	C D+	29.2 43.2	C D	0.016 0.288	0.6 22.9	29.1 41.2	C D	0.012 0.009	0.4 -0.2
91	Foothill Expy / Main St	Santa Clara County (SC CMP)	LOS E	AM PM	23.0 24.3	C+ C	23.2 24.4	C C	0.016 0.009	0.5 -0.4	23.1 24.4	C C	0.012 0.009	0.4 -0.4
92	University Ave / O'Brien Dr	Menlo Park	LOS D	AM PM	9.2 12.7	A B	9.2 12.7	A B	0.005 0.006	0.0 0.0	9.1 12.7	A B	0.005 0.008	0.0 0.0
93	University Ave / Adams Dr*	Menlo Park	LOS E (warrant)	AM PM	76.3 30.7	F[10] D	79.8 31.9	F[10] D	N/A	N/A	81.1 32.6	F[10] D	N/A	N/A
94	University Ave / Runnymede St	East Palo Alto	LOS D	AM PM	15.3 19.9	B B-	15.3 19.8	B B-	0.005 0.005	0.0 0.0	15.3 19.8	B B-	0.005 0.006	0.0 -0.1
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 18.2	B B-	14.7 18.1	B B-	0.005 0.005	0.0 -0.1	14.7 18.0	B B-	0.005 0.006	0.0 -0.1

NOTES: **Bold text** indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

In some cases, intersections may show a reduction in average delay with the addition of Project traffic, or with the addition of Additional Housing Alternative A traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County, "(SM CMP)" indicates CMP intersection in San Mateo County.

[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(Warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.

[c] AM = morning peak hour, PM = evening peak hour.

[d] Background (2018) With Proposed 2018 General Use Permit presents the results it was included in the Draft EIR. These results are provided for comparison purposes only.

[e] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.

[f] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software packages, which applies the methods described in the 2000 *Highway Capacity Manual*.

[g] Change ("Δ") in critical volume to capacity ratio (V/C) between Background (2018) and Background (2018) With Project; and between Background (2018) and Background (2018) With Additional Housing Alternative A Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[h] Change ("Δ") in average critical movement delay between Background (2018) and Background (2018) With Project; and between Background (2018) and Background (2018 With Additional Housing Alternative A Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[i] A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

TABLE 7A.15-5
2018 BASELINE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#13 I-280 SB Off-Ramp / Page Mill Road (AM and PM Peak Hours)	**Unsignalized Intersection:** Under unacceptable LOS F conditions without and with the project, peak-hour traffic signal warrant would be met.
#17 Junipero Serra Blvd – Foothill Expy / Page Mill Rd (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Project-generated traffic would cause a degradation from an acceptable LOS D to an unacceptable LOS E.

Mitigation Measure 7A.15-2(a): Stanford shall mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of fair share fees for the improvements for adversely affected intersections specified in Table 1A [minus the contribution to these improvements provided pursuant to Mitigation Measure 7A.15-2(b), below], which funds shall be expended by the County to fund mitigation efforts.

1. As specified on page 64 and Policy C-1 of the Stanford Community Plan, the no net new commute trips standard is defined as no increase in automobile trips during peak commute times in the peak commute direction, as counted at defined cordon locations around the central campus. The peak commute period is defined as the one-hour period in the morning (AM) and afternoon (PM) with the highest volume of traffic at the cordon locations, as determined by traffic counts.

2. The reasonable cost of all traffic counts and other work conducted for determination of compliance with this mitigation measure shall be paid for by Stanford. The counts shall be performed by an independent consultant under the direction of the County Planning Office or provided to the County Planning Office through another County-approved methodology.

3. The baseline for measuring the no net new commute trips standard shall be the count that was established in 2001. However, during implementation of the 2018 General Use Permit, the County may modify, or approve Stanford-proposed modifications to the monitoring methodology on new technology such as automation, so long as the basic principles underlying the no net new commute trips standard are still met. If the monitoring methodology is updated, testing and calibration of the new methodology or equipment will require coordination with the County. The County may adjust the 2001 baseline as needed to reflect any such calibration. Monitoring counts shall be performed each year using the County-approved methodology.

TABLE 1A
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE A

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alt. A	2035 Cumulative with Additional Housing Alt. A
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	Contribute fair share funding toward the addition of second northbound right-turn lane, as identified in the ConnectMenlo Final Environmental Impact Report.	X	X
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X	
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair-share funding toward grade separation project (County Expressway Plan 2040).	X	X
19	Hanover St / Page Mill Rd – Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a second westbound left-turn lane, identified as an option in the Page Mill Expressway Corridor Study Report.		X
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report. Contribute fair-share funding toward the installation of a southbound right-turn lane and overlap phase.		X
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	No feasible mitigation measure.		X
29	Foothill Expy / Hillview Ave	Santa Clara County	No feasible mitigation measure.		X
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward a grade separation improvement project, as identified in the draft Santa Clara County Expressway Plan 2040. The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.	X	X
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue as identified in the draft Santa Clara County Expressway Plan 2040.		X
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third northbound through lane and associated receiving lane that extends to San Antonio Avenue, as identified in the draft Santa Clara County Expressway Plan 2040.		X

TABLE 1A (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE A

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alt. A	2035 Cumulative with Additional Housing Alt. A
33	Foothill Expy / Springer Road - Magdalena Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the following improvements, as identified as a Tier 2 improvement in the draft Santa Clara County Expressway Plan 2040: • Convert the signal to provide 8-phase phasing; • Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and • Change the configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.		X
34	Bowdoin Street / Stanford Avenue	Palo Alto	Contribute fair-share funding toward the installation of a signal.		X
37	El Camino Real / Encinal Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
38	El Camino Real / Valparaiso Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane. Contribute fair-share funding toward widening Menlo Avenue for an exclusive left-turn lane.		X
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	Contribute fair share funding toward the addition of a second northbound left-turn lane.		X
56	Alma St / Hamilton Ave	Palo Alto	Contribute fair share funding toward the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, by removing a portion of the parking.		X
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements.	X	X
59	Middlefield Rd / Marsh Rd	Atherton	Contribute fair share funding toward the addition of a second westbound left-turn lane and second receiving lane on the south leg.		X
63	Middlefield Rd / Lytton Ave	Palo Alto	No feasible mitigation measure.		X
66	Middlefield Rd / Embarcadero Rd	Palo Alto	No feasible mitigation measure.		X
69	Middlefield Road / Charleston Road	Palo Alto	Contribute fair-share funding to the addition of a designated eastbound right-turn lane with an overlap signal phase		X

TABLE 1A (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE A

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alternative A	2035 Cumulative with Additional Housing Alternative A
89	Central Expy / Moffett Blvd	Santa Clara County (SC CMP)	The City of Mountain View's planned closure of Castro Street at the train tracks to form a T-intersection of Central Expressway and Moffett Boulevard would mitigate Additional Housing Alternative A's impact (Mountain View Transit Center Master Plan). If the Castro Street closure project is not implemented, the secondary, back-up mitigation is to contribute fair-share funding toward the construction of a second southbound left turn lane from Central Expressway to Moffett Boulevard. Stanford shall contribute its fair share funding toward the second southbound left-turn lane from Central Expressway to Moffet Boulevard. The funding can be used for the Castro Street Closure project.		X
90	Foothill Expressway / Edith Avenue	Santa Clara County (SC CMP)	No feasible mitigation measure.		X

4. Traffic counts and determination of traffic volumes shall occur as described below, unless modifications are approved by the County Planning Office.

    a. Peak-hour traffic for a single year shall be determined through counts taken at two times during the year. All counts shall be conducted during the regular academic year, which does not include academic breaks or end-of-quarter finals. Homecoming or other irregular traffic patterns should be avoided. Specific dates for each count shall be determined by the County Planning Office. The two annual counts shall be averaged to determine the annual traffic level for each monitoring year.

        i. During monitoring periods, the total amount of traffic crossing the cordon line will be counted by travel direction. The cordon count monitoring will be conducted on a 24-hour basis. The morning (AM) and afternoon (PM) peak hours within the 24-hour count period will be calculated based on total volumes to determine the campus-wide peak hours.

        ii. All counts shall be taken at the campus entry and exit points shown in Figure 5.15-2, which together form the defined cordon line. Additional cordon gateways may be added or the location of the cordon line may be modified as determined by the County.

            a) Traffic counts shall include a methodology to determine the rate of cut-through traffic.

                1) Cut-through trips will be identified through license plates on each vehicle or other means. Entry and exit times will be noted to determine when a vehicle crosses the cordon in either direction.

                2) Matching license plates will be determined by comparing numbers that crossed both an entering and exiting cordon within a defined period (i.e., 20 minutes or as updated), or through other means. Vehicles that enter and exit the cordon within the time period will be cut-through trips across the campus without a campus-related purpose. If data are available or it is feasible to measure, the County will include in the cordon counts all rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs.

            b) Cordon volumes will be adjusted to account for use of parking lots within the cordon line by hospital-related traffic and use of lots outside the cordon line by campus-related traffic. Parking areas change due to the evolving needs of campus and hospital operations. The lots used for hospital and university parking shall be confirmed prior to annual surveys. The County reserves the right to change the methodology related to hospital parking or other parking factors in response to changing conditions.

                1) Hospital trips will be subtracted from the count and campus trips will be added to the count. The count adjustment will also factor in the potential for hospital trips to park in the campus lots and campus

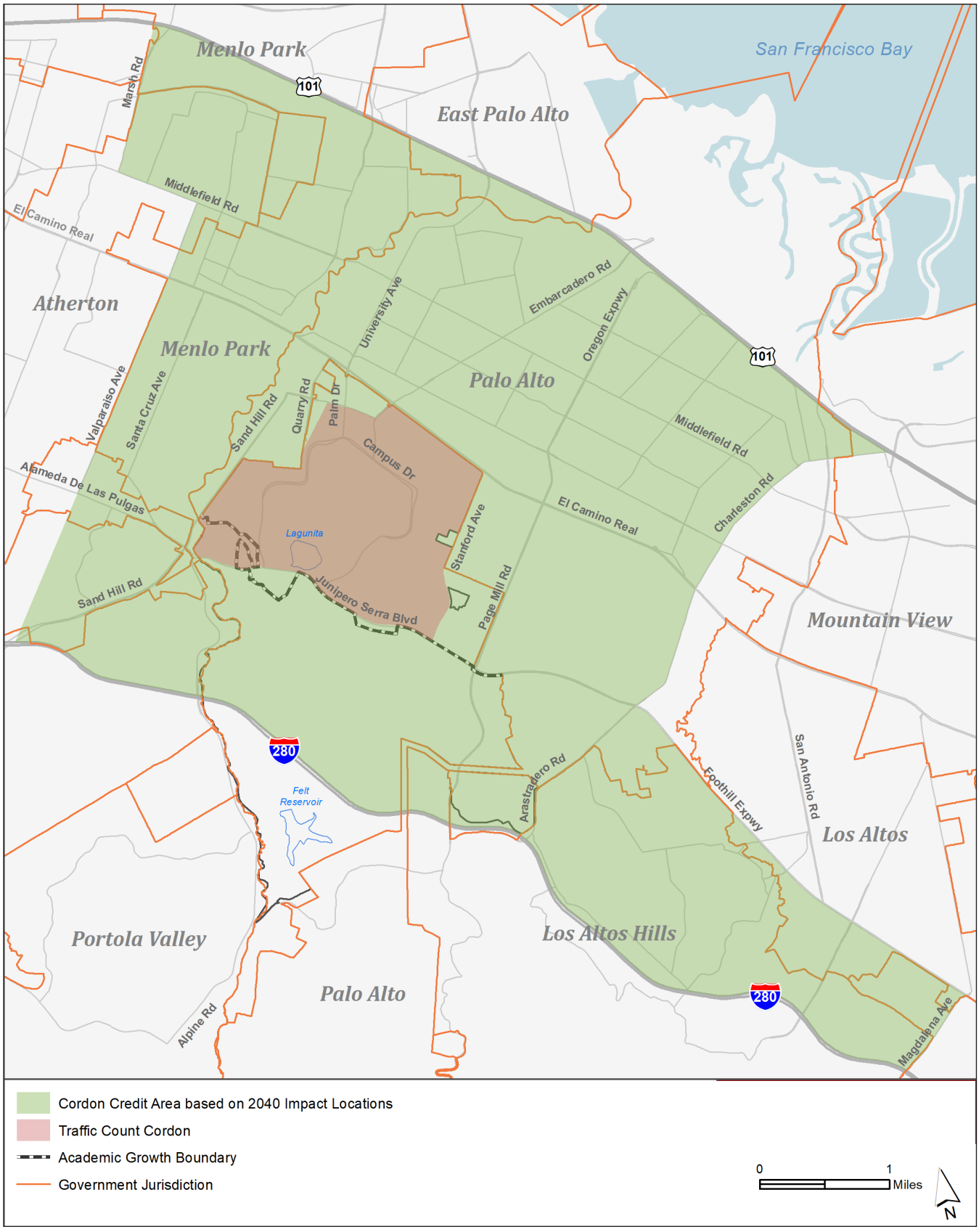
trips to park in the hospital lots. At the beginning and end of the peak hours, data will need to be collected from each lot. If campus parking occurs in lots outside the cordon, trips associated with those vehicles will be added back into the count. If hospital parking occurs inside the cordon, trips associated with those vehicles will be subtracted from the count. All vehicles without a parking permit will be assumed to be correctly parked in their respective lots, unless the County approves an alternate protocol for assigning such parking.

c) Based on the 24-hour counts, the AM and PM peak hours will be identified for the campus. Peak hour traffic volume will be determined for the campus based on the count, adjusted for cut-through traffic and hospital parking as described above.

1) Total entering and exiting traffic will be summed for the 16 campus gateways. A single AM and PM peak hour will be determined for the entire campus based on the peak inbound traffic in the AM period and the peak outbound traffic in the PM period. The percent of cut-through trips calculated by the license plate matching (or other technology) described above will be removed. With the exception of rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs, the cut-through vehicles will be removed from both the inbound and the outbound traffic since they will have been observed crossing both an entering and exiting cordon boundary. Finally, the entering and exiting traffic for hospital uses inside the cordon boundary and the campus uses outside the cordon boundary calculated as described above will be subtracted from or added to the counts.

5. As specified by Community Plan Policy C-8, the County Planning Office will recognize participation by Stanford in off-campus trip reduction efforts and credit those reduced trips towards Stanford's attainment of the no net new commute trips standard. Stanford shall receive credit commensurate with the actual number of trips reduced outside the cordon due to Stanford's direct efforts, or the proportion of the cost of the program to which Stanford is contributing. A reduction of an off-campus trip may be recognized as long as at least one terminus for the trip is within the area shown on **Figure 7A.15-1**.[39] The County Planning Office will determine the appropriate trip credit and monitoring methodology for each program in which Stanford proposes to participate. Such proposals shall be submitted by Stanford to the County Planning Office for review, modification and potential approval. The proposals shall be presented to the Community Resource Group prior to any determination by the County Planning Office. Once the County Planning Office has accepted the proposal and the program implementation begins, the County Planning Office will identify, at Stanford's cost, the number of trips reduced outside the cordon and calculate a trip reduction credit for application toward attainment of the no net new commute trips standard, with the continuing requirement that Stanford provide evidence of its participation in the

[39] Please note this figure is identical to Figure 5.15-8 in the Draft EIR, and was not revised for Additional Housing Alternative A.



SOURCE: Stanford LBRE LUEP

Stanford 2018 General Use Permit . 160531

Figure 7A.15-1
Revised Cordon Credit Area

ongoing program in a manner that can be independently verified. The County reserves the right to further regulate Project-generated trips and the use of trip credits through the Conditions of Approval for the General Use Permit.

Funding of off-campus circulation infrastructure improvements may also qualify for trip credits if the improvements will enhance safety or increase mobility for pedestrians, bicyclists or transit users within the local impact area, and thereby remove vehicular trips from the local impact area. For example, funding roadway widening or modifications to add transit vehicle or bicycle lanes or to add signals to improve pedestrian or bicycle safety could qualify for trip credits under this approach if approved by the County. Any proposal for such credits shall be accompanied by substantial evidence demonstrating that the infrastructure project would remove vehicular trips from the local impact area. Once the County Planning Office has approved infrastructure improvement project for a trip reduction credit, the project has been implemented, and the trip reductions have been verified, the trip reduction credit will be factored into the County's conclusion regarding Stanford's annual compliance with the no net new commute trips standard in each subsequent year.

Each year, the County will report Stanford's trip credits in its annual monitoring report. The County will track and calculate trip reduction credits in a manner designed to ensure that credits benefit the three geographic sub-areas surrounding the Stanford campus (north, east, and south/southwest) in rough proportion to the 2018 General Use Permit trip assignment forecasted in the Draft EIR. Trip reduction credits with area-wide benefit will be tracked separately from trip reduction credits with sub-area geographic benefits.

6. The County Planning Office shall monitor the cordon counts using the procedures described above. If the cordon counts, as modified by trip reduction credits, exceed the baseline volume by 1% or more for any two out of three consecutive years, mitigation of impacts to intersections in the form of fair share payments will be required, implementing Stanford Community Plan Implementation Recommendation C(i)(9). Table 1A identifies the intersection impacts that could occur if the no net new commute trips standard is not achieved, and the physical improvements that would substantially reduce each impact.

   Upon the County's determination that the no net new commute trips standard has been exceeded by 1% or more in two out of three consecutive years, the County will require Stanford to make its fair share contribution toward improvements at adversely affected intersections and roadways based on all exceedances of the "no net new commute trips" standards.

   The County Planning Office will use the intersection improvement fees collected from Stanford as follows:

   a. The fees shall be used to fund the intersection improvements identified in Table 1A. The priority order for funding such intersection improvements will be determined by the County Planning Office in consultation with the affected jurisdictions. If the fees are used to fund an intersection improvement in another jurisdiction, the County will enter into an agreement with such jurisdiction to address the timing for the County to provide the funding, the timing for the relevant jurisdiction to complete the improvement, and any other matters that the County determines to be appropriate.

b. Substitute Mitigation: If the County Planning Office determines that it is not feasible to use the fees for the specified intersection improvements (e.g., it does not appear that there will be full funding for the improvements within a reasonable time; the public agencies with authority or jurisdiction over the improvement projects will not approve the projects), then the fees may be used to fund off-campus projects that encourage and improve the use of alternative transportation modes or otherwise reduce peak period traffic in the local impact area, including but not limited to transit improvements that would directly or indirectly benefit the local impact area. This fund also could be used for transportation improvements that increase safety and mobility for pedestrians, bicyclists and transit users provided there is substantial evidence demonstrating how the improvements would remove vehicular trips from the local impact area.

Mitigation Measure 7A.15-2(b): Stanford shall mitigate the transportation impacts of its additional development and population growth with respect to reverse-commute impacts through the contribution of fair share fees for the cost of improvements for adversely affected intersections specified in Table 2A (a subset of the adversely affected intersections specified in Table 1A), which funds shall be expended by the County to fund transportation mitigation efforts in the same manner as provided in Mitigation Measure 7A.15-2(a)(6)(a) and (b).

Significance after Mitigation: Significant and Unavoidable.

This mitigation would substantially reduce traffic congestion impacts to intersections; however, this is considered a significant and unavoidable impact because it is uncertain whether it would be feasible to improve some of the affected intersections if the No Net New Commute Trips standard is not achieved, if there are not sufficient additional funds to complete the intersection impacts, or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2018 Baseline with Additional Housing Alternative A conditions are located in other jurisdictions (i.e., other than County of Santa Clara, such as City of Palo Alto, Caltrans, etc.), and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. For these reasons, the impact would remain significant and unavoidable.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the proposed Project, the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are evaluated below. In all cases, these effects of mitigation are determined to be less than significant.

TABLE 2A
STUDY INTERSECTION REVERSE-COMMUTE MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE A

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alt. A	2035 Cumulative with Additional Housing Alt. A	Fair Share Contribution[a]
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X		22.8%
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair-share funding toward a second southbound left-turn lane	X	X	20.0%
19	Hanover St / Page Mill Rd – Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a second westbound left-turn lane, identified as an option in the Page Mill Expressway Corridor Study Report.		X	16.9%
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report.		X	13.9%
29	Foothill Expy / Hillview Ave	Santa Clara County	No feasible mitigation measure.		X	3.4%
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X	5.8%
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	Contribute fair share funding toward the addition of a second northbound and southbound left-turn lane.		X	19.3%
56	Alma St / Hamilton Ave	Palo Alto	Contribute fair share funding toward the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, by removing a portion of the parking.		X	3.3%
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements.	X	X	2.5%

NOTE:

[a] The fair-share contribution is estimated based on the total number of proposed Additional Housing Alternative A reverse-commute direction trips at the intersection divided by the difference between the total cumulative intersection volume and the existing intersection volume. The value presented in this table represents the maximum percentage of the AM and PM peak hours if both peak hours are impacted; the AM percentage if only the AM peak hour is impacted, and the PM percentage if only the PM peak hour is impacted. Additional calculations are provided in Appendix RCA. It should be noted that these percentages are projected based on Baseline and Cumulative projects known at this time, and are subject to change if new projects (i.e., projects not included in Baseline and/or Cumulative analysis scenarios) that would add volumes to the study intersections are approved prior to issuance of the first building permit authorized under the 2018 General Use Permit.

- **Intersection #2: Contribute fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report*.**

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #13: Contribute fair-share funding to the installation of a traffic signal at the unsignalized intersection of I-280 Southbound Off-Ramp / Page Mill Road.**

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and requires additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the bicycle StreetScore+ QOS, as it would remain unchanged at QOS 3.7. There is no pedestrian access at this intersection.

  It is noted that Santa Clara County's *Page Mill Expressway Corridor Study Report* describes improvements along the length of Page Mill Road from the I-280 Southbound Ramps to El Camino Real. The improvement concept at the I-280 Southbound Ramps intersection is a roundabout with a traffic signal at the I-280 Northbound Ramps intersection and a third eastbound and westbound through lane on Page Mill Road to the east of the I-280 Northbound Ramps intersection. The County would determine the ultimate improvement design and phasing for the corridor improvements. Additional Housing Alternative A's fair-share funding contribution identified for Intersection #13 may be applied toward a roundabout at the I-280 Southbound Ramps intersection if the County chooses, and the timing of this improvement would also be determined by the County.

- **Intersection #17: Contribute fair-share funding to a grade-separation improvement project, at the signalized intersection of Junipero Serra Boulevard – Foothill Expressway / Page Mill Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented).**

  For Additional Housing Alternative A, the impact at this intersection cannot be mitigated to a less-than-significant level with the mitigation measures identified for the proposed Project; instead, the above-described interchange would be needed. Although the configuration of this proposed interchange has yet to be determined, additional right-of-way would be required to construct this improvement. Additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  This mitigation differs from the mitigation under the proposed Project. For the proposed Project, the impact at this intersection would be reduced to a less-than-significant level with the following mitigation: Contribute fair share funding toward:

  (1) addition of a third through lane on Page Mill Road in the westbound direction (for a total of two left-turn lanes, three through lanes, and a right turn lane plus a bike lane);

  (2) addition of a receiving lane to westbound Page Mill Road (resulting in three lanes from Junipero Serra Boulevard approximately to Old Page Mill Road); and

  (3) installation of an overlap phase for northbound and southbound right-turning vehicles and widening of the southbound approach to two lanes between Page Mill Road and Stanford Avenue to align with the existing designated right-turn lane.[40]

  It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* to widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. The Tier 1 improvement is fully funded through Measure B, but conservatively is not anticipated to be in place by 2035. This was evaluated as a potential mitigation measure and was determined not to bring the impact to a less-than-significant level under 2018 Conditions.

  ***Impacts of Mitigation*:** With the exception of construction-related impacts, the mitigation would not have a substantial adverse effect on bicycle QOS, which would remain at QOS 3.5. Pedestrian QOS would improve from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 2 to 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

[40] The third improvement was identified as a mitigation measure in the Draft EIR. Two additional improvements have been added to ensure the impact is mitigated to a less-than-significant level under the assumption that Page Mill Road is four lanes, rather than six lanes as previously assumed.

- **Intersection #30: Contribute fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of-way would be required to construct this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 2 to 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #58: Contribute fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would reduce the impact, but not to a less-than-significant level. In addition, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection and remain unchanged on all other approaches while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on

the northbound and southbound approaches. The proposed mitigation measure would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

See **Table 7A.15-6** for mitigated LOS conditions.

Impact 7A.15-3: Implementation of Additional Housing Alternative A could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Additional Housing Alternative A conditions. (*Significant*)

Please note that only the freeway mainline segment impact analysis is provided for the Additional Housing Alternative A analysis. As described in Draft EIR page 5.15-58, freeway ramp queueing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions.

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Under 2018 Baseline with Additional Housing Alternative A Conditions, the following 6 freeway segments would meet the significance criteria, which is two more than under 2018 Baseline with Project Conditions:

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM and PM peak hours);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour);
  - South De Anza Boulevard to Saratoga Avenue (PM peak hour);
- Northbound I-280
  - Magdalena Avenue to El Monte Road (AM peak hour).
- Southbound I-280
  - El Monte Road to Magdalena Avenue (PM peak hour).

In addition, Additional Housing Alternative A would extend the significant impact to Northbound State Route 85 from Stevens Creek Boulevard to South De Anza Boulevard to both the AM and PM peak hours, while the proposed Project would only cause a significant impact in the AM peak hour.

There are limited options to widen these freeway segments due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 7A.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fair share fees paid by Stanford from exceeding the No Net New Commute Trips standard to

TABLE 7A.15-6
2018 BASELINE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Additional Housing Alternative A		Mitigation Measure	2018 Baseline With Additional Housing Alternative A (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**136.9** 22.1	**F** C+	See MM 7A.15-2(a) (Table 1A)	45.3 17.9	D B	LTS/SU
13	I-280 SB Ramps / Page Mill Road	Santa Clara County	LOS E (Warrant)	AM PM	**151.7** **85.9**	**F** **F**	**154.0** **89.2**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	37.2 42.3	D+ D	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**110.6** **113.0**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	70.3 59.2	E E+	LTS/SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	73.8 **95.1**	E **F**	See MM 7A.15-2(a) (Table 1A)	60.3 67.9	E E	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**56.3** **56.5**	**E+** **E+**	See MM 7A.15-2(a) (Table 1A)	55.2 **55.4**	**E+** **E+**	SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection;
SU = significant and unavoidable.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

alternative programs that reduce vehicular trips. Nevertheless, because it is uncertain whether the No Net New Commute Trips standard would be achieved, the freeway impacts under Additional Housing Alternative A would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.15-4: Implementation of Additional Housing Alternative A would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. Similar to the proposed Project, Additional Housing Alternative A does not propose infrastructure changes outside the Project site and, thus, would not interfere with the ability of transit agencies to modify or expand service.

Additional Housing Alternative A would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 7A.15-7**, Additional Housing Alternative A would not add substantial delays relative to the total route travel time to any of the transit routes assessed, although delays are sometimes higher than proposed Project delays. The additional delay would be fewer than 30 seconds on all but three of the routes, and fewer than 60 seconds on all but two of the routes. The longest-delay result, 91 seconds on the Dumbarton Express 1 eastbound in the PM, constitutes three percent of the total travel time on that route. Therefore, Additional Housing Alternative A's impact on transit services would be less than significant, as would the proposed Project.

Mitigation: None required.

Impact 7A.15-5: Implementation of Additional Housing Alternative A would not substantially increase intrusion by traffic in nearby neighborhoods. (*Less than Significant*)

Traffic impacts on residential streets were estimated using the Traffic Infusion on Residential Environment (TIRE) methodology, which empirically determines the potential impact on residential streets based on the premise that any increase in traffic that would cause an index increase of 0.1 or more would be noticeable to residents. The TIRE index is based on a logarithmic scale, and is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling, or playing. The TIRE indices values range from zero (representing the least noticeable effect on traffic) to five (representing the most severe effect).

TABLE 7A.15-7
BACKGROUND (2018) WITH ADDITIONAL HOUSING ALTERNATIVE A TRANSIT ROUTE DELAY[a]

Route		Direction	Peak Hour	Additional Route Average Delay (seconds)[b]	
				Proposed Project[c]	Additional Housing Alternative A
22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM	< 5.0	6.0
			PM	14.3	28.2
		Westbound	AM	10.9	12.9
			PM	7.0	10.6
35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
		Southbound	AM	< 5.0	< 5.0
			PM	< 5.0	5.1
89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM	< 5.0	< 5.0
			PM	< 5.0	22.1
		Southbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
102	South San Jose to Palo Alto	Northbound	AM	< 5.0	< 5.0
		Southbound	PM	7.1	24.3
104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0	71.3
		Westbound	AM	14.4	50.5
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM	< 5.0	< 5.0
			PM	16.0	31.6
		Westbound	AM	10.9	12.9
			PM	7.0	10.6
281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM	5.1	5.3
			PM	< 5.0	5.7
		Westbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
		Southbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
		Westbound	AM	< 5.0	13.2
			PM	< 5.0	13.6
DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM	< 5.0	18.7
			PM	9.3	91.0
		Westbound	AM	20.8	65.3
			PM	13.3	49.6
U	Fremont BART to Stanford Oval	Eastbound	PM	12.3	24.9
		Westbound	AM	< 5.0	18.6
E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM	< 5.0	< 5.0
			PM	5.3	6.6
		Westbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
		Westbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0

[a] Transit route delay is calculated by summing each transit route movements through the study intersections. Some movements may experience large increases or decreases in delay as a result of the analysis software (Traffix 8.0) redistributing green time for each phase.
[b] Additional Housing Alternative A was not considered to have a measureable change in overall transit route delay if the increase in travel time was less than five seconds or the travel time improved slightly (due to changes in signal timing, critical movement changes, etc.).
[c] Background (2018) With Proposed 2018 General Use Permit presents the results as it was included in the Draft EIR. These results are provided for comparison purposes only.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Similar to what was analyzed for the proposed Project, two neighborhoods in Palo Alto (College Terrace and Crescent Park) were identified as locations where neighborhood traffic impacts might occur with the proposed growth assuming the build-out of Additional Housing Alternative A for the following reasons:

- **College Terrace** – The neighborhood lies along the southern boundary of the campus and shares access with Stanford Avenue, which is a primary access route to the campus. Even though the traffic calming measures instituted in this neighborhood appear to have been effective, there remains a concern that there are routes through the neighborhood that drivers from Stanford might use to travel between Stanford Avenue and California Avenue to access Page Mill Road or El Camino Real.

- **Crescent Park** – The neighborhood lies along University Avenue, which is a major access route to regional roadways such as US 101 and SR 84 (Dumbarton Bridge), and is a road used by some drivers accessing Stanford. There is existing congestion on the corridor that includes spillover traffic to parallel roadways such as Hamilton Avenue.

TIRE Indices on Local Streets

Given that travel patterns throughout and surrounding the Stanford campus may change with Additional Housing Alternative A, variations to the methodology used for the proposed Project were used to calculate the total number of daily trips that may divert through the College Terrace and Crescent Park neighborhoods. Separate approaches were used to estimate the number of diverted daily trips for the two neighborhoods. For the College Terrace neighborhood, a ratio was developed between the number of peak hour trips accessing the University via Bowdoin Street and the total number of daily trips under the proposed Project conditions. This ratio was applied to the new number of peak hour trips using Bowdoin Avenue to determine the new number of daily trips that would potentially cut through the College Terrace neighborhood. This method was also applied to vehicle trips along University Avenue to estimate the number of daily trips that would potentially cut through the Crescent Park neighborhood.

College Terrace TIRE Analysis

As shown in **Table 7A.15-8**, TIRE indices for the local streets serving Stanford in the College Terrace neighborhood currently range from 2.6 to 3.1. Applying the ratio described above yields an estimate that 2,268 daily vehicles would use Bowdoin Street to access Stanford University for Additional Housing Alternative A.

Many of the daily trips that access the Stanford campus at Bowdoin Street do not pass through the College Terrace neighborhood, as there is a barrier at the entrance to the College Terrace neighborhood at Bowdoin Street, and all vehicles entering or exiting the campus at Bowdoin Street must also use Stanford Avenue. Vehicles traveling to or from the campus by way of the portion of Stanford Avenue that is to the west of Bowdoin Street do not pass through the College Terrace neighborhood. Vehicles traveling to or from the campus by way of the portion of Stanford Avenue that is to the east of Bowdoin Street can continue on Stanford Avenue directly to El Camino Real. These vehicles also do not pass through the College Terrace neighborhood. The only vehicles that travel through the College Terrace neighborhood are those that zig zag through the neighborhood by taking College Avenue or California Avenue to and from El Camino Real, or by taking Hanover Street to or from Page Mill Road. Vehicles cannot travel directly from Stanford Avenue to

Page Mill Road on Hanover Street; there is a barrier at the intersection of California Avenue and Hanover Street that prevents through traffic.

TABLE 7A.15-8
COLLEGE TERRACE NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Volume that Equates to 0.1 Change[a]	Project Daily Trips[b]	Additional Housing Alt. A Trips[b]	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index				
Columbia Street, between College Avenue and California Avenue	2	640	2.8	140	57	68	No
Hanover Street, between Stanford Avenue and College Avenue	2	1,160	3.1	290	76	91	No
Harvard Street, between Stanford Avenue and College Avenue	2	430	2.6	97	28	34	No
Oberlin Street, between Stanford Avenue and College Avenue	2	850	2.9	170	55	66	No
Princeton Street, between College Avenue and California Avenue	2	610	2.8	140	54	65	No
Cornell Street, between College Avenue and California Avenue	2	370	2.6	97	33	39	No

NOTES:
[a] Minimum daily traffic volume increase to produce an impact.
[b] Assumes 20% of the added daily Stanford traffic east of Bowdoin Street on Stanford Avenue.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Morning and afternoon peak period turning movement counts collected at the Bowdoin Street / Stanford Avenue intersection were used to estimate trip distribution along Stanford Avenue. Of the 2,268 additional daily trips accessing the campus at Bowdoin Street, it is estimated that 762 daily trips would travel on Stanford Avenue to the east of Bowdoin Street, thereby having the potential to pass through the College Terrace neighborhood.

Existing daily traffic volumes collected throughout the College Terrace neighborhood where Stanford traffic may use neighborhood streets were used to estimate trip distribution throughout College Terrace neighborhood. Due to the existing street closures and traffic calming devices, relatively few drivers are likely to choose to negotiate the circuitous route, as well as multiple stop signs and speed humps, to pass through the neighborhood to access El Camino Real; the alternative (Stanford Avenue) is a direct route to El Camino Real with fewer stops. Similarly, it is unlikely that a large number of drivers would choose to travel from Stanford Avenue to Page Mill Road through the College Terrace neighborhood given that multiple turns and out-of-way travel would be needed. For example, if a driver were to leave the campus at Bowdoin Street, they would need to turn left on Stanford Avenue, right on Hanover Street, right on College Avenue,

left on Columbia Street and left on California Avenue to access Page Mill Road. The other options would be to use Stanford Avenue to access Peter Coutts to Junipero Serra Boulevard, or El Camino Real to access Page Mill Road.

While the traffic calming and circuitous routing minimizes the number of drivers electing to cut through the neighborhood, the analysis assumed (based on professional judgment and knowledge of the neighborhood traffic calming and routing) that approximately 20 percent of drivers who travel to and from the Stanford gateway via the east of Bowdoin Street might elect to pass through the neighborhood streets. Because the TIRE index is based on daily traffic volumes, and the greatest time savings for drivers cutting through the neighborhood would be during the morning or evening peak periods when El Camino Real, Page Mill Road and Junipero Serra Boulevard are congested, the 20 percent assumption is considered conservative.

While it is unlikely that even 20 percent of the added daily Stanford traffic traveling east of Bowdoin Street on Stanford Avenue would travel through the neighborhood, this percentage was used to demonstrate a conservatively-high analysis scenario. Additional Housing Alternative A trip estimates along Oberlin Street, Harvard Street, Hanover Street, Cornell Street, Princeton Street, and Columbia Street were distributed based on the relative existing daily volumes on these roadways. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in Table 7A.15-8, Additional Housing Alternative A would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact on local streets, although higher than the proposed Project impact, would be less than significant, the same as the result of the analysis of the proposed 2018 General Use Permit.

Crescent Park TIRE Analysis

The percentage of trips using University Avenue that would be likely to divert to neighborhood roadways when passing through Downtown Palo Alto was calculated. The potential diversion of this volume to parallel routes within the Crescent Park neighborhood was based on an analysis of the relative existing daily traffic volumes on University Avenue, Lytton Avenue, and Hamilton Avenue for four different segments: east of Middlefield Road, west of Lincoln Avenue, east of Lincoln Avenue, and west of Woodland Avenue. The existing daily traffic volumes along each roadway in each segment were used to estimate potential daily trip distributions. For example, if the Stanford 2018 General Use Permit is estimated to contribute 15 trips on University Avenue, while University Avenue has an existing 100 daily trips and Hamilton Avenue has an existing 50 trips, then 10 additional Stanford trips would be assumed to use University Avenue and five trips would be assumed to use Hamilton Avenue. The estimated potential daily trip distributions of Additional Housing Alternative A trips in Crescent Park neighborhood are shown in **Table 7A.15-9**. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in **Table 7A.15-10**, TIRE indices for the local streets serving Stanford in the Crescent Park neighborhood currently range from 3.5 to 3.7, and Additional Housing Alternative A would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact on local streets, although higher than the proposed Project impact would be less than significant, the same as the result of the analysis of the proposed 2018 General Use Permit.

TABLE 7A.15-9
CRESCENT PARK NEIGHBORHOOD TRIP DISTRIBUTION CALCULATIONS

Roadway Description		Average Daily Traffic	Percent of Total Volumes	Estimated Daily Trips
Cordon 1	University Avenue East of Middlefield Road	20,640	71%	878
	Lytton Avenue East of Middlefield	2,940	10%	125
	Hamilton Avenue East of Middlefield Road	5,580	19%	238
	Total for Cordon 1	***29,160***	***100%***	***1,241***
Cordon 2	University Avenue West of Lincoln Avenue	19,500	84%	1,043
	Hamilton Avenue West of Lincoln Avenue	3,700	16%	198
	Total for Cordon 2	***23,200***	***100%***	***1,241***
Cordon 3	University Avenue East of Lincoln Avenue	20,920	86%	1,068
	Hamilton Avenue East of Lincoln Avenue	3,400	14%	173
	Total for Cordon 3	***24,320***	***100%***	***1,241***
Cordon 4	University Avenue Wes of Woodland Avenue	24,890	100%	1,241
	Total for Cordon 4	***24,890***	***100%***	***1,241***

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

TABLE 7A.15-10
CRESCENT PARK NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Volume that Equates to 0.1 Change[a]	Project Daily Trips	Additional Housing Alt. A Trips	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index				
Lytton Avenue, between Middlefield Road and Fulton Street	2	2,940	3.5	825	76	125	No
Hamilton Avenue, between Middlefield Road and Fulton Street	2	5,580	3.7	1,250	145	237	No
Hamilton Avenue, between Hamilton Court and Lincoln Avenue	2	3,700	3.6	1,025	121	198	No
Hamilton Avenue, between Lincoln Avenue and Crescent Drive	2	3,400	3.5	825	106	173	No

NOTE:

[a] Minimum daily traffic volume increase to produce an impact.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

It should be noted that since the TIRE indices are based on the effect of Additional Housing Alternative A as a percentage of total traffic, that Alternative's A effect on cumulative traffic conditions would be even less, and similarly less than significant.

Mitigation: None required.

Impact 7A.15-6: Implementation of Additional Housing Alternative A would not substantially increase hazards due to a design feature or incompatible uses. (*Less than Significant*)

The potential safety impacts of Additional Housing Alternative A are evaluated based on whether any identified intersection mitigation measures would cause adverse safety effects for vehicles, transit, pedestrians, or bicyclists, and if Additional Housing Alternative A would introduce incompatible uses (i.e., types of vehicles that differ from those currently on area roadways). The intersection mitigation measures would be constructed according to the design standards of the relevant jurisdiction/agency (i.e., where the intersection is located), which conform to industry standards for roadway and intersection design and operations. In addition, the secondary effects of the intersection mitigations on pedestrians and bicyclists are described for each mitigation measure (Impact 7A.15-2, above, and Impact 7A.15-9, below). Lastly, the mix of vehicles on area roadways (trucks, autos, etc.) would not materially change from existing conditions. Therefore, the mitigation measures and increased traffic would not cause adverse safety effects for vehicles, transit, pedestrians or bicyclists under Additional Housing Alternative A and cumulative conditions, and impact of Additional Housing Alternative A on safety is less-than-significant.

It is also noted that Stanford's proposed mitigation approach aims to eliminate congestion impacts and the need for the intersection mitigation measures. The approach includes a combination of trip reduction measures for trips to and from the Stanford campus, and trip reduction measures for trips outside the Project site within the impact area, incorporating both infrastructure projects and programs supporting non-auto modes. If successful, this approach would avoid the need to construct any of the intersection capacity mitigations.

Mitigation: None required.

Impact 7A.15-7: Implementation of Additional Housing Alternative A would not result in inadequate emergency access. (*Less than Significant*)

Emergency access can be impeded as a result of the construction of physical features that can block emergency access routes or make them more circuitous, or as a result of high levels of congestion that lengthen the response time of emergency providers. Additional Housing Alternative A would not result in any infrastructure changes outside the Project site, and thus would not create fixed physical barriers to, or impede, emergency access. The Additional Housing Alternative A traffic analyses (Impact 7A.15-2, above, and Impact 7A.15-9, below) indicate significant impacts (increased congestion/delays) at intersections in both the 2018 with

Additional Housing Alternative A and 2035 Cumulative with Additional Housing Alternative A conditions. As described in Impacts 7A.15-2 and Impact 7A.15-9, Additional Housing Alternative A would incrementally increase congestion/delays compared to the proposed Project, but similar to the Project, identifies intersection capacity mitigations, if feasible. Emergency responders are charged with developing fastest-response travel routes and assessing traffic conditions and developing alternate routes in real time to provide emergency services. Therefore, the identified significant impacts at area intersections would not result in inadequate emergency access within the traffic study area, and the impact on emergency access under Additional Housing Alternative A and cumulative conditions, and although effects would be incrementally greater than the proposed Project's impact, would be less-than-significant.

Mitigation: None required.

Impact 7A.15-8: Implementation of Additional Housing Alternative A would not conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

A significant impact to bicycle or pedestrian facilities could occur when Additional Housing Alternative A would create a hazardous condition that currently does not exist for pedestrians or bicyclists, or conflicts with planned facilities or local agency policies regarding bicycle and pedestrian facilities. Additional Housing Alternative A would not result in any infrastructure changes outside the Project site and would preclude implementation of planned bicycle or pedestrian facilities, and thus, would not create hazardous conditions where none exist today, nor conflict with planned facilities or local agency policies.

However, several intersection capacity mitigation measures are identified (for Impact 7A.15-2, above, and Impact 7A.15-9, below). Therefore, the analysis of potential impacts also focuses on the proposed mitigations, as these could be effects of Additional Housing Alternative A if they are constructed. The analysis of each mitigation location also includes the effect of the daily traffic volume with the additional trips generated by Additional Housing Alternative A. The analysis found that the identified intersection improvements would not substantially affect quality of service for pedestrians and bicyclists (i.e., no substantial worsening of QOS indices) in all but two cases. At one Cumulative (2035) mitigation location, Middlefield Road / Marsh Road (Intersection #59), the bicycle quality of service would decrease from QOS 2.7 to QOS 3 (the same result as under the Cumulative (2035) with Project Conditions). At Middlefield Road / Charleston Road (Intersection #69), the pedestrian quality of service would decrease from QOS 2 to QOS 2.5. This is a new quality of service result for the Cumulative (2035) with Additional Housing Alternative A Conditions that would not occur under the Cumulative (2035) with Project Conditions.

While the rest of the traffic mitigation measures do not change the quality of service index at the mitigation location, in some cases the mitigations do add another vehicle lane to cross or navigate as a bicyclist. However, these changes do not affect the QOS rating because it is already at 4 (the worst rating). In several cases, the mitigation measures may result in a slight improvement for

bicyclists by removing a right-turn conflict zone due to re-striping. As noted in the traffic mitigation discussions, the implementation of the traffic mitigation measures would ultimately be the decision of the responsible jurisdiction, and considerations for bicyclist and pedestrian comfort and convenience may enter into those decisions, resulting in a modified improvement project that adds or enhances pedestrian and/or bicycle facilities, or rejection of the improvement project.

In some cases, the mitigations would add another vehicle lane to cross or navigate as a bicyclist. However, these changes would not affect the QOS rating because it is already at 4 (the worst rating). As noted in the traffic mitigation discussions, the implementation of the mitigation measures would ultimately be the decision of the responsible jurisdiction, and considerations for bicyclist and pedestrian comfort and convenience may enter into those decisions, resulting in a modified improvement that adds or enhances pedestrian and/or bicycle facilities, or rejection of the identified mitigation measure.

In addition, assessment of the bicycle facility capacity to serve future growth in bicycle commuters to the campus (based on existing bicycle counts at the campus gateways and estimates of future growth to 2018 and 2035 under the proposed 2018 General Use Permit) shows that the carrying capacities of bicycle paths and lanes in the various "bike shed" areas surrounding the campus exceed the estimated future growth in bicycle volumes.

For the above reasons, the impact of Additional Housing Alternative A on pedestrian and bicycle facilities, under Additional Housing Alternative A and cumulative conditions, and although effects would be incrementally greater than the proposed Project's impact, would be less than significant.

Separate from the above analysis, it is noted that under Additional Housing Alternative A, like the proposed Project, Stanford would construct improvements on its lands in unincorporated Santa Clara County that have been identified by the Palo Alto Unified School District (PAUSD) and the City of Palo Alto as the Suggested Routes to Schools shown on the Walkabout Maps for Nixon and Escondido Elementary Schools. These improvements would benefit both pedestrian and bicycle circulation in the immediate area of both schools. Circulation improvements on Stanford lands in unincorporated Santa Clara County, in and around Nixon Elementary School, could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, and wayfinding signs. Circulation improvements in and around Escondido Elementary School similarly could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, additional traffic control. Specific improvements on Stanford property could include an enhanced mid-block crosswalk on Escondido Road.

Mitigation: None required.

Cumulative Impacts

2035 Baseline With Additional Housing Alternative A Conditions

Impact 7A.15-9: Implementation of Additional Housing Alternative A, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Additional Housing Alternative A conditions. (*Significant*)

The results for the Cumulative (2035) No Project and 2035 Cumulative With Proposed Project conditions have been updated since publication of the Draft EIR to correct the assumed lane configuration on Page Mill Road under cumulative conditions. Modeling conducted for the Draft EIR assumed Page Mill Road would have six travel lanes based on VTA's 2040 traffic model. Subsequently, VTA staff indicated that inclusion of the 6-lane configuration had been an error on the part of VTA.[41] The updated results are based on modeling that assumes no change to the existing 4-lane configuration for Page Mill Road.[42]

Cumulative impacts associated with Additional Housing Alternative A are identified by comparing 2035 Cumulative (no project) to 2035 Cumulative with Additional Housing Alternative A Conditions. Significant impacts are identified based on the applicable impact criteria, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay and critical V/C ratios for intersections operating unacceptably. The results of the LOS analysis are summarized in **Table 7A.15-11**. The results for 2035 Cumulative No Project and 2035 Cumulative With Proposed Project (2018 General Use Permit) conditions are included in Table 7A.15-11 for comparison purposes.

Generally, at the study intersections located closest to the campus, Additional Housing Alternative A would increase congestion compared to the proposed Project. At the study intersections located farther from the campus, this alternative would reduce congestion by a small degree compared to the proposed Project because peak-hour, peak-direction residence-based trips are assumed to start and end at destinations closer to the Stanford campus as compared to peak-hour, peak-direction commute trips. When compared to the proposed Project, Additional Housing Alternative A would add approximately 200 to 220 peak hour trips to intersections directly adjacent to the campus along El Camino Real and between 30 to 130 peak hour trips to intersections that border the campus along Sand Hill Road and Junipero Serra Boulevard. Overall, Additional Housing Alternative A would not reduce significant effects of the proposed 2018 General Use Permit under 2035 conditions.

[41] Email dated 10/3/17 from George Naylor (Santa Clara County VTA) to Ananth Prasad (Santa Clara County Roads and Airports), forwarded via Dave Rader (Santa Clara County Planning Department) to Ellen Poling (Fehr & Peers) on 10/19/18.

[42] The updated results will also be reflected in the forthcoming Response to Comments Document.

TABLE 7A.15-11
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
1	I-280 NB On-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.3 12.6	B+ B	10.1 13.7	B+ B	0.015 0.032	-0.2 1.2	10.1 13.7	B+ B	0.026 0.031	-0.3 1.1
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**155.2** 18.6	**F** B-	**0.038** 0.021	**19.2** 0.2	**154.7** 19.4	**F** B-	**0.037** 0.035	**18.8** 1.1
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	37.9 21.5	D+ C+	49.6 22.3	D C+	0.037 0.032	18.3 1.4	47.5 22.2	D C+	0.031 0.031	15.4 1.3
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	19.4 30.1	B- C	19.6 29.8	B- C	0.036 0.031	0.5 -0.2	19.7 29.6	B- C	0.030 0.030	0.4 -0.2
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	17.4 18.9	B B-	17.4 18.6	B B-	0.036 0.032	0.3 0.0	17.3 18.6	B B-	0.030 0.031	0.3 0.0
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	13.3 14.6	B B	13.3 14.5	B B	0.000 0.000	0.0 0.0	13.3 14.5	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	51.3 46.2	D- D	52.8 47.2	D- D	0.030 0.038	2.1 1.7	53.9 47.4	D- D	0.039 0.035	3.5 1.4
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.5 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.1 0.1	10.4 3.9	B+ A	0.029 0.032	0.1 0.2
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	24.3 29.4	C C	25.4 30.3	C C	0.028 0.022	1.7 0.9	24.7 29.5	C C	0.030 0.011	1.2 2.2
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.7 26.8	C+ C	20.8 27.4	C+ C	0.009 0.017	0.4 0.7	20.6 27.1	C+ C	0.020 0.028	0.4 0.6
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	25.3 31.7	C C	26.0 32.3	C C-	0.013 0.012	1.3 0.9	27.3 33.3	C C-	0.033 0.021	3.4 1.7
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	43.8 39.8	D D	43.6 40.3	D D	0.019 0.013	-3.1 0.6	43.8 40.5	D D	0.024 0.022	-2.7 1.3
13	I-280 SB Ramps / Page Mill Rd**	Santa Clara County	LOS E (warrant)	AM PM	37.0 44.6	D+ D	37.2 45.0	D+ D	0.003 0.003	0.3 0.2	37.3 44.7	D+ D	0.003 0.000	0.3 0.0
14	I-280 NB Ramps / Page Mill Rd**	Santa Clara County	LOS E (warrant)	AM PM	15.2 12.4	B B	14.5 12.5	B B	0.005 0.004	0.6 0.7	15.2 12.7	B B	0.005 0.007	0.6 1.2
15	Deer Creek Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	17.5 11.5	B B+	19.1 11.8	B- B+	0.026 0.021	2.7 0.1	19.1 11.9	B- B+	0.028 0.033	2.8 0.2
16	Coyote Hill Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	8.9 8.5	A A	9.8 8.9	A A	0.014 0.021	0.0 -0.1	9.8 9.0	A A	0.028 0.033	0.0 -0.2
17	Junipero Serra Blvd - Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**186.9** **175.2**	**F** **F**	**0.028** **0.044**	**4.5** **27.8**	**196.8** **178.3**	**F** **F**	**0.067** **0.053**	**19.5** **30.6**

TABLE 7A.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
18	Peter Coutts / Page Mill Rd	Santa Clara County	LOS E	AM PM	22.3 30.5	C+ C	22.9 30.8	C+ C	0.020 0.015	0.8 0.0	23.7 31.7	C C	0.035 0.030	1.7 0.9
19	Hanover St / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**92.1** 52.8	**F** D-	**0.025** 0.018	**11.2** 0.6	**96.0** 62.4	**F** E	**0.053** 0.134	**17.8** 14.1
20	El Camino Real / Page Mill Rd - Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**84.9** **90.2**	**F** **F**	**0.047** **0.035**	**13.2** **11.0**	**91.6** **98.5**	**F** **F**	**0.105** **0.080**	**38.3** **26.1**
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.6** **103.6**	**F** **F**	**0.014** **0.012**	**4.7** **3.1**	**125.5** **103.2**	**F** **F**	**0.016** **0.018**	**4.3** **2.1**
22	Oregon Expy / West Bayshore Rd	Santa Clara County	LOS E	AM PM	23.4 20.8	C C+	23.4 21.0	C C+	0.003 0.008	0.0 0.1	23.5 21.2	C C+	0.012 0.017	0.1 0.6
23	I-280 SB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	10.5 2.1	E C	42.7 16.9	E C	N/A	N/A	47.4 16.8	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	26.7 29.1	D D	27.8 32.5	D D	N/A	N/A	28.3 32.6	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Rd	Menlo Park	LOS D	AM PM	48.1 50.6	D D	51.6 52.8	D- D-	0.049 0.029	4.6 1.7	51.6 52.8	D- D-	0.046 0.030	4.3 1.7
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	30.1 44.1	C D	32.5 50.3	C- D	0.009 0.043	1.5 8.6	34.5 49.9	C- D	0.041 0.037	6.7 6.7
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14 17.8	B B	14.4 19.5	B B-	0.020 0.037	0.7 2.8	14.7 19.6	B B-	0.041 0.051	1.2 2.5
28	Junipero Serra Blvd / Stanford Ave	Santa Clara County	LOS E	AM PM	20.6 24.9	C+ C	22.4 29.9	C+ C	0.061 0.084	2.5 6.8	24.4 32.3	C C-	0.095 0.111	5.1 9.4
29	Foothill Expy / Hillview Ave	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**135.0** 64.2	**F** E	**0.024** 0.015	**16.1** 9.0	**132.1** 63.3	**F** E	**0.036** 0.013	**11.2** 7.7
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**201.2** **208.9**	**F** **F**	**0.016** **0.095**	**10.4** **18.2**	**200.5** **207.9**	**F** **F**	**0.015** **0.092**	**9.3** **15.9**
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	43.2 **171.0**	D **F**	0.016 **0.021**	6.7 **8.1**	42.0 **169.7**	D **F**	0.012 **0.017**	4.9 **6.5**
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**149.3** **137.9**	**F** **F**	**0.014** 0.004	**13.5** 1.9	**147.6** **136.9**	**F** **F**	**0.011** 0.003	**10.3** 1.0
33	Foothill Expy / Springer Road-Magdalena Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.9** **154.4**	**F** **F**	**0.014** **0.010**	**4.8** **5.1**	**131.6** **154.7**	**F** **F**	**0.011** **0.009**	**4.3** **5.5**
34	Bowdoin St / Stanford Ave*	Palo Alto	LOS E (warrant)	AM PM	16.7 25.8	C D	22.8 43.2	C E	N/A	N/A	25.7 **55.4**	D **F**	N/A	N/A

TABLE 7A.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
35	Arboretum Rd / Quarry Rd	Palo Alto	LOS D	AM PM	46.8 43.3	D D	47.5 44.2	D D	0.040 0.039	1.3 1.8	48.4 45.4	D D	0.079 0.074	3.3 3.6
36	Arboretum Rd / Palm Dr	Palo Alto	LOS D	AM PM	31 31.1	C C	32.4 32.5	C- C-	0.080 0.049	2.1 2.5	32.9 33.7	C- C-	0.092 0.077	2.9 4.0
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.4 **92.9**	D **F**	0.007 **0.015**	1.4 **5.5**	45.8 **92.5**	D **F**	0.010 **0.013**	2.2 **4.9**
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 57.4	D- **E+**	0.017 **0.015**	1.9 **2.7**	54.0 **57.2**	D- **E+**	0.014 **0.014**	1.5 **2.4**
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	34.4 39.0	C- D+	34.1 38.9	C- D+	0.018 0.017	-0.2 0.0	34.2 38.9	C- D+	0.015 0.015	-0.2 0.0
40	El Camino Real / Santa Cruz Ave	Menlo Park	LOS D	AM PM	26.8 35.5	C D+	26.5 35.5	C D+	0.018 0.010	-0.1 0.0	26.7 35.6	C D+	0.015 0.014	-0.1 0.0
41	El Camino Real / Ravenswood Rd	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.7 **65.8**	D **E**	0.008 **0.020**	1.0 **3.8**	48.9 **66.3**	D **E**	0.015 **0.021**	1.9 **4.1**
42	El Camino Real / Roble Ave	Menlo Park	LOS D	AM PM	12.8 15.3	B B	12.7 15.2	B B	0.006 0.009	-0.1 -0.1	12.7 15.1	B B	0.010 0.012	-0.1 -0.2
43	El Camino Real / Middle Ave	Menlo Park	LOS D	AM PM	25.1 28.5	C C	24.9 28.3	C C	0.014 0.009	-0.2 0.1	24.9 28.4	C C	0.013 0.012	-0.2 0.1
44	El Camino Real / Cambridge Ave	Menlo Park	LOS D	AM PM	15.2 24.8	B C	15.0 24.8	B C	0.014 0.009	-0.2 0.2	15.0 24.8	B C	0.013 0.012	-0.2 0.2
45	El Camino Real / Quarry Rd	Palo Alto	LOS D	AM PM	11.9 33	B+ C-	13.3 34.8	B C-	0.029 0.032	1.6 2.7	14.0 36.0	B D+	0.036 0.052	2.4 4.6
46	El Camino Real (SB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	21 22.7	C+ C+	20.7 22.5	C+ C+	0.016 0.031	-0.1 0.0	20.6 22.6	C+ C+	0.034 0.043	-0.1 0.5
47	El Camino Real (NB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	27.3 25.2	C C	28.6 26.1	C C	0.008 0.016	0.5 0.7	28.6 26.6	C C	-0.003 0.005	-0.4 0.1
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	60.4 **82.2**	E **F**	0.032 **0.059**	5.2 **20.0**	63.0 **90.1**	E **F**	0.065 **0.099**	11.8 **35.4**
49	El Camino Real / Churchill Ave	Palo Alto	LOS D	AM PM	25.4 26.7	C C	25.4 26.6	C C	0.017 0.018	0.1 0.1	25.4 26.9	C C	0.039 0.043	0.4 0.5
50	El Camino Real / Serra St	Palo Alto	LOS D	AM PM	24.6 29.3	C C	28.3 36.1	C D+	0.082 0.111	6.1 10.7	34.4 47.1	C- D	0.181 0.219	13.6 29.3
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	31.1 32.2	C C-	31.7 34.7	C C-	0.033 0.054	1.0 3.9	32.2 36.3	C- D+	0.074 0.082	1.6 6.4

TABLE 7A.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	22.8 27.8	C+ C	22.1 27.5	C+ C	0.029 0.031	-0.4 0.0	21.8 27.5	C+ C	0.038 0.046	-0.6 0.0
53	El Camino Real / Arastradero Rd - Charleston Rd	Palo Alto (SC CMP)	LOS E	AM PM	67.1 68.7	E E	70.2 70.3	E E	0.020 0.019	5.5 3.8	71.6 70.8	E E	0.029 0.024	8.1 4.8
54	El Camino Real / San Antonio Rd	Mountain View (SC CMP)	LOS E	AM PM	60.8 55.6	E E+	61.3 55.7	E E+	0.008 0.007	0.8 0.0	61.2 55.7	E E+	0.007 0.007	0.7 0.0
55	Alma St / Lytton Ave	Palo Alto	LOS D	AM PM	28.2 25.9	C C	30.9 27.1	C C	0.017 0.015	4.1 1.9	32.1 28.4	C- C	0.026 0.029	6.1 3.8
56	Alma St / Hamilton Ave	Palo Alto	LOS D	AM PM	10.2 57.7	B+ E+	10.4 **60.0**	B+ **E**	0.007 **0.012**	0.3 **5.0**	10.6 **63.6**	B+ **E**	0.014 **0.028**	0.6 **11.9**
57	Alma St / Churchill Ave	Palo Alto	LOS D	AM PM	32.4 **59.2**	C- **E+**	32.5 **59.8**	C- **E+**	0.005 **0.006**	0.2 **1.0**	32.8 **60.4**	C- **E**	0.007 **0.010**	0.6 **2.0**
58	Alma St / Charleston Rd	Palo Alto	LOS D	AM PM	**123.4** **121.5**	**F** **F**	**127.3** **126.7**	**F** **F**	**0.009** **0.017**	**3.9** **6.6**	**130.0** **129.4**	**F** **F**	**0.018** **0.024**	**6.9** **9.5**
59	Middlefield Rd / Marsh Rd	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.7** **77.4**	**E-** **E-**	**0.012** **0.000**	**4.6** **0.0**	**79.7** **77.5**	**E-** **E-**	**0.012** **0.000**	**4.6** **0.0**
60	Middlefield Rd / Ravenswood Ave	Menlo Park	LOS D	AM PM	49.3 45.3	D D	51.0 46.7	D D	0.011 0.012	2.1 1.9	51.4 47.4	D- D	0.013 0.017	2.6 2.8
61	Middlefield Rd / Ringwood Ave	Menlo Park	LOS D	AM PM	43.2 52.6	D D-	43.4 52.9	D D-	0.004 0.006	0.2 0.4	43.6 53.3	D D-	0.010 0.012	0.6 0.8
62	Middlefield Rd / Willow Rd	Menlo Park	LOS D	AM PM	50.0 53.0	D D-	50.2 53.4	D D-	0.000 0.006	0.0 0.5	50.2 53.6	D D-	0.000 0.009	0.0 0.8
63	Middlefield Rd / Lytton Ave	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.1 **70.1**	D- **E**	0.018 **0.017**	2.1 **4.4**	51.0 **70.1**	D **E**	0.017 **0.017**	2.0 **4.5**
64	Middlefield Rd / University Ave	Palo Alto	LOS D	AM PM	35.1 39.4	D+ D	35.6 40.8	D+ D	0.019 0.031	0.5 2.0	35.7 40.8	D+ D	0.018 0.031	0.5 2.0
65	Middlefield Rd / Hamilton Ave	Palo Alto	LOS D	AM PM	10.5 10.8	B+ B+	10.6 10.9	B+ B+	0.005 0.007	0.1 0.1	10.5 11.0	B+ B+	0.005 0.010	0.0 0.2
66	Middlefield Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**59.4** **72.9**	**E+** **E**	**0.030** **0.025**	**5.8** **6.4**	**58.8** **72.8**	**E+** **E**	**0.029** **0.024**	**5.1** **6.2**
67	Saint Francis Dr / Embarcadero Rd	Palo Alto	LOS D	AM PM	23.0 19.3	C+ B-	23.0 19.1	C+ B-	0.015 0.014	0.2 -0.1	23.0 19.1	C+ B-	0.013 0.013	0.2 -0.1
68	E. Bayshore Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	**98.5** **77.7**	**F** **E-**	**99.0** **78.7**	**F** **E-**	**0.006** **0.004**	**0.5** **0.9**	**100.0** **79.3**	**F** **E-**	**0.009** **0.005**	**1.7** **1.4**

TABLE 7A.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	**58.0** **67.7**	**E+** **E**	**58.3** **68.5**	**E+** **E**	**0.004** **0.007**	**0.4** **1.6**	**58.5** **69.8**	**E+** **E**	**0.004** **0.017**	**0.3** **4.1**
70	US 101 SB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	**77.3** **78.0**	**E-** **E-**	**77.2** **77.9**	**E-** **E-**	**0.000** **0.000**	**0.0** **0.0**	**77.2** **77.9**	**E-** **E-**	**0.000** **0.000**	**0.0** **0.0**
71	US 101 NB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	23.2 41.1	C D	23.2 41.1	C D	0.000 0.000	0.0 0.0	24.9 46.0	C D	0.018 0.021	2.9 7.4
72	Bay Rd / Willow Rd	Menlo Park	LOS D	AM PM	19.7 11.3	B- B+	19.7 11.3	B- B+	0.008 0.006	0.1 0.1	19.8 11.3	B- B+	0.007 0.008	0.1 0.1
73	Newbridge St / Willow Rd	Menlo Park	LOS D	AM PM	42.7 53.6	D D-	42.7 53.9	D D-	0.005 0.004	0.1 0.6	42.7 54.1	D D-	0.006 0.006	0.1 1.0
74	O'Brien Dr / Willow Rd	Menlo Park	LOS D	AM PM	19.4 20.1	B- C+	19.4 20.0	B- C+	0.003 0.004	0.0 0.0	19.4 20.0	B- C+	0.005 0.005	0.1 0.0
75	Hamilton Ave / Willow Rd	Menlo Park	LOS D	AM PM	41.3 40.9	D D	42.0 41.1	D D	0.005 0.004	1.2 0.3	42.0 41.2	D D	0.006 0.006	1.3 0.5
76	Bayfront Expy / Willow Rd	Menlo Park (SM CMP)	LOS F	AM PM	51.1 64.9	D- E	51.1 65.3	D- E	0.000 0.004	0.0 0.6	51.0 65.4	D- E	0.000 0.004	0.0 0.7
77	Woodland Ave / University Ave	East Palo Alto	LOS D	AM PM	**71.7** **66.1**	**E** **E**	**72.7** **66.4**	**E** **E**	**0.000** **0.006**	**0.0** **0.9**	**72.9** **66.5**	**E** **E**	**0.000** **0.007**	**0.0** **1.0**
78	US 101 SB Ramps / University Ave	East Palo Alto	LOS D	AM PM	27.9 25.8	C C	28.0 25.8	C C	0.004 0.006	0.2 0.1	28.0 25.8	C C	0.006 0.007	0.2 0.1
79	Donohoe St / University Ave	East Palo Alto	LOS D	AM PM	**76.3** 43.4	**E-** D	**77.1** 43.5	**E-** D	**0.005** 0.004	**1.3** 0.1	**77.0** 43.5	**E-** D	**0.005** 0.005	**1.2** 0.2
80	University Ave / Bay Rd	East Palo Alto	LOS D	AM PM	54.1 51.8	D- D-	54.4 52.4	D- D-	0.005 0.009	0.5 1.1	54.4 52.8	D- D-	0.005 0.013	0.4 1.7
81	University Ave / Bayfront Expy	Menlo Park (SM CMP)	LOS F	AM PM	26.4 137.3	C F	26.6 140.0	C F	0.008 0.007	0.5 3.3	26.7 140.7	C F	0.010 0.009	0.6 4.3
82	Town & Country Driveway / Embarcadero Rd	Palo Alto	LOS D	AM PM	27.8 28.3	C C	27.2 27.9	C C	0.031 0.021	-0.4 -0.3	27.2 27.8	C C	0.028 0.030	-0.3 -0.4
83	Charleston Rd / San Antonio Rd	Palo Alto (SC CMP)	LOS E	AM PM	79.2 68.3	E- E	79.4 68.6	E- E	0.001 0.002	0.4 0.5	79.6 68.6	E- E	0.002 0.002	0.8 0.6
84	US 101 SB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	11.1 12.8	B+ B	11.2 12.8	B+ B	0.003 0.000	0.2 0.0	11.1 12.8	B+ B	0.002 0.000	0.2 0.0
85	US 101 NB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	25 24.2	C C	25.1 24.2	C C	0.000 0.003	0.0 0.1	42.2 33.2	D C-	0.245 0.160	41.9 19.9

TABLE 7A.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative A			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
86	Central Expy / Rengstorff Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**447.1** **248.1**	**F** **F**	**449.7** **250.5**	**F** **F**	**0.010** **0.008**	**2.2** **2.6**	**449.8** **251.0**	**F** **F**	**0.009** **0.010**	**2.0** **3.0**
87	Central Expy / Shoreline Blvd (N)	Santa Clara County (SC CMP)	LOS E	AM PM	**224.5** **97.4**	**F** **F**	**223.6** **97.1**	**F** **F**	**0.004** **0.006**	**0.2** **-0.1**	**222.8** **96.6**	**F** **F**	**0.007** **0.007**	**-2.1** **-1.3**
88	Central Expy / Shoreline Blvd (S)	Santa Clara County (SC CMP)	LOS E	AM PM	11.2 7.5	B+ A	11.2 7.5	B+ A	0.003 0.005	-0.1 0.0	11.2 7.5	B+ A	0.006 0.007	-0.2 0.0
89	Central Expy / Castro St-Moffett Blvd	Santa Clara County (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**243.7** **225.7**	**F** **F**	**0.010** **0.009**	**5.2** **4.5**	**244.2** **226.1**	**F** **F**	**0.009** **0.011**	**4.7** **4.5**
90	Foothill Expy / Edith Ave	Santa Clara County	LOS E	AM PM	55.9 **105.5**	E+ **F**	61.5 **112.6**	E **F**	0.016 **0.015**	10.2 **11.8**	60.0 **111.1**	E+ **F**	0.012 **0.012**	7.4 **9.5**
91	Foothill Expy / Main St	Santa Clara County (SC CMP)	LOS E	AM PM	44.6 54.8	D D-	49.9 55.8	D E+	0.016 0.009	8.5 -1.3	48.4 55.5	D E+	0.012 0.009	6.1 -1.3
92	University Ave / O'Brien Dr	Menlo Park	LOS D	AM PM	9.1 13.4	A B	9.1 13.3	A B	0.005 0.006	0.0 0.0	9.1 13.3	A B	0.006 0.008	0.0 0.0
93	University Ave / Adams Dr*	Menlo Park	LOS E (warrant)	AM PM	425.5 39.6	F[10] E	456.2 41.4	F[8] E	N/A	N/A	465.4 42.4	F[10] E	N/A	N/A
94	University Ave / Runnymede St	East Palo Alto	LOS D	AM PM	15.3 19.1	B B-	15.3 19.1	B B-	0.005 0.005	0.0 0.0	15.3 19.0	B B-	0.005 0.006	0.0 0.0
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 17.3	B B	14.7 17.2	B B	0.005 0.005	0.0 0.0	14.7 17.2	B B	0.005 0.006	0.0 0.0

NOTES: **Bold text** indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

In some cases, intersections may show a reduction in average delay with the addition of Project traffic, or Additional Housing Alternative A traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County, "(SM CMP)" indicates CMP intersection in San Mateo County.

[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(Warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.

[c] AM = morning peak hour, PM = evening peak hour.

[d] Cumulative (2035) No Project and Cumulative (2035) With Proposed 2018 General Use Permit presents the results from the Cumulative (2035) Conditions with Four-Lane Page Mill Road from I-280 to Junipero Serra Boulevard Memorandum (see Appendix PMR), which evaluated the effects of the proposed Project on the surrounding transportation network assuming that Page Mill Road remained two lanes in each direction. These results are provided for comparison purposes only.

[e] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.

[f] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software packages, which applies the methods described in the 2000 *Highway Capacity Manual*.

[g] Change ("Δ") in critical volume-to-capacity ratio (V/C) between Cumulative (2035) and Cumulative (2035) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[h] Change ("Δ") in average critical movement delay between Cumulative (2035) and Cumulative (2035) With Project Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[i] A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

The intersections where there would be a significant impact under 2035 Cumulative with Additional Housing Alternative A conditions, and the reason that the impact is considered significant, are documented in **Table 7A.15-12**. Additional Housing Alternative A would make a cumulatively considerable contribution to significant impacts at two more intersections than would the proposed Project: Intersections #34 (Bowdoin Street/Stanford Avenue) and #69 (Middlefield Road/Charleston Road). In addition, this alternative would make a cumulatively considerable contribution that differs from that for the proposed Project in terms of the time period(s) when the impact would occur, as follows:

- At Intersection #33 (Foothill Expressway/Springer Road- Magdalena Avenue) – Additional Housing Alternative A (AM peak hour) versus Proposed Project (AM and PM peak hours)
- Intersection #58 (Alma Street/Charleston Road) – Additional Housing Alternative A (AM and PM peak hours) versus Proposed Project (PM peak hour)
- Intersection #89 (Central Expressway/Castro Street-Moffett Boulevard) – Additional Housing Alternative A (PM peak hour) versus Proposed Project (AM peak hour)

Measures/strategies to mitigate the contribution of Additional Housing Alternative A to significant cumulative impacts are described below.

Mitigation Measure: Implement Mitigation Measure 7A.15-2(a)-(b).

As detailed in Mitigation Measure 7A.15-2(a), Stanford shall mitigate the peak hour, peak direction transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts. Further, Mitigation Measure 7A.15-2(b) requires that Stanford mitigate the peak-hour, off-peak direction (reverse commute) transportation impacts of its additional development and population growth through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts.

Significance after Mitigation: Significant and Unavoidable.

This mitigation would substantially reduce Additional Housing Alternative A's contribution to cumulative traffic congestion impacts to intersections; however, the contribution of Additional Housing Alternative A to the cumulative impact would be a significant and unavoidable impact because there is no feasible mitigation to improve some of the affected intersections, and for others it is uncertain whether it would be feasible to improve the intersections if the No Net New Commute Trips standard is not achieved or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2035 Cumulative with Additional Housing Alternative A conditions identified in Table 1A in Mitigation Measure 7A.15-2(a) are located in other jurisdictions, and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. At one intersection, the

TABLE 7A.15-12
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#17 Junipero Serra Blvd – Foothill Expressway / Page Mill Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#19 Hanover Street / Page Mill Road (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#20 El Camino Real / Page Mill Road – Oregon Expressway (AM and PM Peak Hours)	**VTA:** During the AM peak hour, project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F. During the PM peak hour, under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#21 Middlefield Road / Oregon Expressway (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#29 Foothill Expressway / Hillview Avenue (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#31 Foothill Expressway / San Antonio Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#32 Foothill Expressway / El Monte Avenue (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#33 Foothill Expressway / Springer Road – Magdalena Avenue (AM and PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#34 Bowdoin Street / Stanford Avenue (PM Peak Hour)	**Palo Alto:** Project-generated traffic would cause a degradation from an acceptable LOS D to an unacceptable LOS F.
#37 El Camino Real / Encinal Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#38 El Camino Real / Valparaiso Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.

TABLE 7A.15-12 (CONTINUED)
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#41 El Camino Real / Ravenswood Road (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#48 El Camino Real / Embarcadero Road (PM Peak Hour)	**VTA:** Project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F.
#56 Alma Street / Hamilton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#59 Middlefield Road / Marsh Road (AM Peak Hour)	**Atherton:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#63 Middlefield Road / Lytton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#66 Middlefield Road / Embarcadero Road (AM and PM Peak Hours)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#69 Middlefield Road / Charleston Road (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#89 Central Expwy / Castro St. – Moffett Blvd. (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#90 Foothill Expressway / Edith Avenue (PM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.

mitigation measure would improve LOS and delay, but would not mitigate impacts to a less-than-significant level. At other intersections, there are no feasible improvements to reduce the impact to a less-than-significant level. For these reasons, the impact would remain significant and unavoidable.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by a project (in this case, Additional Housing Alternative A), the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are discussed below. In all cases, these effects are determined to be less than significant.

- **Intersection #2: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative A conditions, which stipulates contribution of fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report.***

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the Additional Housing Alternative A to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #17: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative A conditions, which stipulates contribution of fair-share funding to grade-separation improvement project, at the signalized intersection of Junipero Serra Boulevard – Foothill Expressway / Page Mill Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented).**

  For Additional Housing Alternative A, the impact at this intersection cannot be mitigated to a less-than-significant level with the mitigation measures identified for the proposed Project; instead, the above-described interchange is needed. Although the configuration of this proposed interchange has yet to be determined, additional right-of-way would be required to construct this improvement. Additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians. Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  This mitigation differs from the mitigation under the proposed Project. For the proposed Project, the impact at this intersection would be reduced to a less-than-significant level with the following mitigation: Contribute fair share funding toward:

  (1) addition of a third through lane on Page Mill Road in the westbound direction (for a total of two left-turn lanes, three through lanes, and a right turn lane plus a bike lane);

(2) addition of a receiving lane to westbound Page Mill Road (resulting in three lanes from Junipero Serra Boulevard approximately to Old Page Mill Road); and

(3) installation of an overlap phase for northbound and southbound right-turning vehicles and widening of the southbound approach to two lanes between Page Mill Road and Stanford Avenue to align with the existing designated right-turn lane.[43]

It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* to widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. The Tier 1 improvement is fully funded through Measure B, but conservatively is not anticipated to be in place by 2035. This was evaluated as a potential mitigation measure and was determined not to bring the impact to a less-than-significant level under 2035 Conditions.

***Impacts of Mitigation*:** With the exception of construction-related impacts, the mitigation would not have a substantial adverse effect on bicycle QOS, which would remain at QOS 3.5. Pedestrian QOS would improve from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 2 to 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #19: Contribute fair-share funding to installation of a second westbound left-turn lane, at the signalized intersection of Hanover Street / Page Mill Road, identified as an option in the *Page Mill Expressway Corridor Study Report*.**

  To accommodate the construction of a second westbound left-turn lane, the westbound approach would need to be widened from three to four lanes and may require the removal of the center median, reduction in lane width, and/or reduction in bicycle lane width at the intersection. There is adequate right-of-way to accommodate the dual westbound left-turn lanes and associated receiving lanes on Hanover Street.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4 and QOS 3, respectively. With the proposed mitigation, limited bicycle facilities on Hanover Street would remain, as well as the intersection crossing distance, maintaining but not exacerbating the current uncomfortable conditions for bicyclists at the intersection. Pedestrian crossing distances would be unchanged on all approaches. The proposed mitigation measure would not create additional conflicts for the City of Palo Alto's proposed Class I facility on the south side of Page Mill Road as identified in their *Bicycle and Pedestrian Transportation Plan*.

[43] The third improvement was identified as a mitigation measure in the Draft EIR. Two additional improvements have been added to ensure the impact is mitigated to a less-than-significant level under the assumption that Page Mill Road is four lanes, rather than six lanes as previously assumed.

It is noted that there is another Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*. The improvement would convert the signal phasing to an eight-phase signal. That improvement would not reduce the contribution of Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. Therefore, it was not identified as a mitigation measure. The proposed mitigation measure for Intersection 19 would not conflict with the County's Tier 1 intersection improvement.

- **Intersection #20: Contribute fair-share funding to the reconfiguration of the north leg of the intersection to include a designated right-turn lane with an overlap signal phase; the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, at the signalized intersection of El Camino Real / Page Mill Road – Oregon Expressway, as identified in the *Page Mill Expressway Corridor Study Report*. In addition, a designated southbound right-turn lane with an overlap signal phase would be installed.**

  This is the same mitigation measure identified for the proposed Project, except that the addition of a designated southbound right-turn lane with an overlap signal phase would be required under Additional Housing Alternative A to mitigate the significant impact to a less-than-significant level.

  To accommodate the reconfiguration of the east leg of the intersection, parking would need to be removed along the south side of Page Mill Road, and the median island would need to be shifted to the south to accommodate the additional westbound lane. Little to no right-of-way would be needed to accommodate this improvement; however, an easement would be needed on the north side of the roadway to preserve the sidewalk width, and the bus stop on the southeast corner of the intersection on Oregon Expressway may need to be relocated or further addressed during design. These improvements are identified in Santa Clara County's *Page Mill Corridor Expressway Plan*, and the extension of the double westbound left-turn lanes is identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040* along with enhanced pedestrian facilities on the southwest and southeast corners of the intersection.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. However, because this improvement depends on the actions of Caltrans, and the provision of the remaining improvements may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions assuming the parking is removed next to the eastbound receiving lanes, and right-turn slip lanes and/or high vehicle turning speeds would remain, maintaining the current uncomfortable conditions for bicyclists and pedestrians at the intersection. The proposed mitigation measure would not conflict with the City of Palo Alto's *Bicycle and Pedestrian Transportation Plan* to implement a Class III facility on Oregon Expressway east of the intersection.

- **Intersection #30: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative A conditions, which stipulates contribution of fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of- way would be required to construction this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the Additional Housing Alternative A's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #31: Contribute fair-share funding to the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue.**

  A third receiving lane would be added on the south leg of Foothill Expressway, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040*, to extend the southbound right-turn lane from El Monte Avenue to San Antonio Road, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, as it would remain unchanged at QOS 4. With the proposed mitigation, right-turn slip lanes and high vehicle turning speeds would remain, maintaining the current uncomfortable environments for bicyclists at the intersection. The proposed mitigation measure would have no effect on pedestrian quality of service as there is no pedestrian access at this intersection.

It is noted that the full Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #31 would implement the southbound widening.

- **Intersection #32: Contribute to fair-share funding to the addition of a third northbound through lane, and an associated receiving lane at the signalized intersection of Foothill Expressway / El Monte Avenue, as identified in the draft *Santa Clara County Expressway Plan 2040.***

  To accommodate the construction of a third northbound through lane, the northbound approach would be widened from two to three lanes and may require the acquisition of additional right-of-way. The receiving lanes on the north side of the intersection would also need to be widened, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040,* to extend the northbound right-turn lane from San Antonio Road to El Monte Avenue, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of the Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. Because the remainder of these improvements would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged, at QOS 4 (for both). The east-west bicycle and pedestrian crossing distances would increase slightly due to the additional through lane and continue to have right-turn slip lanes and high vehicle turning speeds, while maintaining the current QOS score.

  It is noted that the full Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #32 would implement the northbound widening, but while southbound widening would increase the available storage capacity, it would not be enough to reduce the Additional Housing Alternative A AM peak-hour impact to a less-than-significant level. Therefore, the southbound widening was not identified as a potential mitigation measure at this intersection.

- **Intersection #33: Contribute fair-share funding to the following improvements, at the signalized intersection of Foothill Expressway / Springer Road – Magdalena Avenue, as identified as a Tier 2 improvement in the draft Santa Clara County *Expressway Plan 2040*:**

  – Convert the signal to provide 8-phase phasing;

  – Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and

– Change the lane configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.

To accommodate an eight-phase signal, the eastbound and westbound left-turn movements would require designated left-turn lanes, and may require the acquisition of additional right-of-way. To accommodate the change to eastbound and westbound lane configurations, the center median on the west leg of the intersection would need to be shifted to incorporate a designated left-turn lane and remove one receiving lane from the west leg. The eastbound approach would require restriping to change the shared left-turn/through lane to a designated left-turn lane.

Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. To construct the designated eastbound left-turn lane, the eastbound lanes will be narrowed and the center median may be reduced, resulting in the same curb-to-curb width, but increasing the number of travel lanes. The proposed mitigation would not adversely affect the City of Los Alto's existing Class II bicycle facilities at the intersection.

It is noted that the full Tier 2 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes converting to an eight-phase signal, operational/safety improvements at the County Club Drive intersection, and potentially adding a signal at the adjacent Berry Avenue intersection. The mitigation measure identified above for Intersection #33 would implement the eight-phase signal and associated lane configuration changes at the intersection.

- **Intersection #34: Contribute fair-share funding to the installation of a traffic signal at the unsignalized intersection of Bowdoin Street / Stanford Avenue.**

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Palo Alto, and requires additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the bicycle StreetScore+ QOS, as it would remain unchanged at QOS 2.0. Pedestrian crossing distances would remain unchanged (one lane in each direction) in all directions, but a traffic signal would provide protected crossing times for pedestrians, which increases their quality of service compared to an uncontrolled pedestrian crossing from QOS 1.5 to 1.0.

- **Intersection #37: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Encinal Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to the significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.8 and QOS 2.7, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances on all approaches. While the bicycle StreetScore+ QOS on the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a dedicated right-turn lane. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) proposes Class II bike lanes on El Camino Real between Valparaiso Avenue and Alejandra Avenue, and the City of Menlo Park El Camino Corridor Study (approved May 2016) proposes buffered Class II facilities (bicycle lanes) on El Camino Real between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At Encinal Avenue, the northbound right-turn lane would allow for the conversion of a through / right-turn lane while maintaining the City's goal to provide bicycle lanes up to the Encinal Avenue intersection. The proposed mitigation measure could conflict with a Class II bicycle lane if only on-street parking is removed in order to add a third through lane. However, if the center median were narrowed, space for a bicycle lane could be provided. The existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers if the proposed mitigation measure is constructed. However, this is typical for bus stops on El Camino Real and other major arterials.

- **Intersection #38: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Valparaiso Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 4, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. While the bicycle StreetScore+ QOS on the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a dedicated right-turn lane. The San Mateo County Comprehensive Bicycle and Pedestrian Plan (2011) proposes Class II facilities on El Camino Real between Valparaiso Avenue and Alejandra Avenue and the City of Menlo Park's El Camino Real Corridor Study (approved May 2016) proposes buffered Class II facilities (bicycle lanes) between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At Encinal Avenue, the northbound right-turn lane remains in place under the preferred alternative, which would allow for the conversion to a through/right-turn lane while maintaining the City's goal to provide bicycle lanes up to the Encinal Avenue intersection. The proposed mitigation measure could conflict with a Class II facility if only on-street parking is removed in order to add a third through lane. However, if the center median were narrowed, space for a bicycle lane could be provided. The existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers if the proposed mitigation measure is constructed. However, this is typical for bus stops on El Camino Real and other major.

- **Intersection #41: Contribute fair-share funding reconfiguration of the eastbound approach on Menlo Avenue to include an exclusive left-turn lane, and to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Ravenswood Road.**

  This is the same mitigation measure identified for the proposed Project, except that the addition of an exclusive eastbound left-turn lane would be required under Additional Housing Alternative A to mitigate the significant impact to a less-than-significant level.

  To accommodate the northbound lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real; the widening of Menlo Avenue would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 (for both). The proposed mitigation would not alter the existing pedestrian crossing distances, except on the west leg of the intersection, across which pedestrians would experience an additional 10-12 feet of exposure while in the intersection. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) and the City of Menlo Park *Comprehensive Bicycle Development Plan* (2005) propose Class III bike routes on El Camino Real at Valparaiso Avenue. The proposed mitigation measure would not conflict with a Class III bikeway.

- **Intersection #48: Contribute fair-share funding to the addition of a second northbound left-turn lane, at the signalized intersection of El Camino Real / Embarcadero Road.**

  To accommodate the construction of a second northbound left-turn lane, the northbound approach would be widened from four to five lanes by potentially reducing the lane widths, reducing the width of the center median, and/or removing on-street parking for the length of the additional left-turn pocket and taper. Addition right-of-way may be required to accommodate the second northbound left-turn lane.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.8 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, but would add an additional travel lane on the south leg of the intersection, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*. It should be noted that the City of Palo Alto is currently designing bicycle improvements at this intersection.

  The VTA El Camino Real Bus Rapid Transit (BRT) Project would upgrade Rapid Bus Route 522 to have BRT status. The geometric alternatives included in the draft Environmental Impact Report for the BRT Project do not include a separate bus lane through this intersection. Some alternatives studied include the creation of outboard bus lanes through the removal of parking on the south side of El Camino Real. Because there is no final design for this intersection, and the BRT project completion date is uncertain, it is not possible to determine what, if any, effect this mitigation measure would have on the BRT Project. However, the existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers; this typical for bus stops on El Camino Real and other major arterials.

- **Intersection #56: Contribute fair-share funding to the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, at the signalized intersection of Alma Street / Hamilton Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the north side of Hamilton Avenue.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the

contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.5 and QOS 2, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*.

- **Intersection #58: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative A conditions, which stipulates contribution of fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would improve the level of service, and the impact would be reduced, but not to a less-than-significant level. Therefore, the contribution of Additional Housing Alternative A to this impact would remain considerable, and the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection, and remain unchanged on all other approaches, while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on the northbound and southbound approaches. The proposed mitigation measure for Intersection #58 would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

- **Intersection #59: Contribute fair-share funding to the addition of a second westbound left-turn lane and a second receiving lane on the south leg, at the signalized intersection of Middlefield Road / Marsh Road.**

  The construction of a second westbound left-turn lane and a second receiving lane would require the acquisition of additional right-of-way. This mitigation measure is consistent with recommendations in the *ConnectMenlo Final EIR,* the *Middle Plaza at 500 El Camino Real Draft EIR*, the *Menlo Park Facebook Campus Expansion Project FEIR* and the *Menlo Gateway Final EIR*. The Town of Atherton has preliminary plans to redesign the intersection.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo

Park and Town of Atherton, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The proposed mitigation would cause the bicycle StreetScore+ QOS to worsen from QOS 2.7 to QOS 3; the pedestrian StreetScore+ QOS would remain unchanged at QOS 3. With the proposed mitigation, a second receiving lane would be added on the southbound approach, causing an uncomfortable situation where bicyclists travel along a four-lane roadway compared to a three-lane roadway existing today. Missing sidewalks and curb ramps cause uncomfortable situations for pedestrians at all intersection crossings.

- **Intersection #69: Contribute fair-share funding to the addition of a designated eastbound right-turn lane with an overlap signal phase, at the signalized intersection of Middlefield Road / Charleston Road.**

  The construction of an eastbound right-turn lane would require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle, as the bicycle StreetScore+ QOS would remain at QOS 3; the pedestrian StreetScore+ QOS would decrease from QOS 2 to 2.5. With the proposed mitigation, bicycle and pedestrian southbound crossing distances would increase by approximately 10-12 feet with the addition of a right-turn lane resulting in a slightly less comfortable walking environment when crossing this leg of the intersection. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class II (Enhanced Bikeway) facilities as identified in their *Bicycle and Pedestrian Transportation Plan*.

- **Intersection #89: Close Castro Street at the train tracks to form a T-intersection of Central Expressway / Moffett Boulevard, consistent with recommendations in the May 2017 *Mountain View Transit Center Master Plan*.**

  The City of Mountain View has approved plans to close Castro Street (the west leg) at the train tracks, which would change the current four-leg intersection to a T-intersection of Central Expressway and Moffett Boulevard. This improvement would not require any additional right-of-way if implemented by the City of Mountain View. Given that this is the City's preferred improvement and would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less-than-considerable level, the closure of Castro Street is the identified mitigation measure at this intersection; if Castro Street is independently closed by the City of Mountain View, Stanford would not need to contribute funding to any improvements at this intersection.

It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*, which would grade-separate the train tracks from the intersection, increasing the available capacity at the intersection and reducing Additional Housing Alternative A's impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative A's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The proposed mitigation is anticipated to improve bicycle and pedestrian QOS; the bicycle QOS would shift from 3.3 to 1.7, and the pedestrian QOS would shift from 4 to 2. With the closure of Castro Street, pedestrian and bicycle crossings will be moved to a separated underground facility to cross Central Expressway and the Caltrain tracks with the exception of the east leg of the intersection where pedestrian crossings would still occur at-grade. Northbound and southbound bicyclists would continue to travel on Central Expressway, but bicyclists traveling from Moffett Boulevard to Castro Street would use the underground crossing.

***Intersection #89 Alternative Mitigation*:** If the closure of Castro Street is not implemented in a timely manner and/or the City of Mountain View does not pursue the improvement, the following alternative (back-up) mitigation measure is proposed, which would reduce the contribution of Additional Housing Alternative A to this significant cumulative impact to a less than considerable level:

> *Intersection #89 Alternative Mitigation Measure*: Contribute fair-share funding to the construction of a second southbound left-turn lane from Central Expressway to Moffett Boulevard.

To accommodate the construction of a second southbound left-turn lane, the Central Expressway center median would need to be reduced and/or removed; the improvement would not require any additional right-of-way. Given the existing and proposed geometry, signal timings may also need to be modified to provide lead-lag left turns (to account for potential truck turn conflicts). With this mitigation, the contribution of Additional Housing Alternative A to the significant cumulative impact would be reduced to a less-than-considerable level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative A to the significant cumulative impact is mitigated. In that case, the impact would remain significant and unavoidable.

Remaining Intersections: Due to physical constraints, no feasible mitigation measures have been identified at the following intersections, and the contribution of Additional Housing Alternative A to significant cumulative impacts would remain considerable, and the cumulative impacts would remain significant and unavoidable:

21. Middlefield Road / Oregon Expressway – the constraint is the proximity of the Oregon Avenue frontage road and the County's desire to preserve the shoulder striping along Oregon Expressway for use by bicyclists.

29. Foothill Expressway / Hillview Avenue – the constraint is the proximity of the Miranda Avenue / Hillview Avenue intersection and lack of improvement identified in the draft Santa Clara County Expressway Plan 2040.

63. Middlefield Road / Lytton Avenue – the constraint is the proximity of the residential units near the intersection.

66. Middlefield Road / Embarcadero Road – the constraint is the proximity of the residential units near the intersection.

90. Foothill Expressway / Edith Avenue – the constraint is the proximity of the residential units and retail space near the intersection.

See **Table 7A.15-13** for mitigated LOS conditions.

Impact 7A.15-10: Implementation of Additional Housing Alternative A, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Additional Housing Alternative A conditions. (*Significant)*

Please note that only the freeway mainline segment impact analysis is provided for the Additional Housing Alternative A analysis. As described on Draft EIR page 5.15-58, freeway ramp queueing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions.

As described above, the results for the Cumulative (2035) No Project and 2035 Cumulative With Proposed Project conditions have been updated since publication of the Draft EIR to correct the assumed lane configuration on Page Mill Road under cumulative conditions. Modeling conducted for the Draft EIR assumed Page Mill Road would have six travel lanes based on VTA's 2040 traffic model. Subsequently, VTA staff indicated that inclusion of the 6-lane configuration had been an error on the part of VTA. The updated results are based on modeling that assumes no change to the existing 4-lane configuration for Page Mill Road.

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Under Cumulative (2035) With Additional Housing Alternative A Conditions, the following 16 freeway segments would meet the significance criteria, which is three more than under Cumulative (2035) with Project Conditions (four new segments meet the criteria, and one segment that meets the criteria under the Project would not meet the criteria under the alternative):

- Northbound SR 85
  - Saratoga Avenue to De Anza Boulevard (PM peak hour);
  - South De Anza Boulevard to Stevens Creek Boulevard (AM and PM peak hours);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (AM and PM peak hours);
  - South De Anza Boulevard to Saratoga Avenue (PM peak hour);

TABLE 7A.15-13
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Additional Housing Alt. A		Mitigation Measure	2035 Cumulative With Additional Housing Alt. A (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**154.7** 19.4	**F** B-	See MM 7A.15-2(a) (Table 1A)	**66.4** 16.3	**E** B	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**196.8** **178.3**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	**116.8** **89.3**	**F** **F**	LTS/SU
19	Hanover Street / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**96.0** 62.4	**F** E	See MM 7A.15-2(a) (Table 1A)	75.0 59.7	E- E+	LTS/SU
20	El Camino Real / Page Mill Road – Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**91.6** **98.5**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	68.6 **83.0**	E **F**	LTS/SU
21	Middlefield Road / Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.5** **103.2**	**F** **F**	*N/A (no feasible improvements)*			SU
29	Foothill Expressway / Hillview Avenue	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**132.1** 63.3	**F** E	*N/A (no feasible improvements)*			SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**200.5** **207.9**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	41.9 70.7	D E	LTS/SU
31	Foothill Expressway / San Antonio Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	42.0 **169.7**	D **F**	See MM 7A.15-2(a) (Table 1A)	42.0 46.3	D D	LTS/SU
32	Foothill Expressway / El Monte Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**147.6** **136.9**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	74.2 **113.0**	E **F**	LTS/SU
33	Foothill Expressway / Springer Road – Magdalena Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.6** **154.7**	**F** **F**	See MM 7A.15-2(a) (Table 1A)	**122.4** **147.9**	**F** **F**	LTS/SU
34	Bowdoin Street / Stanford Avenue	Palo Alto	LOS D	AM PM	16.7 25.8	C D	25.7 **55.4**	D **F**	See MM 7A.15-2(a) (Table 1A)	9.5 17.7	A B	LTS/SU
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.8 **92.5**	D **F**	See MM 7A.15-2(a) (Table 1A)	35.6 **67.0**	D+ **E**	LTS/SU
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 **57.2**	D- **E+**	See MM 7A.15-2(a) (Table 1A)	52.4 52.3	D- D-	LTS/SU

TABLE 7A.15-13 (CONTINUED)
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE A INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Additional Housing Alt. A		Mitigation Measure	2035 Cumulative With Additional Housing Alt. A (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
41	El Camino Real / Ravenswood Road	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.9 **66.3**	D **E**	See MM 7A.15-2(a) (Table 1A)	46.7 **59.7**	D **E+**	LTS/SU
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	63.0 **90.1**	E **F**	See MM 7A.15-2(a) (Table 1A)	54.1 78.3	D- E-	LTS/SU
56	Alma Street / Hamilton Avenue	Palo Alto	LOS D	AM PM	10.2 **57.7**	B+ **E+**	10.6 **63.6**	B+ **E**	See MM 7A.15-2(a) (Table 1A)	10.2 41.2	B+ D	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	123.4 121.5	**F** **F**	130.0 **129.4**	F **F**	See MM 7A.15-2(a) (Table 1A)	123.3 **125.7**	F **F**	SU
59	Middlefield Road / Marsh Road	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.7** **77.5**	**E-** E	See MM 7A.15-2(a) (Table 1A)	41.8 **68.5**	D **E**	LTS/SU
63	Middlefield Road / Lytton Avenue	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.0 **70.1**	D **E**	N/A (no feasible improvements)			SU
66	Middlefield Road / Embarcadero Road	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**58.8** **72.8**	**E+** **F**	N/A (no feasible improvements)			SU
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	**58.0** **67.7**	**E+** **E**	**58.5** **69.8**	**E+** **E**	See MM 7A.15-2(a) (Table 1A)	**56.6** **62.5**	**E+** **E**	LTS/SU
89	Central Expwy / Castro St-Moffett Blvd	Santa Clara Co. (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**244.2** **226.1**	**F** F	See MM 7A.15-2(a) (Table 1A)	**91.9** **129.3**	**F** **F**	LTS/SU
90	Foothill Expressway / Edith Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	55.9 **105.5**	E+ **F**	60.0 **111.1**	E+ **F**	N/A (no feasible improvements)			SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection; SU = significant and unavoidable.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

- Northbound I- 280
  - Lawrence Expressway to Wolfe Road (PM peak hour);
  - Wolfe Road to De Anza Boulevard (AM peak hour);
  - SR 85 to Foothill Expressway (AM and PM peak hours);
  - Foothill Expressway to Magdalena Avenue (AM peak hour);
  - Sand Hill Road to Woodside Road (PM peak hour);

- Southbound I-280
  - Woodside Road to Sand Hill Road (AM peak hour);
  - Magdalena Avenue to Foothill Expressway (PM peak hour);
  - Foothill Expressway to SR 85 (AM and PM peak hour);
  - SR 85 to De Anza Boulevard (PM peak hour);
  - De Anza Boulevard to Wolfe Road (PM peak hour)
  - Wolfe Road to Lawrence Expressway (PM peak hour).

In addition, Additional Housing Alternative A would extend significant impacts on three freeway segments to both the AM and PM peak hours, whereas the proposed 2018 General Use Permit would result in a significant impact to those three freeway segments during only one of the two peak hours. One freeway segment with a significant impact under the proposed Project (Southbound I-280 from Sheep Camp Trail to Edgewood Road) would not have a significant impact under Additional Housing Alternative A due to the reduction in commuter trips traveling toward campus in the morning. Overall, Additional Housing Alternative A would not reduce the significant impacts of the proposed 2018 General Use Permit.

The revised assumption that Page Mill Road remains four lanes between I-280 and Junipero Serra Boulevard – Foothill Road in 2035 results in two additional freeway segments meeting the impact criteria under the proposed Project (the 2018 General Use Permit) compared to the number of freeway segments identified as meeting the criteria in the Draft EIR. The two additional freeway segments would be on I-280 southbound (Woodside Road to Sand Hill Road [AM Peak Hour], and SR 85 to De Anza Boulevard [PM Peak Hour]). The Draft EIR concludes that impacts to freeway segments would be significant and unavoidable under Cumulative (2035) with Project conditions. The addition of two more freeway segments to the list presented in the Draft EIR does not change the Draft EIR's conclusion.

There are limited options to widen freeway segments that meet the significance criteria due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 7A.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fees from exceeding the No Net New Commute Trips standard to alternative programs that reduce trips. Nevertheless, because it is uncertain whether the No Net New Commute Trips standard would be achieved, the freeway impacts under Additional Housing Alternative A would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable.

Impact 7A.15-11: Implementation of Additional Housing Alternative A, in combination with other past, present, and reasonably foreseeable future, projects, would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. Similar to the proposed 2018 General Use Permit, Additional Housing Alternative A does not propose infrastructure changes outside the Project site and, thus, would not interfere with the ability of transit agencies to modify or expand service. Therefore, Additional Housing Alternative A's impact on transit services would be less than significant. Additional Housing Alternative A would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 7A.15-14**, Additional Housing Alternative A would not add substantial delays relative to the total route travel time to any of the transit routes assessed, although certain delays are higher under this alternative than under the proposed Project. The additional delay would be fewer than 30 seconds on all but seven of the routes and increase travel times by less than 60 seconds on all but four routes. Dumbarton Express 1 would experience a longer delay change, at 108.3 seconds in the westbound direction during the AM peak hour only and 86.6 seconds in the eastbound direction during the PM peak hour only, with Additional Housing Alternative A. For both peak hours, this delay constitutes less than three percent of the total travel time on that route.

Next to the Dumbarton Expressway 1 route, VTA Routes 104, 22, and 522 would experience delays greater than 60 seconds during the PM peak hour for this Alternative. VTA is studying the implementation of a Bus Rapid Transit (BRT) system on El Camino Real that would extend into the study area with a terminus at the Palo Alto Downtown Transit Center. The BRT system would be an update of the existing 522 service. Therefore, delays for the future BRT service would be similar to the delay for the existing 522 service. Of the seven alternatives presented in the El Camino Real BRT Draft EIR/EA (October 2014), only one would provide a dedicated BRT lane in Palo Alto extending from City of Mountain View city limits to Embarcadero Road. All other alternatives would require buses to operate within mixed-flow lanes or HOV lanes without signal modifications. Therefore, under the majority of the alternatives being considered, the delays to the future BRT service would be similar to the delays experienced by the existing 522 service.

Mitigation: None required.

TABLE 7A.15-14
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE A TRANSIT ROUTE DELAYS[a]

Route		Direction	Peak Hour	Additional Route Average Delay (seconds)[b]	
				Proposed Project[c]	Additional Housing Alternative A
22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM	12.2	23.6
			PM	35.8	72.4
		Westbound	AM	20.9	14.6
			PM	17.4	33.6
35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM	11.8	14.3
			PM	22.0	27.0
		Southbound	AM	16.7	12.5
			PM	13.2	18.6
89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM	< 5.0	< 5.0
			PM	< 5.0	14.3
		Southbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
102	South San Jose to Palo Alto	Northbound	AM	< 5.0	< 5.0
		Southbound	PM	16.7	60.4
104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0	64.3
		Westbound	AM	26.3	82.3
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM	9.1	17.7
			PM	34.1	68.0
		Westbound	AM	20.9	14.6
			PM	17.4	33.6
281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM	6.5	11.8
			PM	9.6	15.5
		Westbound	AM	< 5.0	< 5.0
			PM	< 5.0	< 5.0
ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM	< 5.0	< 5.0
			PM	10.0	10.3
		Southbound	AM	< 5.0	5.5
			PM	< 5.0	9.3
DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM	< 5.0	< 5.0
			PM	7.4	< 5.0
		Westbound	AM	22.6	48.6
			PM	9.2	26.3
DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM	< 5.0	44.4
			PM	8.6	86.6
		Westbound	AM	31.1	108.3
			PM	26.2	79.3
U	Fremont BART to Stanford Oval	Eastbound	PM	29.4	49.4
		Westbound	AM	17.0	51.4
E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM	5.9	12.2
			PM	14.2	19.3
		Westbound	AM	11.8	< 5.0
			PM	< 5.0	< 5.0
C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM	< 5.0	< 5.0
			PM	8.9	9.8
		Westbound	AM	29.1	29.7
			PM	6.3	10.0

[a] Transit route delay is calculated by summing each transit route movements through the study intersections. Some movements may experience large increases or decreases in delay as a result of the analysis software (Traffix 8.0) redistributing green time for each phase.
[b] Additional Housing Alternative A was not considered to have a measurable change in overall transit route delay if the increase in travel time was less than five seconds or the travel time improved slightly (due to changes in signal timing, critical movement changes, etc.).
[c] Cumulative (2035) With Proposed 2018 General Use Permit presents the results from the Cumulative (2035) Conditions with Four-Lane Page Mill Road from I-280 to Junipero Serra Boulevard Memorandum (see Appendix PMR), which evaluated the effects of the proposed Project on the surrounding transportation network assuming that Page Mill Road remained two lanes in each direction. These results are provided for comparison purposes only.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Vehicle Miles Traveled Impacts

California has enacted a law (SB 743) that will phase out the traditional Transportation Impact Assessment as the approach used in documents prepared to comply with CEQA, and replace that methodology with an analysis of Vehicle Miles Traveled. A VMT Analysis evaluates vehicle trips made throughout the day, and focuses on the number and length of vehicle trips made by project employees and residents. Measures to reduce VMT include locating a project near major transit stops and high-quality transit corridors, improving bicycle and pedestrian facilities, and instituting programs to encourage travel by modes other than driving alone. Rather than increasing road capacity, a VMT analysis focuses on getting people out of their cars.

As was shown to be the case for the proposed Project (presented in the Draft EIR), the areas of the Stanford campus where development could occur under Additional Housing Alternative A are within 1/2 mile of an existing major transit stop or an existing stop along a high quality transit corridor. The revised draft CEQA Guidelines circulated by OPR in November 2017 continue to state that generally, projects located on sites within 1/2 mile of an existing major transit stop or an existing stop along a high quality transit corridor should be presumed to have a less-than-significant transportation impact. Nevertheless, a quantitative assessment of VMT generated by Additional Housing Alternative A is provided, similar to that provided for the proposed Project.

The County has not adopted a threshold or established a standard methodology for evaluating VMT. Like the proposed Project, Additional Housing Alternative A represents a unique and distinct set of circumstances compared to other development applications presented to the County and located in predominately rural unincorporated areas of the County because the proposed development that would occur on Stanford lands is predominantly in-fill in nature, inclusive of mixed uses (housing and academic space), and would be located near transit systems. Therefore, the approach used in the following impact discussion would not be applicable to a VMT evaluation of other development applications under consideration by the County.

The following discussion evaluates the VMT characteristics of Additional Housing Alternative A and is based on the information from the Vehicle Miles Traveled (VMT) Analysis. The evaluation reflects the stated intent of SB 743 and is informed by the draft proposals developed by the State Office of Planning and Research (OPR) for performing SB 743 assessments in CEQA documents.

Significance Criteria

In November 2017, OPR published proposed amendments to the CEQA Guidelines to address the analysis of impacts to transportation.[44] OPR proposes the following criteria for analyzing transportation impacts of land use projects:

Proposed New Section 15064.3. Determining the Significance of Transportation Impacts.

> *(a) Purpose.*
>
> *This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of*

[44] See http://opr.ca.gov/docs/20171127_Text_of_15064-3.pdf.

transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding highway capacity), a project's effect on automobile delay does not constitute a significant environmental impact.

(b) Criteria for Analyzing Transportation Impacts.

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.

Other than the two presumptions listed in proposed CEQA Guidelines section 15064.3(b)(1), OPR does not propose to establish numeric significance criteria through the CEQA Guidelines. OPR's Technical Advisory provides numeric thresholds that an agency could choose to use when assessing the significance of a project's additional vehicle miles traveled in the event that the presumptions in proposed CEQA Guidelines section 15064.3(b)(1) do not apply.

Based on OPR's *Proposed Updates to the CEQA Guidelines* (November 2017) and OPR's latest *Technical Advisory on Evaluating Transportation Impacts in CEQA* (April 2018), the following significance criteria were used to assess VMT for Additional Housing Alternative A:

1. Is the project within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor? If so, the project is presumed to result in a less-than-significant impact on VMT.
2. Alternatively, the proposed Project is considered to result in a significant impact to VMT if project-related VMT would exceed the following numeric thresholds:
    - Residential Per Capita Daily VMT: A project exceeding existing regional household daily VMT per capita minus 15 percent.[45]
    - Worker Per Capita Daily VMT: A project exceeding a level of 15 percent below existing regional daily VMT per worker.

Approach to Analysis

OPR's *Technical Advisory* suggests that lead agencies can evaluate each component of a mixed-use project independently, and apply the significance threshold for each project type included in the mixed-use project. The analysis of each use may reflect credit for internal capture of trips within the project. Based on this guidance, residential and worker VMT for Additional Housing

[45] The Draft EIR expressed this criterion as follows: Residential Per Capita Daily VMT: A project exceeding *both* existing household daily VMT per capita in the aggregate of all incorporated jurisdictions in the County minus 15 percent, *and* existing regional household daily VMT per capita minus 15 percent. Because regional household daily VMT per capita was higher than the aggregate of all incorporated jurisdictions in the County, the Draft EIR used 15 percent below regional household daily VMT per capita as the benchmark for analysis. Use of a standard of 15 percent below regional household daily VMT per capita is consistent with OPR's updated Technical Advisory and the simplified criterion is used in this recirculated Draft EIR.

Alternative A were assessed independently, and the project-specific data used in the evaluation account for internal capture.

Populations Included in the Analysis

Stanford anticipates that Additional Housing Alternative A will continue to cover all of its lands in unincorporated Santa Clara County. However, the General Use Permit does not apply to land uses within those areas that are permitted as of right (e.g., the single-family and two-family residences in the faculty/staff subdivision), and therefore are not included in this VMT analysis. In addition, Stanford does not propose development under Additional Housing Alternative A in two areas zoned for medium-density faculty and staff housing (the Peter Coutts housing area and the Olmsted Terrace housing area). Nor does Stanford propose development outside the Academic Growth Boundary, including on the Stanford Golf Course. Therefore, these areas are not included in the VMT analysis.

Benchmarks Included in the Analysis

Based on the OPR guidance described above, the numeric benchmarks against which Additional Housing Alternative A worker and resident VMT were compared are:

- the Bay Area regional daily average home-based-work VMT per worker; and
- the Bay Area regional daily average home-based VMT per capita.
- The VTA transportation model is a trip-based model developed and validated for the estimation of trips made for home-based work, home-based non-work and non-home based trips. OPR's *Technical Advisory* states that home-based trips can be the focus for analysis of residential projects, and home-based-work trips can be the focus of the analysis for office projects. Therefore, the VTA model is a reliable source to establish the Bay Area and Santa Clara County average daily VMT per worker and per capita at an aggregate level.

OPR's April 2018 *Technical Advisory* continues to recommend that regional, not city or county-level, VMT averages should be used for judging impacts of employment-generating projects. The April 2018 *Technical Advisory* also continues to recommend that the benchmark for residential projects should be either regional averages or a weighted average of all cities within the county. In this case, the regional average represents the benchmark for residential VMT generation.

OPR's April 2018 *Technical Advisory* recommends setting thresholds of significance at 15 percent below the regional benchmark for average daily VMT per worker[46] or per capita.

[46] OPR's Technical Advisory does not address travel by college students. The omission of VMT from students traveling to and from the campus would leave a large gap in the VMT picture for Stanford; therefore, student trips are included in the assessment of Worker VMT. While student travel behavior is similar to that of faculty and staff, a sensitivity analysis was prepared for Worker VMT that did not include the student travel. This analysis was prepared to document that inclusion of the students did not overly influence or obscure the level of VMT per worker generated by the faculty and staff alone.

Taking all of these recommendations into account, **Table 7A.15-15** indicates the VMT generation thresholds to be applied to Additional Housing Alternative A.[47]

TABLE 7A.15-15
APPLICABLE BENCHMARKS AND NUMERIC SIGNIFICANCE THRESHOLDS

Traveller and Trip Type	Daily VMT per Capita	
	Benchmark (region-wide average)	Numeric Threshold of Significance (85% of benchmark)
Worker Home-Based-Work Daily VMT per Worker	16.18	13.75
Resident Home-Based Daily VMT per Capita	17.33	14.73

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

Campus Population

The typical weekday population on the Stanford campus is made up of students, faculty, staff, contractors and other onsite workers, visitors, and household members of students, faculty and staff residing on the campus. The provision of additional on-campus housing under Additional Housing Alternative A would not increase student enrollment or change the total number of employees on the campus in 2035. Additional Housing Alternative A would reduce the number of commuters traveling to the campus compared to the proposed 2018 General Use Permit. However, there would be a substantial increase in campus residential population under Additional Housing Alternative A compared to the proposed Project.

Table 7A.15-16 shows the changes in campus resident populations for Additional Housing Alternative A compared to the proposed Project. Additional Housing Alternative A would increase the total campus resident population by 6,246 persons compared to the campus resident population anticipated under the 2018 General Use Permit. Of this population, 3,694 new residents would be spouses and other household members in the added housing. Overall, campus residents would increase by 32 percent compared to the proposed Project.

The additional Stanford affiliates living on campus would no longer commute from off-campus so worker trip lengths would be shortened. The additional campus residents, including Stanford affiliates, spouses and other household members, would make trips to and from the campus for a variety of purposes, including work, school, recreation, shopping and entertainment. The campus resident populations presented in Table 7A.15-16 are limited to the study area defined by the SB 743 VMT Analysis prepared for the Draft EIR.

47 In addition to numeric comparisons to regional benchmarks. OPR presents a third approach that can be used to assess the significance of VMT -- evaluation of the change in total VMT caused by the project. OPR states the third method is useful when a project is likely to divert or substitute trips. This method was considered for evaluation of trips by visitors to the Stanford campus; however, it was determined that the method does not appear to be well-suited to the specifics of Additional Housing Alternative A. OPR has not provided guidance as to how an agency should assess significance using this method if the relevant visitor trips are not of the type that would be redistributed from one location to another.

TABLE 7A.15-16
CAMPUS RESIDENT POPULATIONS – ADDITIONAL HOUSING ALTERNATIVE A

Condition	Total Residents	Stanford Affiliates	Spouses & Other Household Members
Fall 2015 Existing Conditions	12,592	11,468	1,124
Fall 2018 Baseline	13,028	11,888	1,140
2018 General Use Permit (Project)	19,353	17,116	2,237
Additional Housing Alternative A	25,599	19,668	5,931
Change from 2018 General Use Permit	+6,246	+2,552	+3,694
	+32.3%	+15%	+165%

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

Fall 2035 VMT Generation - Additional Housing Alternative A

Using the methodology described in the Draft EIR (pages 5.15-153 to 5.15-154), estimates of worker and resident VMT for Fall 2035 were prepared for Additional Housing Alternative A using the following assumptions. Between Fall 2018 to Fall 2035, the campus is anticipated to add 6,288 employees and contractors with an increase in enrollment of 2,900 students. In 2035, the General Use Permit study area would include 29,915 employees and contractors and an enrollment of 19,513 students. The worker population including employees, contractors and students would be 49,428. These are the same growth assumptions used in the 2035 VMT analysis for the proposed Project.

However, under Additional Housing Alternative A, the campus resident population within the study area would increase by 12,571 persons including Stanford affiliates, spouses and other household members between Fall 2018 and Fall 2035. This represents an increase in resident population of 6,246 persons over the proposed Project.

In addition to an increase in the campus residents, the additional housing would create the need for more construction workers on the campus. For Additional Housing Alternative A, it was assumed that, on average an additional 50 construction workers would be on campus on a typical day.

The resulting Fall 2035 VMT for campus workers and residents is indicated in **Table 7A.15-17**. Additional Housing Alternative A home-based work VMT per worker, and home-based VMT per resident would be below the SB 743 thresholds, allowing a determination of less-than-significant impacts for Additional Housing Alternative A.

VMT Comparison and Conclusions

Table 7A.15-18 summarizes the SB 743 VMT calculations for the 2018 General Use Permit and Additional Housing Alternative A, focusing on average daily trips by Stanford-affiliated workers between their homes and the Stanford campus, and average daily trips by Stanford campus residents to all destinations. SB 743 VMT calculations are expressed as VMT per worker and VMT per resident. Adding on-campus housing would reduce the average daily VMT per worker by 7.0% under Additional Housing Alternative A, as compared to the proposed Project. These reductions represent fewer trips by Stanford affiliates traveling to and from the campus for work and shorter trip lengths for those Stanford workers living on campus.

TABLE 7A.15-17
FALL 2035 TYPICAL WEEKDAY VMT – ADDITIONAL HOUSING ALTERNATIVE A

Traveler	Trip Purposes	Population	VMT	VMT per Person[a]	SB 743 Threshold VMT per Person (see Table 7A.15-15)	Finding
Workers	HBW	49,479	208,483	4.21	13.75	Less than Significant
Residents	HBW + HBO	25,599	316,926	12.38	14.73	Less than Significant

[a] Worker HBW trips were adjusted by +2% and Resident HB trips were adjusted by +3% to reflect changes in trip length derived from the VTA model.

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

TABLE 7A.15-18
COMPARISON OF SB743 VEHICLE MILES TRAVELLED

Condition	Worker w/ Student		Residents	
	VMT	VMT/Worker	VMT	VMT/Resident
2018 General Use Permit (Project)	223,842	4.53	207,986	10.75
Additional Housing Alternative A	208,483	4.21	316,926	12.38
Change from 2018 General Use Permit	-15,359	-0.32	+108,940	+1.63
	-6.9%	-7.0%	+52%	+15%

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

The addition of on-campus housing would increase the average daily VMT per resident by 15% under Additional Housing Alternative A, as compared to the proposed Project. Campus residents include Stanford affiliates, spouses and other household members living in the campus housing units. The daily VMT of residents is for all trip types including work, shopping, recreational, school (K-12), etc. The increase in VMT per resident would be due to the change in the on-campus proportion of faculty/staff housing units as compared to student beds. Faculty/staff units generate higher VMT per resident than student beds.

Impact Evaluation

Impact 7A.15-12: Additional Housing Alternative A would be located within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor. (*Less than Significant*)

As explained above, OPR has proposed that lead agencies generally should presume that residential, retail, and office projects, as well as mixed-use projects that are a mix of these uses, proposed within one-half mile of an existing major transit stop or an existing stop along a high-quality transit corridor have a less-than-significant impact on VMT. A major transit stop is a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A high-quality

transit corridor means a corridor with fixed route bus with service intervals no longer than 15 minutes during peak commute hours.

Given the major transit stops and stops along high quality transit corridors on and near the Stanford campus, and land area with ½ mile of such stops and corridors, development under Additional Housing Alternative A would constitute infill development that represents increased intensity and density compared to existing levels at Stanford. Stanford is located adjacent to Caltrain stations, and is well-served by transit. Based on the *Revised Proposed Changes to the CEQA Guidelines* proposed by OPR for assessment of VMT, like the proposed Project, Additional Housing Alternative A can be presumed to result in a less-than-significant impact.

Mitigation: None required.

Impact 7A.15-13: Additional Housing Alternative A VMT would not exceed the numeric thresholds recommended by OPR. (*Less than Significant*)

Even though Additional Housing Alternative A would be presumed to result in a less-than-significant impact under OPR's proposed CEQA Guidelines amendments (see Impact 7A.15-12, above), this EIR also assesses Additional Housing Alternative A's consistency with the numeric significance thresholds suggested by OPR.

Worker and residential daily VMT per capita generated by Additional Housing Alternative A in 2035 and the VMT Thresholds of Significance are shown in Table 7A.15-17. Additional Housing Alternative A home-based work VMT per worker, and home-based VMT per resident are below the significance thresholds, resulting in a less-than-significant impact on VMT.

Mitigation: None required.

Utilities and Service Systems[48]

Approach to Analysis

Water Supply

Project Water Demand

Similar to the WSA prepared for the proposed Project, the WSA for Additional Housing Alternative A used pre-drought conditions (Fiscal Year 2012-13) as the starting point because this captures pre-project conditions more accurately than subsequent years during which drought conditions temporarily but substantially affected campus water usage. The 2012-13 water usage

48 The Additional Housing Alternative A environmental analysis presented herein relies in part on a housing alternatives Water Supply Assessment (WSA) prepared by Schaaf & Wheeler Consulting Civil Engineers for Stanford (see Appendix ALT-WSA in this document), a wastewater analysis prepared by Stanford (see Appendix ALT-WAW); and a solid waste analysis prepared by Stanford (see Appendix ALT-SOL). These analyses were independently peer reviewed by ESA.

were increased as appropriate to account for the remaining development that would occur under the 2000 General Use Permit, and the increase in water demand that would be associated with development under this alternative. Compared to the proposed Project, Additional Housing Alternative A included increased potable water demand with the additional student housing and faculty/staff housing, using the same housing water demand rates for these categories as used in the WSA for the proposed Project. Although it is possible that additional housing constructed for this alternative may replace some existing landscaping, the WSA conservatively assumed there would be no change in irrigation demand from the analysis for the proposed Project.

Total Projected Water Demand and Supply

Table 7A.16-1 presents a summary of actual water demands and supplies for FY 2012-13 and FY 2015-16, and the projected water demands and supplies in 2035 with buildout of Additional Housing Alternative A.

TABLE 7A.16-1
SUMMARY OF POTABLE AND NON-POTABLE WATER SUPPLY AND DEMAND (MILLION GALLONS/DAY) – ADDITIONAL HOUSING ALTERNATIVE A

Water Use Category	FY 2012-13 (Pre-Drought) Actual	FY 2015-16 (Actual)	2035 Projected (with buildout of Additional Housing Alternative A)
Demand			
Potable	2.10	1.39	2.98
Non-Potable	1.23	0.81	1.35
Total	**3.33**	**2.20**	**4.33**
Supply			
Potable	2.91	2.91	3.03
Groundwater	1.52	1.52	1.52
Surface Water	1.12	1.12	1.12
Total	**5.55**	**5.55**	**5.67**

NOTES: Numbers are rounded.

SOURCE: Schaaf & Wheeler, 2018 (Appendix ALT-WSA)

Dry-Year Scenarios

In order to determine the adequacy of water supplies to meet project demand in non-normal or wet weather years, the WSA for Additional Housing Alternative A also considered Stanford's projected water demands and supplies for normal, single dry, and multiple dry water years; see **Table 7A.16-2** with buildout of Additional Housing Alternative A in 2035. As was the case for the proposed Project, the projection of non-potable usage for this alternative assumes that surface water is the primary source of irrigation supply, and groundwater is used to meet the remaining demand.

With respect to dry years, in its 2015 UWMP, the SFPUC advises wholesale customers to anticipate seeing their supply allocations reduced to as low as 83 percent of normal for a single dry year. In multiple dry year scenarios, supply might be further reduced to 72 percent of normal. Therefore, as was assumed for this alternative's analysis, the assumed dry-year supply projections assumed for Additional Housing Alternative A are based on the 83 percent and 72 percent planning factors from the SFPUC.

TABLE 7A.16-2
SUMMARY OF PROJECTED DRY YEAR SUPPLY AND DEMAND - ADDITIONAL HOUSING ALTERNATIVE A

Water Use Category	Water Year Type				
	Normal Year	Single Dry Year	Multiple Dry Years		
			1	2	3
Supply					
Potable Supply (SFPUC)					
ISG[a]	3.03	2.51	2.51	2.18	2.18
ISL[b]	2.91	2.42	2.42	2.10	2.10
Surface Water Supply	1.12	0.94	0.94	0.06	0.06
Groundwater Supply	1.52	1.52	1.52	1.52	1.52
Total Supply (ISG)	**5.67**	**4.97**	**4.97**	**3.76**	**3.76**
Total Supply (ISL)	**5.55**	**4.88**	**4.88**	**3.68**	**3.68**
2035 Demands					
Potable Demand	2.98	3.00	3.00	2.53	2.23
met by ISL	2.98	2.51	2.51	2.18	2.18
met by groundwater	0.00	0.49	0.49	0.35	0.05
Non-potable Demand	1.35	1.42	1.42	1.08	1.08
met by surface water	1.12	0.94	0.94	0.06	0.06
met by ground water	0.23	0.48	0.48	1.02	1.02
Total Demand	**4.33**	**4.42**	**4.42**	**3.61**	**3.31**

NOTES: Numbers are rounded.

[a] ISG = Individual Supply Guarantee allocation from SFPUC
[b] ISL = Interim Supply Guarantee Limitation allocation from SFPUC

SOURCE: Schaaf & Wheeler, 2017 (Appendix ALT-WSA)

Impact 7A.16-1: Additional Housing Alternative A would result in the expansion of existing on-campus infrastructure, the construction of which could cause significant environmental effects. (*Significant*)

As with the proposed 2018 General Use Permit, Additional Housing Alternative A would accommodate construction of campus infrastructure improvements to support new development that would occur under the alternative, including water and wastewater improvements. Since this alternative would involve more on-campus housing development and infrastructure than the proposed Project, it would therefore, involve also more construction than would occur under the proposed Project.

These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. As with the proposed Project, since on-campus utility improvements are part of the overall anticipated development program under the alternative, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses above under Air

Quality, Biological Resources, Cultural Resources, Noise and Vibration, and Transportation and Traffic. Similar to those mitigation measures identified for the proposed Project, the mitigation measures outlined in these respective topics for this alternative to reduce construction related impacts would similarly apply to infrastructure improvements.

Mitigation: Implement the following mitigation measures, as needed for construction of infrastructure improvements:

Air Quality

Mitigation Measure 7A.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 7A.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 7A.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 7A.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 7A.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 7A.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 7A.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 7A.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 7A.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 7A.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 7A 3-11(a)-(c): *Mitigation for protected trees during construction.*

Cultural Resources

Mitigation Measure 7A.4-2(a)-(b): *Mitigation for protection of archaeological resources during construction.*

Mitigation Measure 7A.4-3: *Mitigation for protection of paleontological resources during construction.*

Hazardous Materials

Mitigation Measure 7A.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 7A.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 7A.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 7A.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 7A.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 7A.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Impact 7A.16-2: Additional Housing Alternative A development would increase the demand for water, however it would be adequately supplied from existing entitlements and resources. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated water demand than the proposed 2018 General Use Permit. As discussed in Section 5.16, Utilities and Service Systems, Stanford receives its water from water purchased wholesale from the SFPUC, local surface water supplies, and groundwater. The WSA prepared for this alternative (see Approach to Analysis, above) evaluated if the total projected water supplies, determined to be available for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with this alternative.

With respect to normal years, as summarized in Table 7A.16-1, the WSA estimated that Stanford's total water demand upon buildout of this alternative would be approximately 4.33 mgd, consisting of a potable water demand of 2.98 mgd (an increase of 0.54 mgd over the proposed Project), and a non-potable water demand of 1.35 mgd (same as the proposed Project).

Consistent with the WSA prepared for the proposed Project, Stanford's overall water supply with buildout of this alternative would be similar to conditions at present. Stanford's potable water supply allocation from the SFPUC will be 3.03 mgd in 2018, when the ISL expires and the ISG is reinstated. During normal water years, this water allocation would be sufficient to accommodate the potable water demand through buildout of this alternative. Stanford would also maintain existing water rights for surface water diversion of non-potable water of up to 1.12 mgd. In addition, a sustainable groundwater supply of up to 1.52 mgd would be available to provide a supplemental source of non-potable water to serve the alternative. Together, the local surface and groundwater sources would be sufficient to accommodate the non-potable water demand through buildout of the alternative. Collectively, during normal water years, the total estimated water

supply 5.67 mgd would be more than adequate to accommodate the total projected water demand of 4.33 mgd with buildout of the alternative.

As shown in Table 7A.16-2, under this alternative, in single and multiple dry water year scenarios, Stanford would need to supplement its potable water supply from SFPUC with treated groundwater from its wells in order to accommodate the estimated increase in potable water demand from the additional on-campus housing.[49] As under the proposed Project, in multiple dry year scenarios, Stanford would reduce its total potable water demand by 15 percent in the second year and 25 percent in the third year.

Similar to the proposed Project, under this alternative in a single dry year, Stanford's non-potable water demands for plant irrigation would be expected to increase slightly. However, as under the proposed Project, under this alternative, Stanford would implement water conservation measures to reduce non-potable water use by 20 percent in the second and third years of a multiyear drought.

In conclusion, as was the case with the proposed Project, there would be sufficient water supplies to accommodate the water demand from buildout of Additional Housing Alternative A through existing entitlements and resources under normal, single dry, and multiple dry water years. Thus, while this alternative would generate an increased demand for water compared to the Project, this impact would be similarly less than significant.

Mitigation: None required.

Impact 7A.16-3: Additional Housing Alternative A would increase demand for wastewater treatment, but would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated wastewater generation, and correspondingly, and increased need for wastewater treatment, than the proposed 2018 General Use Permit. As discussed in Section 5.16, wastewater generated by Stanford is conveyed off-site to the City of Palo Alto Regional Wastewater Quality Control Plant (RWQCP) for treatment. The RWQCP is owned and operated by the City of Palo Alto, and is funded by several partners, including Stanford.

The analysis of wastewater generation for the proposed Project presented in Section 5.16, Utilities and Service Systems, used a highly conservative methodology that assumed the entirety of the net increase in potable water demand for the proposed Project would become wastewater. However, new data provided by Stanford based on historic metering of Stanford's wastewater flows shows that Stanford's average annual wastewater demand is approximately 70 percent of its

[49] In a single dry water year / multiple dry water year 1, multiple dry water year 2, and multiple dry water year 3, the WSA estimates Stanford would provide treated groundwater from its wells to supplement the amounts of 0.49 mgd, 0.35 mgd, and 0.05 mgd, respectively.

average annual domestic water usage. This is considered a more refined approach to estimate wastewater flows attributable to the proposed Project and additional housing alternatives. Use of the 70 percent factor for these scenarios would still be conservative, since it does not account for future conservation measures, such as improved connectivity to the campus recycled water system to these uses, which could serve to further reduce future wastewater flows from the campus.

Using this refined methodology for estimating wastewater generation for the proposed 2018 General Use Permit, Stanford's total projected potable wastewater generation in 2035 with the proposed 2018 General Use Permit would be 1.52 mgd wastewater (this includes wastewater flows from existing development, remaining development to be built under the 2000 General Use Permit plus new development under the proposed Project). These total flows would be within the 2.11 mgd capacity of the RWQCP owned by Stanford. Thus, while development under the proposed 2018 General Use Permit would increase demand for wastewater treatment, the increase would be within its authorized volumes, and would not exceed wastewater treatment requirements by the RWQCB. Consequently, similar to the finding reached in Section 5.16, the proposed Project would generate a less-than-significant impact to wastewater treatment.

Similarly, using this refined methodology for estimating wastewater generation for Additional Housing Alternative A, Stanford's total projected potable wastewater generation in 2035 with this alternative would be 1.90 mgd wastewater, an increase of 0.38 mgd over the proposed Project). These total flows would be within the 2.11 mgd capacity of the RWQCP owned by Stanford. Thus, similar to the proposed Project, while development under this alternative would increase demand for wastewater treatment, the increase would be within its authorized volumes, and would not exceed wastewater treatment requirements by the RWQCB. Consequently, as with the proposed Project, this alternative would generate a less-than-significant impact to wastewater treatment.

Mitigation: None required.

Impact 7A.16-4: Additional Housing Alternative A would discharge additional flows to the municipal sewer and drainage system, but not to an extent which would exceed the facilities' capacity in light of existing commitments. (*Less than Significant*)

Additional Housing Alternative A would involve more on-campus housing and associated wastewater generation than the proposed 2018 General Use Permit. Wastewater generated by Stanford is collected in its sanitary sewer system and then conveyed off-site to and through City of Palo Alto sewer lines to the RWQCP. Using the refined methodology for estimating wastewater generation presented in Impact 7A.16-3, above, for the proposed 2018 General Use Permit, an increase in Stanford wastewater generation of approximately 0.42 mgd (conservatively accounting for the proposed 2018 General Use Permit increase and contribution from any remaining unbuilt development under 2000 General Use Permit), would be equivalent to an average increase in daily flow of approximately 292 gpm. This increased flow added to measured dry weather peak flow of 1,700 gpm would remain well below this City sewer main's capacity at 4,370 gpm.

Using the same refined methodology for this alternative, an increase in Stanford wastewater generation of approximately 0.80 mgd (accounting for the alternative and contribution from any remaining unbuilt development under 2000 General Use Permit), would be equivalent to an average increase in daily flow of approximately 556 gpm (an increase of 264 gpm over the proposed Project). Similar to the proposed Project, this increased flow added to measured dry weather peak flow of 1,700 gpm would remain well below this City sewer main's capacity at 4,370 gpm.

Given these results, and considering that the City of Palo Alto indicates there are no capacity deficiency issues for any of the City collection mains that carry wastewater flows from the campus to the RWQCP, the increase in flow under this alternative, would not exceed the City of Palo's sewer collection capacity. Similar to the conclusion reached for the proposed Project, the impact under this alternative would be less than significant.

Mitigation: None required.

Impact 7A.16-5: Additional Housing Alternative A construction would result in an increased generation of solid waste, but would not exceed permitted capacity to accommodate the Project's solid waste disposal needs or conflict with federal, State, and local statutes and regulations related to solid waste. *(Less than Significant*)

Additional Housing Alternative A would involve more construction and demolition activities than the proposed 2018 General Use Permit and consequently, would generate more construction debris, some of which would require disposal. The alternative would be expected to result in an average of approximately 360,500 square feet of construction (an increase of 135,000 square feet over the proposed Project) and approximately 53,850 square feet of demolition (an increase of 3,550 square feet over the proposed Project) per year through 2035. Based on the most conservative construction and demolition waste estimates provided by the USEPA (similar to those estimated for the proposed Project in Section 5.16), the annual construction and demolition under this alternative would result in an estimated 5,045 tons of solid waste per year (an increase of 576 tons per year over the proposed Project). Assuming 50 percent of all construction waste is diverted from landfills through source reduction, recycling, and composting activities per Stanford procedures and policies, consistent with CCR Title 24, the Project would generate an estimated 2,523 tons of waste per year (an increase of 288 tons per year over the proposed Project) that would be disposed at a landfill.

As discussed in Section 5.16, as of 2012, Zanker Road Landfill (which currently receives construction/demolition debris from Stanford) had a total remaining capacity of 700,000 cubic yards with an expected closure date of 2029. In addition, other existing landfills are available that would remain operational could be utilized and would have more than adequate capacity to accommodate the construction debris generated by this alternative. As a result, similar to the proposed Project, construction debris generated under this alternative would not exceed permitted landfill capacity nor violate any state or federal regulation related to solid waste, and similar to the proposed Project, the impact from this alternative would be less than significant.

Mitigation: None required.

Impact 7A.16-6: Operation of Additional Housing Alternative A would comply with federal, state, and local statutes and regulations related to solid waste and would be adequately served by existing landfills with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (*Less than Significant*)

Additional Housing Alternative A would involve more housing development, and consequently, would generate more solid waste than the proposed 2018 General Use Permit requiring disposal. Using the same per capita generation rates as those used for the proposed Project in Section 5.16, this alternative would generate a net increase of approximately 9,115 tons of discards per year (an increase of 2,734 tons over the proposed Project), consisting of approximately 3,326 tons of landfill waste per year (an increase of 998 tons over the proposed Project), and 5,789 tons of recyclables per year (an increase of 1,736 tons over the proposed Project). When considered in combination with the existing waste generation, Stanford would generate approximately 33,800 tons of discards per year, consisting of 12,271 tons of landfill waste per year, and 21,529 tons of recyclables per year with this alternative.

As discussed in Section 5.16, the Newby Island Sanitary Landfill (which currently receives the majority of Stanford's solid waste) has maximum permitted throughput for up to 4,000 tons of waste per day. Similar to the proposed Project, the total operational solid waste that would be generated under this alternative that requires landfilling would represent less than one percent of the maximum daily permitted throughput at this landfill. Furthermore, this landfill has a remaining capacity of 21.2 million cubic yards, with an anticipated closure in January 2041; and therefore can accommodate solid waste disposal needs of the Project through the duration of this alternative.

Based on the existing disposal rates and continued waste diversion by residents and employees of Stanford, this alternative, similar to the proposed Project, would continue to allow Stanford be in compliance with CALGreen and AB 939. Given the above, operation of this alternative would not exceed available permitted landfill capacity and would comply with federal, state, and local statutes and regulations related to solid waste diversion; and similar to the proposed Project, the impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7A.16-7: Implementation of Additional Housing Alternative A, in combination with past, present, and future projects would contribute to cumulative increases in demand for water supplies. (*Less than Significant*)

The WSA for Additional Housing Alternative A demonstrates there, similar to that determined for the proposed Project, there are adequate water supplies to accommodate the water demand from buildout of this alternative through existing entitlements and resources under normal and sequentially dry weather years.

As discussed in Section 5.16, Stanford provides usage statistics and demand projections to the SFPUC and SCVWD who incorporate this data into their respective UWMPs. The SFPUC and SCVWD UWMPs, as well as the City of Palo Alto's 2015 UWMP, indicate that each urban water supplier has sufficient water supply to meet demand in normal years and sequential dry-weather years. The SFPUC's 2015 UWMP considers that Stanford's purchase requests will increase, and the SCVWD UWMP also includes increases in Stanford's total water demand projections. The WSA prepared for this alternative determined that the Stanford's projected potable water demand for this alternative, while higher than the proposed Project, would still be met through Stanford's ISG under normal water years, and could be supplemented with treated groundwater in single or multiple dry water years. The WSA showed Stanford's non-potable water demand under this alternative would be similar to the Project, and would continue to be met by existing surface water entitlements and groundwater.

Similar to the proposed Project, the cumulative water supply needs of this alternative in combination with past, present, and reasonably foreseeable projects within the SFPUC wholesale service territory during normal, single-, and multiple-dry years could be met by 1) State voluntary and mandatory water conservation and water efficiency measures, 2) SFPUC voluntary and mandatory water conservation and water efficiency measures, 3) City water conservation measures called for in the municipal code and emergency conservation ordinance, 4) BAWSCA's long-term water supply strategy, and 5) SFPUC's WSIP improvements as identified in each of their UWMPs.

Cumulative projects would contribute to additional water demands. However, future projects would be subject to the same water conservation efforts, water efficiency measures, and water supply improvements to balance supply and demand as would this alternative required by the state and regional enforcement bodies. In particular, cumulative projects within the SFPUC wholesale service area would be subject to State and SFPUC voluntary and mandatory conservation measures to reduce usage, the BAWSCA's long-term water supply strategy to enhance supplies, and the SFPUC's WSIP projects to improve the regional water system reliability and capacity. There would be adequate water supplies to serve this alternative in combination with other reasonably foreseeable projects in the SFPUC wholesale service area.

Therefore, cumulative impacts to water supply would be less than significant.

Mitigation: None required.

Impact 7A.16-8: Implementation of Additional Housing Alternative A, in combination with past, present, and future projects would contribute to cumulative increases in demand for wastewater treatment. (*Less than Significant*)

The cumulative setting for wastewater treatment would extend to the entire service area of the RWQCP. Under each of the growth scenarios considered in the update to the City of Palo Alto's Comprehensive Plan, future wastewater generation would increase by less than five percent of the available treatment capacity at the RWQCP, which would be far below its design and permitted wastewater treatment capacity. As addressed under Impact 7A.16-3, similar to that determined for the proposed Project, the future increases in wastewater flows from this alternative would be within the 2.11 mgd capacity permitted by the RWQCP for Stanford's use.

Based on the cumulative wastewater treatment demand anticipated under buildout of the 2030 Comprehensive Plan, demand generated by residents within Palo Alto, Stanford, and the remaining service area for the RWQCP would be below the facility's excess capacity. As a partner in the RWQCP, Stanford pays it fair share of capital costs, and would continue to do so over the life of this alternative.

With adequate capacity for cumulative wastewater treated at RWQCB, treatment would be provided according to the wastewater treatment requirements documented in the NPDES permit for the RWQCP and enforced by the San Francisco RWQCB. Therefore, cumulative development combined with this alternative would not exceed wastewater treatment requirements, and cumulative impacts to wastewater treatment would be less than significant.

Mitigation: None required.

Impact 7A.16-9: Implementation of Additional Housing Alternative A, in combination with past, present, and future projects would contribute to cumulative increases in demand for landfill space. (*Less than Significant*)

While Stanford currently relies primarily on the Newby Island Sanitary Landfill and Zanker Road Class III landfill, countywide, there are 20 additional landfills for which capacity is available. All past, present, and foreseeable future projects have been and would be required to demonstrate that adequate landfill capacity is available to accommodate increased waste prior to any project approvals. Such projects have been and would also be required to comply with the recycling and reuse measures and targets established by CALGreen and AB 939 for construction and operational waste. Therefore, this alternative, in conjunction with other development, would not have a significant cumulative impact associated with solid waste, and this alternative's cumulative impact would be less than significant.

Mitigation: None required.

Environmental Consequences of Stanford Providing Off-Campus Housing under Additional Housing Alternative A

Impact 7A.17-1: Under Additional Housing Alternative A, the construction and/or operation of off-site housing by Stanford would result in off-site environmental impacts. (*Significant*)

Although Additional Housing Alternative A assumes that all new housing would be provided on-campus, under this alternative, Stanford could elect to, subject to approval by the County, offset some or all of the incremental off-campus housing demand by providing off-campus housing. The growth in Stanford student, faculty, staff, postdoctoral student, and other worker households that would live off-site would be distributed among many jurisdictions in the Bay Area. Assuming that future off-campus residents distribute in patterns similar to how current off-campus residents live, these jurisdictions are listed in Draft EIR Table 5.12-11.

With respect to affordable housing, as under the proposed Project, affordable housing impact in-lieu payments could be made under this alternative would support development of affordable housing within one-half mile of any major transit stop or a high-quality transit corridor in the Bay Area.

Based upon Stanford's historical development of off-campus housing projects in the cities of Palo Alto, Menlo Park, and Los Altos, and the location of residence of existing Stanford affiliates based on Stanford's 2016 Commute Survey, the potential indirect impacts of distributing the Additional Alternative A's off-campus housing demand within the cities of Palo Alto, Menlo Park, and Mountain View provide a representative analysis of the indirect impacts that would more broadly occur among the Bay Area jurisdictions. Specifically, as described in the Draft EIR, Palo Alto is currently home to approximately 19 percent of off-campus students, faculty, and staff; Menlo Park has 9 percent; and Mountain View has nearly 10 percent.[50] Therefore, the potential effects of any off-campus housing development projects that Stanford would potentially provide under Additional Housing Alternative A would disproportionately affect these jurisdictions compared to other communities in the Bay Area that house Stanford affiliates.

All three cities have adopted updates to their respective general plans within the last six years. The effects of population growth expected to occur during the next several decades resulting from such growth, including from residential housing development that may be associated with Stanford off-campus housing demand, have been analyzed in the Final EIRs for each respective general plan. While there are differences regarding how the analyses were conducted and how they are described in the Final EIRs for each plan, significant impacts were identified for all three communities regarding air quality and transportation. It is reasonable to assume that the general plans for these communities accounted for the population growth associated with Stanford affiliates residing within each respective jurisdiction and that any off-campus housing provided by Stanford in more distant communities would have similar impacts as those identified below. Of course, the effects of population growth anticipated in those three Final EIRs include the impacts of all growth, only some of which could be growth caused indirectly by this alternative.

[50] Stanford University 2018 General Use Permit Draft EIR Appendix PHD, Table 13.

Any new off-campus housing constructed as result of this alternative, including affordable housing units, would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. For purposes of this EIR, the impacts associated with the demand for off-site housing units are being analyzed as indirect impacts of this alternative.

Palo Alto adopted an update to its general plan, *Comprehensive Plan 2030*, on November 13, 2017 (City of Palo Alto, 2017a). The Final EIR prepared for the update analyzed six unique scenarios for growth in Palo Alto through 2030 (City of Palo Alto, 2017b). The total number of new housing units constructed by 2030 under the six scenarios ranged from a low of 2,720 under the "business as usual" scenario to 6,000 units under the most aggressive housing scenario. The City Council developed a "Preferred Scenario" that would result in 3,545 to 4,420 new housing units in the city by 2030.

The effects of such growth anticipated to occur under the general plan update were considered in the Final EIR. Most impacts were determined to be less than significant through implementation of identified mitigation measures. However, several impacts related to air quality and transportation/traffic were determined to remain significant and unavoidable, as summarized below:

- AIR-2: Implementation of the proposed Plan could violate an air quality standard; contribute substantially to an existing or project air quality violation; and/or result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). (All Six Scenarios)

- TRANS-1: Implementation of the project would cause an intersection to drop below its motor vehicle level of service standard, or deteriorate operations at representative intersections that already operate at a substandard level of service. (Six Scenarios)

- TRANS-3: Implementation of the project would cause a freeway segment or ramp to drop below its level of service standard, or deteriorate operations that already operate at a substandard level of service. (All Six Scenarios)

- TRANS-6: Implementation of the project would impede the operation of a transit system as a result of congestion. (All Six Scenarios).

Regarding air quality, implementation of the general plan under all scenarios would generate a substantial increase in criteria air pollutant emissions from on-site sources, vehicle trips, and energy use, which would result in a significant, unmitigable impact. Emissions generated during construction associated with individual development projects permitted under the proposed plan also would generate significant levels of criteria air pollutants and toxic air contaminants. Under all six scenarios, the plan would cause multiple intersections to drop below their motor vehicle level of service standard, or deteriorate operations at intersections that already operate at a substandard level. Up to eight intersections were determined to have significant intersection impacts, and seven freeway segments or ramps on U.S. 101 and I-280 also would drop below

level of service standards. In addition, the degradation in level of service would impede the operation of a transit system as a result of congestion.

City of Menlo Park

Menlo Park adopted its current general plan, *ConnectMenlo*, on November 29, 2016 (City of Menlo Park, 2016a). In addition to the proposed plan and no project alternatives, the Final EIR analyzed two reduced intensity scenarios (City of Menlo Park, 2016b). The number of housing units that could be constructed by 2040 ranged from 1,000 under the no project-business as usual alternative to 5,500 units under the proposed plan. The Final EIR prepared for the general plan identified significant and unavoidable impacts for air quality, GHG emissions, transportation and circulation, and population and housing (cumulative), as summarized below:

- AQ-2a: Despite implementation of the proposed project policies as identified in Chapter 4.2, Air Quality, Table 4.2-8, criteria air pollutant emissions associated with the proposed project would cause a substantial net increase in emissions that exceeds the Bay Area Quality Management District (BAAQMD) regional significance thresholds.

- AQ-2b: Despite implementation of the proposed project policies, criteria air pollutant emissions associated with the proposed project construction activities would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.

- AQ-5: Despite implementation of the General Plan policies, criteria air pollutant emissions associated with the General Plan would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.

- GHG-1: The proposed project would result in a substantial increase in GHG emissions from existing conditions by the proposed General Plan horizon year 2040 and would not achieve the 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Additional state and federal actions are necessary to ensure that state and federally regulated sources (i.e., sources outside the City's jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the 2050 target.

- GHG-2: While the proposed project supports progress toward the long term-goals identified in Executive Order B-30-15 and Executive Order S-03-05, it cannot yet be demonstrated that Menlo Park will achieve GHG emissions reductions that are consistent with a 40 percent reduction below 1990 levels by 2030 or an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs.

- POP-4: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in a significant cumulative impacts with respect to population and housing.

- TRANS-1a: Implementation of the proposed project would exceed the City's current impact thresholds under the 2040 Plus Project conditions at some roadway segments in the study area.

- TRANS-1b: Implementation of the proposed project would result in increased delay to peak hour motor vehicle traffic exceeding the significance threshold at some of the study intersections.

- TRANS-2: Implementation of the proposed project would result in impacts to Routes of Regional Significance.

- TRANS-6a: Implementation of the proposed project would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system.

- TRANS-6b: The project would generate a substantial increase in transit riders that cannot be adequately serviced by existing public transit services, and the project would generate demand for transit services at sites more than one-quarter mile from existing public transit routes.

Similar to the determination of Palo Alto's Final EIR, implementation of Menlo Park's general plan would result in generation of criteria air pollutant emissions that would result in significant impacts during construction and operation. GHG emissions were determined to be significant and unavoidable as the emissions generated would not achieve a 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Five significant impacts were identified for transportation: exceedances of impact thresholds at roadway segments; increased delay to peak hour motor vehicle traffic thresholds; impacts to Routes of Regional significance; inadequate provision of pedestrian or bicycle facilities; and generation of a substantial increase in transit riders that cannot be adequately served by existing public transit services.

City of Mountain View

Mountain View's *2030 General Plan* (adopted July 10, 2012) determined that 8,970 new housing units could be developed in the city by 2030 (City of Mountain View, 2012a). The general plan Final EIR identified significant impacts for Air Quality, Noise, and Transportation, as summarized below (City of Mountain View, 2012b):

- TRANS-1: Implementation of the Draft General Plan and GGRP would result in increased daily land-use-based vehicle miles of travel (VMT) per service population in 2030 due to population and employment growth planned within the City.

- TRANS-2a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on one roadway study segment (39. San Antonio Road between SB US 101 Ramps and Charleston Road).

- TRANS-2b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on several roadway study segments.

- TRANS-3a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.

- TRANS-3b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.

- TRANS-4a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.

- TRANS-4b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.

- AIR-2: Implementation of the Draft General Plan and GGRP could contribute to or result in a violation of air quality standards in the existing and cumulative conditions by increasing VMT greater than the population increase.

- AIR-4: Implementation of the Draft General Plan and GGRP would result in a cumulatively considerable net increase in ozone and particulate emissions.

- NOI-1: Increased traffic from projected development under the Draft General Plan and GGRP would result in a significant increase in traffic noise levels compared to existing conditions in the 2030 and cumulative conditions along some roadway and freeway segments in the City.

Regarding air quality, impacts would result from violation of air quality standards by increasing VMT greater than the population increase, and the cumulatively considerable net increase in ozone and particulate emissions. Increased traffic noise levels along some roadway and freeway segments would be significant. Significant transportation impacts included the following: increased daily land-use-based VMT due to population and employment growth; increased motor vehicle traffic and congestion, which would result in decreased roadway and freeway segments level of service; and increased motor vehicle traffic and congestion outside the city.

Conclusion

Although the above analysis focuses on the impacts in three cities where housing locations are reasonably foreseeable, similar impacts would likely occur in other Bay Area jurisdictions where off-campus housing would be located. As discussed above, any new off-campus housing that may be developed by Stanford under Additional Housing Alternative A would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. As such, the implementation of any mitigation measures to reduce associated environmental impacts, in particular those included in or required by General Plan EIRs, would depend on the actions of those jurisdictions.

> **Mitigation Measure 7A.17-1:** The local governmental agencies in which off-campus affordable housing that would be developed by Stanford would be located can and should mitigate the environmental impacts from off-campus housing to the extent feasible.
>
> **Significance after Mitigation:** Significant and Unavoidable.

Given uncertainties in the specific location and type of off-campus housing that may occur under this alternative, it is also uncertain if feasible mitigation would exist to reduce all significant environmental impacts to a less than significant level. Further, the County cannot require or guarantee that local governments would implement mitigation measures for off-campus housing included in or required by General Plan EIRs. For these reasons, the impact is determined to be significant and unavoidable.

Ability to Meet Project Objectives

Additional Housing Alternative A would fail to achieve the primary project objective to develop the campus in a manner that reflects Stanford's historical growth rates and the growth assumptions in Stanford's approved Sustainable Development Study. The additional housing contemplated by this alternative would exceed Stanford's historic growth rates and the assumptions in the Sustainable Development Study, and would result in more intense development and construction activity than has occurred over the past several decades. The alternative would add approximately 2.5 million square feet of development to the Stanford campus above the square footage proposed by the 2018 General Use Permit.

This alternative also would also not fully achieve the following more specific project objectives to: continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community; and prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing.

7.4.5 Additional Housing Alternative B[51]

Description

For the purposes of comparison and to assist the public and decision makers in understanding the implications of the construction of higher levels of housing on the Stanford campus, Additional Housing Alternative B considers the effects of provision of more on-campus housing than under the proposed Project, but less than under Additional Housing Alternative A. Except for provision of additional parking, all other components of the Proposed Project would remain the same for this alternative. For this reason, the analysis of Additional Housing Alternative B relies upon and incorporates by reference the description of the environmental setting, impact analyses, mitigation measures and significance conclusions for the proposed Project, in addition to analyzing the environmental effects of the increased housing included with this alternative.

Additional Housing Alternative B assumes a new general use permit would be sought for the same level of academic and academic support development (i.e., 2.275 million net new square feet). As described below, in addition to the proposed on-campus housing that would be provided under the proposed 2018 General Use Permit (3,150 units/beds), this alternative would include a requirement that Stanford provide an additional 1,275 units/beds on-campus housing to

51 The Additional Housing Alternative B description presented herein relies in part on a housing alternatives description prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-PRD included in this document.

accommodate the half net increase in off-campus housing demand that would occur under the proposed Project, for a total of 4,425 new on-campus housing units/beds.

Similar to Additional Housing Alternative A, under this alternative it is assumed that Stanford could instead elect to, subject to approval by the County, provide additional off-campus housing to meet the incremental demand created by the proposed 2018 General Use Permit. The specific amount, location and type of off-campus housing that would or could be provided are not known at this time. It would also represent a worst case as far as disclosure of reasonably foreseeable environmental effects of such housing. However, it is assumed that any portion of affordable off-campus housing provided by Stanford would be located within a six-mile radius of the campus. This is consistent with the 2000 General Use Permit Condition H.6(c).[52] Any new off-campus housing that could be proposed by Stanford under this option would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. Therefore, in order to conservatively assess the localized effects of meeting half the increase in housing demand of the proposed 2018 General Use Permit, this EIR assumes that all of the additional housing that would be developed under this alternative would be built on-campus. However, this EIR also provides a separate qualitative discussion of environmental consequences of Stanford providing additional off-campus housing under this alternative.

Similar to the proposed Project, this alternative also assumes the construction of 40,000 square feet of trip reduction amenities such as onsite childcare and mobility hubs; and up to 50,000 square feet of construction surge space. Additional Housing Alternative B assumes that, in addition to utilizing unbuilt parking authorized by the 2000 General Use Permit, 57 additional parking spaces would be needed for the 104 additional graduate student beds contemplated by this Alternative. As with the proposed Project, parking for faculty/staff housing would not count toward campus parking limits.

It is also expected that Stanford would request approval of infrastructure improvements that would be required to serve development under this alternative. Similar to the proposed Project, infrastructure improvements could include utilities and circulation improvements. As under the proposed Project, some utility and habitat improvements could occur outside the Academic Growth Boundary under this alternative.

Furthermore, the proposed adjustments to the No Net New Commute Trips compliance methodology that would occur under the Project would also occur under this alternative. However, it should be noted that because this alternative would shift a substantial number of commute trips to residential trips, the No Net New Commute Trips standard may not be achieved because TDM measures are not as effective in reducing residential trips, compared to commute trips.

[52] 2000 General Use Permit Condition H.6(c) required that cash payments made by Stanford in-lieu of providing affordable housing would be made to an escrow account established and maintained by the County for the purpose of funding affordable housing projects within a six-mile radius of the Stanford campus boundary.

Sustainability practices and programs that would be implemented under the proposed Project are also assumed to be implemented under this alternative.

On-Campus Housing

Table 7B-1 estimates the net increase in housing units under Additional Housing Alternative B. Table 7-7 first shows the projected increase in the number of Stanford affiliates (students, faculty, staff, postdoctoral students, and other workers[53]) who would live off campus during the 2018 General Use Permit period, and the estimates of the number of households that each of these increases in population would represent (see Section 5.12, Population and Housing, and Appendix PHD in the Draft EIR for additional detail). As shown in the Table 7B-1, the total projected daily population growth at Stanford predicted to occur during implementation of the 2018 General Use Permit is 8,162 Stanford affiliates. Of that number, 3,168 of those new Stanford affiliates would be housed in the proposed new on-campus housing. This leaves 4,994 new Stanford affiliates that would be housed outside the campus, which, after accounting for non-Stanford employed adults living in campus housing, would result in an estimated increase in demand for 2,425 off-campus housing units.

As shown in Table 7B-1, under Additional Housing Alternative B, half the off-campus housing demand generated under the proposed 2018 General Use Permit would instead be accommodated on campus, which would translate to an equivalent increase of 1,275 new on-campus housing units/beds (104 graduate student beds[54] and 1,171 units for postdoctoral students, faculty, staff, and/or other workers). When adding the 1,275 new on-campus housing units/beds to the new on-campus housing proposed under the proposed 2018 General Use Permit (i.e., 3,150 housing units/beds), this alternative would result in a total of 4,425 new on-campus housing units/beds. This alternative would achieve the housing linkage ratio that is proposed for the Project (and as with the Project, would have a greater number of housing units/beds than required by the housing ratio).

Distribution of Additional Housing

In order to assess the comparative effects of this alternative, it is necessary to make assumptions about the location on the campus of the additional increment of housing. As under the proposed Project, it is assumed that the additional increment of on-campus housing that would occur under this alternative would be located within the Academic Growth Boundary, and not within the Campus Open Space land use designation.

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53 This estimate does not include growth in non-matriculated students, estimated at 420 individuals under the proposed 2018 General Use Permit (see Draft EIR Table 5.12-9). Non-matriculated students are students taking courses or engaged in graduate-level research or training over the short term (ranging from a few hours to a few months), but who are not seeking a degree. They include students who complete courses entirely online, and students taking courses on a part-time basis. Consequently, while this population segment is accounted for in the overall population totals, it is not relevant to the anticipated demand for new housing.

54 If the increase in off-campus graduate students were housed on campus, they would be housed in student beds. As a result, the increase in 42 off-campus graduate student housing units was converted to an estimated 104on-campus student beds.

TABLE 7B-1
NET INCREASE IN HOUSING UNITS UNDER ADDITIONAL HOUSING ALTERNATIVE B

	Undergraduate Students	Graduate Students	Postdoctoral Students[a]	Faculty[b]	Staff[c]	Other Workers[d]	Total
Total Growth During 2018 General Use Permit (Daily)	1,700	1,200	961	789	2,438	1,074	8,162
Less: Number Housed on Campus[e]	(1,700)	(918)	N/A	(550)	N/A	N/A	(3,168)
Off-Campus Stanford Population Growth	0	282	961	239	2,438	1,074	4,994
Less: Non-Stanford Population in On-Campus Housing[f]	0	(72)	0	(418)	0	0	(490)
Net Increase in Off-Campus Population under 2018 General Use Permit	0	210	961	(179)	2,438	1,074	4,504
Calculation of Increase in Off-Campus Households under 2018 General Use Permit[g]	**0**	**83**	**449**	**(102)**	**1,385**	**610**	**2,425**
Calculation of One Half the Increase in Off-Campus Population[g]	**0**	**42**	**224.5**	**(51)**	**692.5**	**305**	**1,213**
Increase in Households if Beds are provided on Campus for Graduate Students rather than Off Campus Housing Units[h]		104					**1,275**
Household Adjustment Factor[g]	N/A	2.54/1.02	2.14	1.76	1.76	1.76	N/A

NOTES:
Totals shown may differ from the sums of individual numbers due to rounding.
N/A = Not applicable

[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.

[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.

[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.

[d] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.

[e] The on-campus housing included in the proposed 2018 General Use Permit is assumed to consist of housing for 1,700 undergraduate students and 918 graduate students along with 550 units for faculty or staff.

[f] Stanford predicts 72 non-student spouses would occupy the graduate student housing that would be included in the proposed 2018 General Use Permit. In addition, each of the 550 staff and faculty units would accommodate at least one member of the staff or faculty, along with any other members of the faculty or staff household. The Draft EIR analysis assumes an average of 1.76 workers per staff or faculty household, per footnote (g) below, resulting in an average of one faculty or staff member and 0.76 other workers per faculty or staff unit.

[g] For each population group, the Draft EIR makes a household adjustment factor in order to translate population growth into new households. For graduate students and post-doctoral scholars, the adjustment is based on the average number of employed adults per household, calculated from the 2016 Commute Survey conducted by the Stanford's Department of Parking and Transportation Services. For faculty and staff, the adjustment is based on the average number of employed residents per worker household for Santa Clara County, according to 2011-2015 American Community Survey data. The Draft EIR does not apply a household adjustment factor to the undergraduate population because the 2018 General Use Permit includes enough on-campus undergraduate beds to accommodate the entire increase in the number of undergraduate students.

[h] Of the 105 graduate students that would require beds on campus, it is likely that 2 percent of them would be married to Stanford-student spouses; therefore, 104 beds would be demanded.

SOURCE: Stanford University Land Use and Environmental Planning Office (see Appendix ALT-PRD)

Other factors considered in the distribution of additional housing under this alternative are the goals to keep the interior of the campus compact and walkable, and, consistent with the 1985 Land Use Policy Agreement,[55] keep any new multi-family housing that is occupied by non-Stanford affiliates outside the academic campus lands. The campus must remain compact and walkable so that students and faculty can travel between classes. In addition, there is a benefit for education and discovery when academic buildings are located close to one another, promoting cross-discipline exchange of information. Placing faculty/staff housing in and near the Campus Center Development District could create a barrier, or gap between existing or future academic buildings. Stanford also states that any new faculty/staff housing is likely to be placed on the outer edge of the academic campus because it is difficult to predict future housing demand and needs. If housing constructed for Stanford affiliates later needed to be converted to housing occupied by the general public, the housing sites would be subject to annexation by Palo Alto under the provisions of the 1985 Land Use Policy Agreement. Additional factors that would limit additional housing in the Lagunita Development District under this alternative include constraints posed by the Stanford Habitat Conservation Plan for land adjacent to Lagunita, and existing oak woodlands in the Lathrop Development District that constrain additional development in this district. Accordingly, it is assumed that no additional increment in on-campus housing under this alternative would be placed in the Campus Center, Lagunita and Lathrop Development Districts.

Graduate Student Beds Distribution

It is assumed that the additional increment of on-campus graduate student beds that would be developed under this alternative (104 beds) would be located in the East Campus Development District. This is the same location on campus where the most recently approved EV Graduate Residences are being constructed, and also where the 900 new graduate student housing units proposed under the 2018 General Use Permit are expected to be developed.

Faculty/Staff/ Postdoctoral Students/Other Worker Housing Distribution

Table 7B-2 and **Figure 7.B-1** present a summary of the distribution of development within the campus development districts assumed under Additional Housing Alternative B.

For the reasons described above in the section titled "Distribution of Additional Housing," it is assumed that the additional increment of on-campus housing for faculty, staff, postdoctoral students and/or other workers that would be developed under this alternative (1,171 units) would be located at the edges of the Quarry, West Campus, DAPER and Administrative, and/or East Campus Development Districts. This is similar to the approach taken by Stanford for the recently constructed faculty/staff housing on El Camino Real and Stanford Avenue, and the housing that would be developed in the Quarry Development District under the proposed 2018 General Use Permit.[56]

55 Please see https://www.sccgov.org/sites/dpd/Programs/Stanford/Pages/1985Policy.aspx.

56 This pattern is also similar to Stanford's practice of building off-campus housing near the edges of the campus in other jurisdictions, such as the Stanford West apartments, Welch Road apartments, and University Terrace project in Palo Alto.

TABLE 7B-2
ADDITIONAL HOUSING ALTERNATIVE B DEVELOPMENT DISTRIBUTION BY DEVELOPMENT DISTRICT

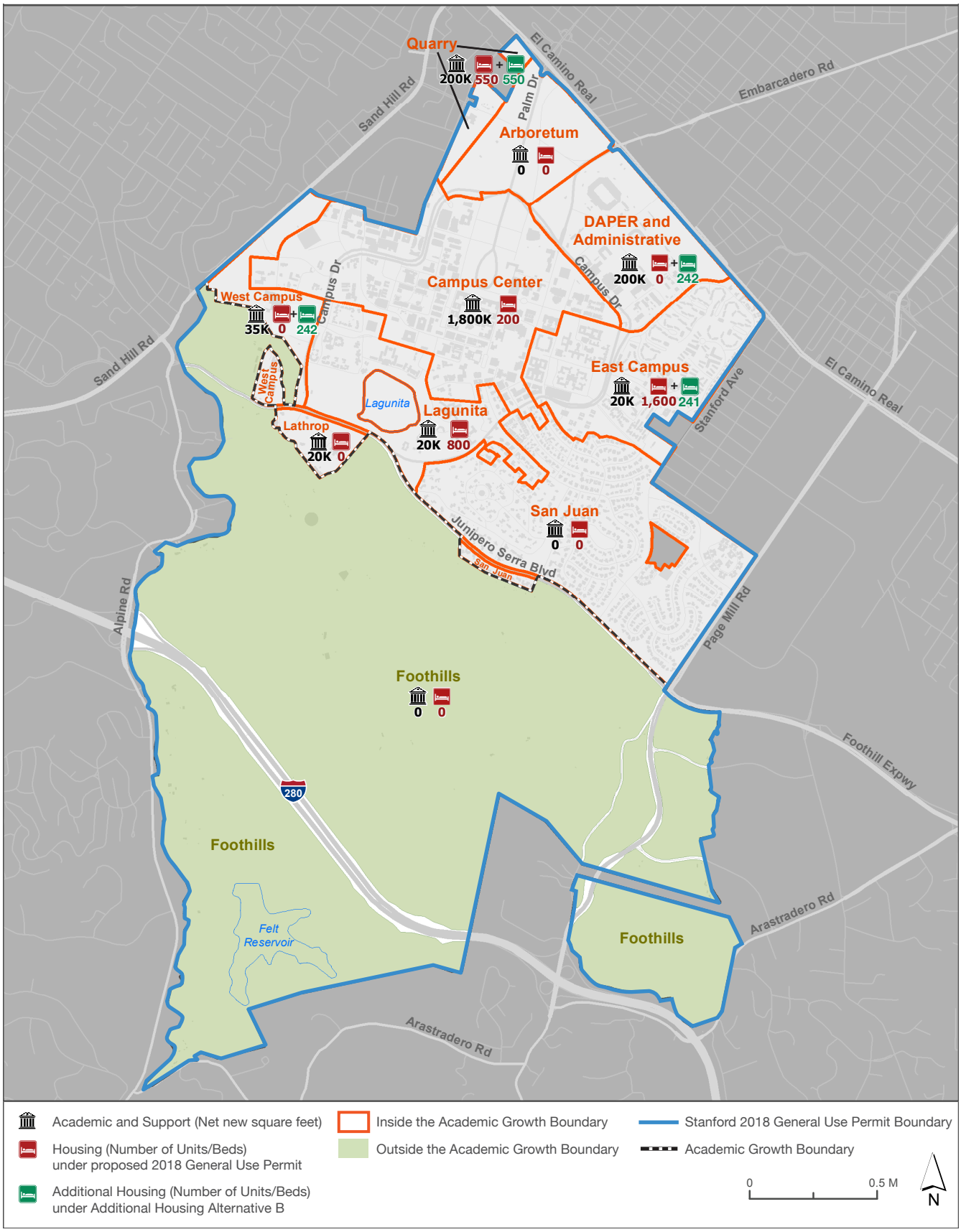
Development District	Net New Academic and Academic Support Space (Net New Square Feet)	Net Addition Housing Development (Number of Units/Beds)
Quarry	200,000	1,100
Arboretum	0	0
DAPER[a] & Administrative	200,000	242
Campus Center	1,800,000	200
East Campus	20,000	1,841
West Campus	35,000	242
Lagunita	20,000	800
Lathrop	20,000	0
San Juan	0	0
Foothills	0	0
Total	**2,275,000**	**4,425**

[a] DAPER = Department of Athletics, Physical Education, and Recreation

SOURCE: Stanford University Land Use and Environmental Planning Office, 2018

- 550 additional faculty, staff, postdoctoral student and/or other worker units would be located in the Quarry Development District (for a total of 1,100 faculty/staff units in the Quarry Development District when added to the 550 units proposed by Stanford in the 2018 General Use Permit application);[57]
- 137 faculty, staff, postdoctoral student and/or other worker units would be located in the East Campus Development District, located at the edge of the District near El Camino Real and Stanford Avenue (which equates to 241 additional housing units added to this district when combined with the 104 graduate student beds identified above);
- 242 faculty, staff, postdoctoral student and/or other worker units would be located in the DAPER and Administrative Development District, located at the edge of the district along El Camino Real; and
- 242 faculty, staff, postdoctoral student and/or other worker units would be located in West Campus Development District located at the edge of the district along Sand Hill Road.

[57] This amount of additional housing in the Quarry District is the same as that assumed for Additional Housing Alternative A, recognizing that the Quarry housing sites are the only sites Stanford has identified for multi-family housing under the proposed 2018 General Use Permit, and that these sites benefit from a close proximity to transit services.



Stanford 2018 General Use Permit . 160531

SOURCE: Stanford LBRE LUEP; ESA

Figure 7.B-1
Development Districts and Assumed Distribution of Academic, Academic Support and Housing under Additional Housing Alternative B

Placement of additional housing in the East Campus Development District would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Further, placement of housing at the edges of the West Campus and DAPER and Administrative Development Districts could require development of lands that are currently used for recreation fields and/or detention basins located in these areas, which could in turn, need to be relocated elsewhere on the campus. Under this circumstance, Stanford would provide replacement stormwater detention facilities with an equivalent detention capacity. Although speculative and not considered in this analysis, Stanford has indicated that the need to relocate these facilities could lead to requests to modify the Arboretum, other Campus Open Space areas or lands outside the Academic Growth Boundary. Any such modifications would be required to comply with CEQA prior to consideration of approval.

Assumed Characteristics of Additional Housing Units

Assumptions about the potential characteristics of the additional on-campus housing under this alternative are informed by (a) the requirement in the Stanford Community Plan (Policy SCP-LU 3) that faculty/staff housing within the Academic Campus lands must be at least 15 units per acre; (b) the configuration and appearance of the EV Graduate Residences; and (c) the rough conceptual site planning Stanford has conducted for the proposed Quarry Road housing in support of the 2018 General Use Permit application.

Based on the Stanford Community Plan, and consistent with its policies promoting compact urban development, it is reasonable to assume that additional faculty/staff and/or other worker housing that would occur under this alternative within the Quarry, West Campus, DAPER and Administrative, and/or East Campus Development Districts would be multi-family housing.

The EV Graduate Residences project and Stanford's internal conceptual site planning for the proposed new housing at Quarry Road indicate that additional graduate student housing and/or multi-family housing buildings that would be developed under this alternative could range from about 50 feet tall to heights reaching approximately 100 to 135 feet.[58,59] Based on planning for the Quarry Road housing sites proposed under the 2018 General Use Permit, densities for the additional multi-family housing under this alternative would range from about 40 to 80 units per acre.[60] The higher range of these height and density estimates would be expected for all new multi-family housing that would occur in the Quarry Development District under this alternative.[61] These heights and densities also are assumed for purposes of analysis in the remaining Development Districts.

58 While heights on both of the Quarry sites to be developed under the proposed 2018 General Use Permit are unknown and might be taller than 50 feet, Stanford assumed for conceptual planning purposes that 550 units could be achieved on these sites with buildings that are about 50 feet tall.

59 The EV Graduate Residences project currently under construction includes four residential buildings that are 116 feet to the top of the roof and 134 feet to the top of the mansard.

60 In its 2018 General Use Permit application, Stanford proposes to construct 550 units on two sites in the Quarry Development District, at a combined density of approximately 40 units/acre (on 13.5 acres).

61 If twice as many units were constructed on the Quarry Development District housing sites, the density would double and it is reasonable to assume that building heights also would double. As a result, if a total of 1,100 housing units (550 housing units proposed under the 2018 General Use Permit and 550 housing additional units under this alternative) were assumed to be placed upon the combined 13.5-acres housing sites in the Quarry Development District, the density would be approximately 80 units per acre, and building heights would be 100 feet or more.

Under this alternative, on-campus housing developed in the DAPER and Administrative, Quarry, West Campus and East Campus Development Districts could exceed 50 feet in height (up to approximately 135 feet) and could be up to 80 units per acre. Under this alternative, construction of additional faculty/staff housing units in the Quarry Development District would necessitate modifications to the El Camino Real Frontage Plan. The Plan establishes a 20-foot setback along El Camino Real, and a 50 feet height limit within 100 feet of El Camino Real. The County and Stanford may determine that high density transit-oriented housing across from the Palo Alto Transit Station is an appropriate land use for this location, such that a reduced setback and increased height limits are appropriate. Construction of the additional faculty/staff units in the DAPER and Administrative Development District under this alternative could also necessitate modifications to the El Camino Frontage Plan. El Camino Real is a high-quality transit corridor. While it may be physically feasible to locate housing farther back from El Camino Real, the County may determine that retention of existing facilities and encouragement of high density housing along the transit corridor justify modifications to the El Camino Frontage Plan's setbacks and height limits.

On-campus Population

Under this alternative, as under the proposed Project, academic and academic support space would expand at a growth rate consistent with Stanford's historic growth rate for such facilities. The projected total/daily population growth (excluding campus residents) would be the same as that which would occur under the proposed 2018 General Use Permit (see Table 5.12-9 in Draft EIR Section 5.12, Population and Housing). However, since this alternative would provide additional on campus housing to accommodate half the net increase in off-campus population that would occur under the proposed Project, the anticipated population that would reside on the Project site under this alternative would be greater than under the proposed Project.

Table 7B-3 summarizes the anticipated population that would reside on the Project site in 2018, and in 2035 under this alternative. This includes the increase in on-campus residential population associated with remaining authorized housing that would be developed on-site by 2020 under the 2000 General Use Permit and the increase in on-campus residential population associated with new housing that would be authorized under the proposed 2018 General Use Permit (together amounting to 6,326), and the increase in on-campus residential population associated with the additional on-campus housing proposed under this alternative (3,125), for a total increase in on-campus residential population of 9,451. The total on-campus residential population in 2035 under this alternative would be 24,789.

TABLE 7B-3
STANFORD POPULATION RESIDING ON PROJECT SITE UNDER ADDITIONAL HOUSING ALTERNATIVE B

Affiliation	Residential Population Within Project Site Boundary in 2018	Residential Population Within Project Site Boundary under Proposed Project in 2035[a]	Additional Change in Residential Population Within Project Site Boundary under Additional Housing Alternative B Compared to Project	Total Residential Population Within Project Site Boundary in 2035	Total Change in Residential Population Within Project Site Boundary 2018 to 2035
Undergraduate Students	6,617	8,317	0	8,317	1,700
Graduate Students	5,205	8,183	105	8,288	3,083
Non Student Spouses	660	894	9	903	243
Children	420	420	0	420	0
Faculty/Staff/Postdoctoral Students[b,c,d]	965	1,515	1,171[e]	2,686	1,721
Other Family Members	1,471	2,335	1,840	4,175	2,704
Total	**15,338**	**21,664**	**3,125**	**24,789**	**9,451**

[a] This includes increases in population associated with remaining authorized housing that would be developed on-site by 2020 under the 2000 General Use Permit, and population associated with new housing that would be authorized under the proposed 2018 General Use Permit.
[b] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[c] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[d] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[e] The number of additional housing units in Table 7B-1 for this category was calculated based on housing demand from increased faculty, staff, and postdoctoral scholars, as well other workers. The actual occupancy of these additional units under this alternative is unknown, but assumed to be potentially occupiable by unspecified proportions of some or all of these groups.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford University Residential and Dining Enterprises (see Appendix ALT-PRD)

Comparative Analysis of Environmental Effects[62]

Visual and Scenic Resources

Impact 7B.1-1: Additional Housing Alternative B would not adversely affect scenic vistas. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and consequently, would have a greater potential to affect scenic vistas than the proposed Project. It is assumed that the additional increment of on-campus housing for faculty, staff, postdoctoral students and/or other workers that would be developed under this alternative (1,171 units) would be located in the Quarry, West Campus, DAPER and Administrative, and/or East Campus Development Districts (see Figure 7.B-1). As under the proposed Project, no new building square footage or housing would be constructed in the

[62] The following analysis assumes that all of the additional housing that would be developed under Additional Housing Alternative B would be built on-campus. Please see a separate discussion of environmental consequences of Stanford providing additional off-campus housing under this alternative that follows this analysis.

Foothills Development District; therefore, the existing scenic views from the Stanford hills would remain unchanged and this alternative would not adversely affect these scenic vistas.

As with the proposed Project, under this alternative, scenic views of the Stanford foothills and Santa Cruz Mountains are already limited by the topography, intervening existing buildings, and landscaping on the campus. As under the proposed Project, depending on the specific location, orientation, mass and height of the additional housing that would occur under this alternative, it would have the potential to block certain views of the foothills from areas immediately adjacent to the new buildings. Given the location of the four development districts in which the additional housing would be developed under this alternative relative to the central campus, the additional housing would not adversely affect scenic vistas of the foothills from the central campus.

Existing views of the East Bay Hills and San Francisco Bay from the central campus are similarly currently restricted due to topography and existing buildings and vegetation. Depending on specific location, orientation, mass and height of the additional housing development that would occur under this alternative, it would further block certain views of the East Bay Hills and San Francisco Bay from the central campus. However, similar to the proposed Project, the potential loss of certain limited views of the East Bay Hills due to individual additional housing projects constructed under this alternative would not significantly not adversely affect scenic vistas from the campus; therefore, similar to the proposed Project, the impact under this alternative would be less than significant.

Sand Hill Road, which borders the West Campus Development District, is recognized as a scenic route in Policy L-9.1 of the City of Palo Alto's general plan: *Comprehensive Plan 2030*. Views of the East Bay Hills and Stanford foothills along this portion of Sand Hill Road are mostly limited to the direct line of sight along the roadway due to the topography and existing vegetation. Although the additional housing development that would occur within the West Campus Development District under Additional Housing Alternative B could potentially remove or alter the landscaping along Sand Hill Road, scenic vistas of the East Bay Hills and Stanford foothills from this road would not be adversely affected and the impact would be less than significant.

Mitigation: None required.

Impact 7B.1-2: Additional Housing Alternative B could damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and consequently, would have a greater potential to result in effects on scenic resources than the proposed Project.

As under the proposed Project, development that would occur under this alternative would not be located adjacent to any state scenic highway. Junipero Serra Boulevard and Page Mill Road are identified as scenic roads by the Santa Clara County General Plan. Most of the Foothills

Development District is subject to a scenic roads zoning overlay (Zoning Ordinance Chapter 3.30) that protects the visual character of scenic roads through special development and sign regulations.

Similar to the proposed Project, any development under this alternative along Junipero Serra Boulevard and Page Mill Road would be subject to the scenic roads overlay (Section 3.30.050). It should be noted that of the four development districts in which the additional housing under this alternative is assumed to be located, only two small areas of one of the development districts (West Campus) borders Junipero Serra Boulevard. Since both of these small areas are designated as Campus Open Space and similar to the proposed Project, no housing (or any other development under this alternative) would be placed on lands with this designation.

As under the proposed Project, damage to scenic resources occurring as a result of potential infrastructure projects constructed in the vicinity of I-280, Junipero Serra Boulevard, or Page Mill Road would be reduced to a less-than-significant level through compliance with the County's scenic roads overlay regulations. Therefore, similar to the proposed Project, this alternative would have a less than significant impact on scenic resources.

Mitigation: None required.

Impact 7B.1-3: Additional Housing Alternative B could degrade the existing visual character or quality of the site and its surroundings. (*Less than Significant*)

Similar to growth proposed by the Project, all academic and academic support and housing development under Additional Housing Alternative B would be located within the Academic Growth Boundary. Although no site-specific projects and locations have been identified for housing development under this alternative, the potential effects on visual character or quality are described below for the four development districts (DAPER and Administrative, Quarry, East Campus, and West Campus) where additional housing is proposed under this alternative. This alternative's effects on visual character in the other development districts would be the same as under the proposed Project.

DAPER and Administrative Development District

Development in the DAPER and Administrative Development District under this alternative includes the additional 242 faculty, staff, postdoctoral students and/or other worker units identified by this alternative, along with up to 200,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands that are located between Stanford Stadium and El Camino Real. Similar to the proposed Project, any new development that would be constructed in the interior portions of the site (i.e., along Campus Drive and Serra Street, which is currently occupied by several short administrative buildings, surface parking lots, and the Stanford Corporation Yard) would not affect the existing visual character of the area.

This alternative could include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the DAPER and Administrative Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. While it may be physically feasible to locate housing farther back from El Camino Real, the County may determine that retention of existing facilities and encouragement of high density housing along the transit corridor justify modifications to the plan's setbacks and height limits.

Placement of additional housing in the vicinity of El Camino Real could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. As under the proposed Project, any development on the existing athletic fields or the open area known as Masters Grove would degrade the relatively open quality of this area, and would be especially noticeable from off-site public vantage points if buildings are constructed in the fields adjacent to or nearby El Camino Real. Any existing fields within the DAPER and Administrative Development District that may be relocated elsewhere on campus for recreation and/or detention purposes would be of a similar type and scale as those that currently exist, and would not be considered features that would degrade visual character.

While no site-specific housing locations have been identified, each individual building or project that would be developed in this district pursuant to the proposed 2018 General Use Permit would require submittal of an application to the County at the time proposed to determine if the project would require review under the County's ASA process. The ASA application includes submittal of various types of information that would assist the County in evaluating whether specific housing development projects proposed under this alternative would affect the visual character and quality of the site and its surroundings. In the past, Stanford has submitted visual simulations of some proposed projects that could potentially be seen from public roads outside the General Use Permit boundary. The County also may require simulations for buildings constructed through the ASA or other approval processes.

Changes to the existing visual character or quality of Stanford lands in the DAPER and Administrative District under this alternative would occur in specific locations as new buildings are constructed during the lifetime of the Project. Visually, the district would become denser over the lifetime of the Project as new buildings are constructed in proximity to existing buildings. Portions of the DAPER and Administrative District that are devoid of existing buildings would undergo noticeable visual transformation if additional housing is constructed in these areas. In addition, this district currently does not include housing for students, faculty, staff, or other workers. The significance and potential for such development to degrade the visual character of the Project site is dependent on a number of factors, including the design, location, height, massing, and landscaping surrounding new buildings. Proposed development that would have the potential to affect visual character and quality under this alternative would be subject to review by the County through the ASA process described above. Prior to submittal of an ASA application, new housing projects would be designed in accordance with County and Stanford guidance and policy documents that would limit adverse aesthetic effects of such projects. Although changes in the appearance of lands within the DAPER and Administrative District would occur over the duration of the Project, compliance with the County's ASA or other

approval processes would not result in the degradation of the existing visual character or quality of the Project site. Thus, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

Quarry Development District

Development in the Quarry Development District under this alternative includes 1,100 new housing units (550 more faculty, staff, postdoctoral student and/or other worker units than under the proposed Project) and 200,000 square feet of academic and academic support space (same as the proposed Project). Because the Quarry Development District currently consists primarily of a construction staging yard and surface parking lots, any new development, whether proposed by the Project or Additional Housing Alternative B, would alter the visual character of this area. Additional housing proposed under this alternative would likely result in taller buildings and reduced open areas compared to the Project due to space limitations in this district. Stanford anticipates that the residential density in the Quarry District under this alternative would be approximately 80 units per acre and building heights could be up to 135 feet tall.

This alternative is assumed to include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the Quarry Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. The County and Stanford may determine that high density transit-oriented housing across from the Palo Alto Transit Station is an appropriate land use for this location, such that a reduced setback and increased height limits are appropriate. The development of additional housing in this district would be noticeable compared to that proposed by the Project, even considering that the urban context of the area includes multi-story buildings such as the Hoover Pavilion and the Lucile Packard Children's Hospital Stanford.

As discussed above under DAPER and Administrative District, above, proposed development that would have the potential to affect visual character and quality in the Quarry Development District would be subject to review by the County through the ASA process. Prior to submittal of an ASA application, new housing projects would be designed in accordance with County and Stanford guidance and policy documents that would limit adverse aesthetic effects of such projects. Although changes in the appearance of lands within the Quarry Development District would occur over the duration of the Project, compliance with the County's ASA or other approval processes would not result in the degradation of the existing visual character or quality of the Project site. Thus, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

East Campus Development District

Development in the East Campus Development District under this alternative includes 1,841 new housing units (241 more units than the proposed Project, including an additional 137 faculty, staff, postdoctoral student and/or other worker units as well as 104 graduate student units) and 20,000 square feet of academic and academic support space (same as the proposed Project). Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. Stanford has indicated that placement of additional housing in

this district would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Additional housing proposed in this development district would not change the existing visual character of this district as this district consists almost entirely of graduate and undergraduate housing, of varying building types and sizes. As shown on Figure 5.1-3 in Section 5.1 in the Draft EIR, views of the interior portion of the East Campus Development District, and thus possible building sites, would largely be hidden from public vantage points adjacent to the district. As under the proposed Project, new buildings would likely not be constructed along Stanford Avenue or El Camino Real, as those areas were recently developed with new faculty and staff housing. Similar to the proposed Project, development in the East Campus Development District would be designed in accordance with County and Stanford guidance and policy documents, and would be subject to review by the County through the ASA process. Therefore, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

West Campus Development District

Development in the West Campus Development District under this alternative includes the additional 242 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with 35,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands currently occupied by the Palo Alto Stock Farm Stable (Red Barn), and another narrow strip of land along Campus Drive near its intersection with Junipero Serra Boulevard. New housing proposed under this alternative would represent a noticeable increase in development intensity compared to the relatively small amount of academic and academic support space proposed for this district by the Project. Most of the West Campus Development District is currently devoid of building or structures, including along Sand Hill Road. Under this alternative, any new housing constructed in areas near Sand Hill Road could be visible from off-campus locations, depending on a number of factors related to specific development proposals, such as building placement and height, and screening provided by existing and/or proposed landscaping along Sand Hill Road. As noted above under Impact 7A.1-1, Sand Hill Road is recognized as a scenic route by the City of Palo Alto. Removal or alteration of the existing vegetation could degrade the existing visual quality of this portion of Sand Hill Road. As with the DAPER and Administrative Development District, placement of housing along Sand Hill Road could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. Any existing fields within the West Campus Development District that may be relocated elsewhere on campus for recreation and/or detention purposes would be of a similar type and scale as those that currently exist, and would not be considered features that would degrade visual character.

Other areas within the West Campus Development are currently occupied by the Central Energy Facility, the O'Donohue Family Stanford Educational Farm, the West Campus Tennis Courts, and a surface parking lot south of Searsville Road. Regardless of where new housing would be placed in the West Campus Development District under this alternative, the visual character of this area would change from low-intensity, recreation-focused to include multi-unit residential housing, that would be potentially be visible from off-campus locations. Similar to the proposed Project,

development in the West Campus Development District would be designed in accordance with County and Stanford guidance and policy documents, and would be subject to review by the County through the ASA process. Therefore, similar to the proposed Project, the impacts on existing visual character or quality in the district under this alternative would be less than significant.

Mitigation: None required.

Impact 7B.1-4: Additional Housing Alternative B could create a new source of substantial light or glare that would adversely affect nighttime views in the area. (*Significant*)

As under the proposed Project, new housing development proposed under Additional Housing Alternative B could increase ambient light levels due to light dispersion from the new buildings which may result in spillover lighting within the Project site or in adjacent neighborhoods, and could adversely affect nighttime views in the vicinity of the Project site. Because proposed housing development under this could be located on the periphery of the campus in the Quarry, West Campus, DAPER, and/or East Campus Development Districts, spillover lighting from new housing may increase in off-site areas of the City of Palo Alto (and to a lesser degree in the City of Menlo Park) that border these development districts. Increased ambient light levels under this alternative compared to the proposed Project would likely be most noticeable in the West Campus and DAPER Development Districts, where no housing is proposed for those districts under the Project. Construction of additional housing in the Quarry Development District under this alternative would necessitate modifications to the *Plan for the El Camino Real Frontage* such that buildings would be located closer to El Camino Real and also would be taller, potentially resulting in increased ambient light levels compared to the Project. Construction of additional housing units in the DAPER and Administrative Development District could also necessitate modifications to the plan that would reduce building setback and height restrictions.

As under the proposed Project, Stanford guidelines and policies that address exterior lighting, lighting of paths and pedestrian areas, vehicular and roadway lighting, landscape and entryway lighting, accent lights, and building-mounted lights would be applicable to new housing proposed under this alternative. The County also reviews development proposals through the ASA or other approval processes. In order to assure that new lighting constructed under this alternative would not adversely affect nighttime view in the area Implementation of Mitigation Measure 7B.1-4, which is the same as that identified for the proposed Project, would reduce the impact to a less than significant level. As with the proposed Project, by employing appropriate design standards, including those described in the ASA Guidelines, and minimizing the quantity of reflective material used in new construction, light and glare impacts related to lighting under this alternative would be reduced to less-than-significant levels.

Mitigation Measure 7B.1-4: Stanford shall submit a lighting plan for approval by the County Planning Office, as part of an ASA review, for each development project that would include exterior light sources. The plan shall show the extent of illumination that would be projected from proposed outdoor lighting. State-of-the-art luminaries shall be

used where necessary, with high beam efficiency, sharp cut-off, and glare and spill control. Upward glow shall not be allowed in residential or academic uses.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7B.1-5: Additional Housing Alternative B, in combination with past, present, and future projects could potentially contribute to cumulative visual and scenic resource impacts. (*Significant*)

The geographic scope of potential cumulative impacts to visual and scenic resources encompasses the Stanford lands within the General Use Permit boundary and areas outside the boundary from which viewers could see the Project in conjunction with views of other projects in the cumulative scenario.

As with the proposed Project, housing development under Additional Housing Alternative B would likely not be visible from Portola Valley, Los Altos Hills, Menlo Park, or unincorporated portions of San Mateo County. Therefore, no cumulative visual and scenic resource impacts would result from this alternative combining with impacts of past, present, or reasonably foreseeable future projects within these jurisdictions.

Any potential future Stanford projects on Stanford-owned lands in Palo Alto with views of housing development constructed under this alternative would be similarly designed in accordance with Stanford guidance and policy documents that would limit potentially adverse visual characteristics of such projects.

Past, present, and reasonably foreseeable future projects within those areas of Palo Alto not owned by Stanford have the potential to create new visual impacts that could be affected by the Project. However, these areas are either built-out as residential neighborhoods; institutional uses that are unlikely to be altered; or border areas of Stanford along El Camino Real that are designated as Campus Open Space, and thus would not be developed under this alternative.

Therefore, the less-than-significant impacts of Additional Housing Alternative B regarding scenic vistas, or visual character would not combine with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto with views of housing development under this alternative and result in a cumulative impact for these environmental resources. Cumulative light and glare impacts would be significant pre-mitigation, but implementation of Mitigation Measure 7B.1-4 would reduce this alternative's contribution to a less than cumulatively considerable level. Projects constructed in Palo Alto would be subject to Section 18.23.030 of the City of Palo Alto Municipal Code, which includes measures to reduce off-site light spillage. Post-mitigation, the cumulative impact regarding light and glare would not be significant.

Mitigation: Implement Mitigation Measure 7B.1-4.

Significance after Mitigation: Less than Significant.

Air Quality[63]

Construction Impacts

Impact 7B.2-1: Additional Housing Alternative B construction would not result in emissions of NOx, PM, and ROGs that would exceed BAAQMD significance thresholds. (*Less than Significant*)

Construction of individual projects developed under Additional Housing Alternative B would generate construction emissions from the same variety of sources as the proposed 2018 General Use Permit: off-road construction equipment; and on-road worker, vendor, and hauling vehicles. Construction-related emissions from Additional Housing Alternative B were calculated using the same methodology as discussed in the Draft EIR for the proposed Project.

However, the average construction scenario for Additional Housing Alternative B assumed an annual average of approximately 292,500 square feet of new building construction (an increase of 67,000 square feet over the proposed Project), approximately 51,500 square feet of demolition (an increase of 1,200 square feet over the proposed Project), and excavation of approximately 103,490 of cubic yards of soil (an increase of 41,430 cubic yards over the proposed Project).

Table 7B.2-1 presents a summary of the average daily construction-related emissions that would result under Additional Housing Alternative B under the average construction scenario. As shown in Table 7A.2-1, under the average construction scenario, emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under this alternative would be higher than the proposed Project, however, as with the proposed Project, emissions would be below the respective thresholds for these pollutants.

Additional Housing Alternative B would have more total construction than the proposed Project. However, peak construction under both the proposed Project and Additional Housing Alternative A would be less than the scope and size of the Escondido Village project authorized under the 2000 General Use Permit, which served as the basis for the peak construction scenario analyzed in this EIR.[64] The largest new housing site under Additional Housing Alternative B would be the site at Quarry Road, which is assumed to accommodate a total of 1,100 new faculty/staff units at about 1,100,000 square feet of building development. The Escondido Village project consists of about 3 million square feet of building development including structured parking and housing replacement. Thus, even if the largest new housing complex under Additional Housing Alternative B were constructed over a duration similar to the Escondido Village project, the peak square footage would remain lower than the peak construction scenario analyzed in the Draft EIR. Consequently, as a conservative approach for Additional Housing Alternative B, and similar to the

63 The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives air quality analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-AQT included in this document.

64 As discussed in the Draft EIR, the Escondido Village project consists of 1,655,000 square feet of building development, demolition of 29 buildings, and net increase of 2,020 beds and supporting amenities.

conservative approach taken for the proposed Project, the construction emissions for the peak construction year for this alternative are assumed to be consistent with that of the Escondido Village project. As a result, under the peak construction scenario for Additional Housing Alternative B, emissions of ROG, NOx, PM_{10} and $PM_{2.5}$ under this alternative would be similar to the proposed Project, and would be below the respective thresholds for these pollutants.

TABLE 7B.2-1
ADDITIONAL HOUSING ALTERNATIVE B AVERAGE DAILY CONSTRUCTION EMISSIONS

Pollutant	Average Daily Emissions (pounds/day)			
	ROG	NOx	Exhaust PM_{10}[a]	Exhaust $PM_{2.5}$[a]
	Average Construction Scenario			
2018 General Use Permit Emissions	14.9	22.0	2.8	1.3
Additional Emissions under Additional Housing Alternative B	4.4	10.2	0.24	0.15
Total with Additional Housing Alternative B Emissions	19.3	32.3	3.1	1.4
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No

NOTES:
[a] Exhaust PM for the Project average and peak construction scenarios includes tire wear and brake wear PM for on-road vehicles. The BAAQMD Thresholds do not include these sources so the comparison is conservative.

SOURCE: Ramboll, 2018 (see Appendix ALT-AQT)

Therefore, as under the proposed Project, the construction-related criteria air pollutant emissions under Additional Housing Alternative B would be less than significant.

Mitigation: None required.

Impact 7B.2-2: Additional Housing Alternative B construction would generate fugitive dust that could result in a localized increase in particulate matter. (*Significant)*

Similar to the proposed 2018 General Use Permit, demolition, excavation, grading, and other construction activities associated with individual projects developed under Additional Housing Alternative B may cause wind-blown dust that could contribute PM into the local atmosphere. Since that there would be an increase in total construction under this alternative compared to the proposed Project, there would be a corresponding increase in dust-generating activities under this alternative as well. As under the proposed Project, construction-related dust emissions under this alternative would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, dust generated from construction activities may result in significant adverse impacts on a temporary and intermittent basis during the construction period.

The BAAQMD's recommended approach to analysis of construction-related particulate impacts (other than exhaust PM) is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. The BAAQMD considers construction-related fugitive dust impacts of projects to be less than significant if a suite of recommended dust-control measures is implemented. Therefore, implementation of the BAAQMD-identified Best Management Practices for control of fugitive dust, the same mitigation as identified for the proposed Project, would reduce construction effects from fugitive dust generation under this alternative to a less than significant level.

Mitigation Measure 7B.2-2: *Best Management Practices for Controlling Particulate Emissions.* Stanford shall require all construction contractors to implement the following measures:

- All exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day;
- All haul trucks transporting soil, sand or other loose material off-site shall be covered;
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweepers is prohibited;
- All vehicle speeds on unpaved roads shall be limited to 15 mph;
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. Clear signage shall be provided for construction workers at all access points;
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible emissions evaluator; and
- Post a publicly visible sign with the telephone number and person to be contacted regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Less than Significant.

Impact 7B.2-3: Additional Housing Alternative B construction would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

Site preparation activities, such as demolition, excavation, grading, foundation construction, and other ground-disturbing construction activities associated with individual projects developed under Additional Housing Alternative B would affect localized air quality. Emissions from construction equipment during these site preparation activities would include directly emitted particulate matter ($PM_{2.5}$ and PM_{10}) and TACs such as diesel particulate matter (DPM). The generation of these emissions during construction could expose sensitive receptors to substantial pollutant concentrations of TACs, resulting in a localized health risk. Given that there would be an increase in total construction activities, and an increase in total on-campus sensitive receptors, under this alternative compared to the proposed 2018 General Use Permit, this alternative would have a greater potential to expose sensitive receptors to substantial pollutant concentrations or health risks than the proposed Project.

Similar to the proposed Project, it is not possible to conduct a health risk assessment (HRA) for construction related to each individual project that would occur under Additional Housing Alternative B. Accordingly, the same screening tool that was developed for the proposed 2018 General Use Permit to ensure future construction activities would not result in emissions of toxic air contaminants exceeding BAAQMD health risk significance thresholds would similarly be applicable to Additional Housing Alternative B.[65] The screening tool provides minimum distances to site new projects depending on size and proximity to sensitive receptors such as children.

Table 7B.2-2 presents the screening distances developed to determine the circumstances in terms of construction project size and distance from receptors under which a significant construction-related health risk may occur. As under the proposed Project, although the precise location of future individual projects under this alternative is not known, because construction projects could occur closer to sensitive land uses than the screening distances shown in Table 7B.2-2, this alternative could result in a significant health risk impact.

Implementation of **Mitigation Measure 7B.2-3(a)**, the same mitigation identified for the proposed Project, would require Stanford to conduct a health risk screening of individual projects developed under the proposed 2018 General Use Permit. If applicable, **Mitigation Measure 7B.2-3(b)**, also the same as identified for the proposed Project, would require a project-specific health risk analysis to demonstrate that the project construction activities would not result in a significant acute, chronic non-cancer or cancer-related health risk to specific sensitive receptors. Implementation of Mitigation Measures 7B.2-3(a)-(b) would ensure potential exposure of sensitive receptors to substantial pollutant concentrations or health risk from construction activities under the Additional Housing Alternative B would be less than significant.

[65] The screening tool is based on the EV Graduate Residences project, which reflects the largest quantity of earth moving and the largest amount of above and below ground construction that Stanford has undertaken for a single project under the 2000 General Use Permit. The EV Graduate Residences construction project is likely to be larger than any individual project that would be constructed under either the proposed 2018 General Use Permit, or this alternative.

TABLE 7B.2-2
CONSTRUCTION HEALTH RISK SCREENING DISTANCES

Maximum Project Size	Minimum Distance (feet) to Nearest Receptor Type[a]		
	Childcare Facility	Child Resident	Adult Resident
3.27 million square feet with up to 900,000 CY of debris/soil export	460	165	33
540,000 square feet with up to 150,000 CY of debris/soil export	165	33	33
180,000 square feet with up to 50,000 CY of debris/soil export	100	33	33
45,000 square feet with up to 12,500 CY of debris/soil export	33	33	33

NOTES:

[a] The screening tool stipulates that a 33-foot buffer must exist around the construction site fence line where no sensitive receptor resides. If a construction site is within the 33-foot buffer from sensitive receptors, or directly adjacent to a childcare facility, the project must both comply with the screening limits presented above and restrict diesel-powered operations to when children are not present in order to screen out of conducting a health risk analysis.

SOURCE: Ramboll Environ, 2017 (see Draft EIR Appendix AQT)

Mitigation Measure 7B.2-3(a): *Health Risk Screening for Construction Projects.* Prior to approval of an individual project, Stanford shall conduct a project-specific health risk screening using the screening distances presented in Table 5.2-8 and submit it to the County Planning Office for peer review and approval. If the individual project is located further from sensitive receptors than the minimum distance identified in Table 5.2-8, then no further construction health risk assessment or additional mitigation is required. If the construction project is closer than the specified minimum distance, then a project-specific Health Risk Assessment shall be prepared, as outlined in Mitigation Measure 7B.2-3(b).

Mitigation Measure 7B.2-3(b): *Project-Specific Health Risk Analysis.* If the screening criteria in Table 5.2-8 are not met, Stanford shall prepare and submit to the County Planning Office for peer review and approval a project-specific health risk analysis demonstrating that project construction activities will not result in a significant acute, chronic non-cancer or cancer-related health risk to sensitive receptors. As a performance standard, any subsequent project-specific health risk analysis must demonstrate an excess cancer risk level of 10-in-1 million or less, a non-cancer (i.e., chronic or acute) hazard index of 1.0 or less, and an incremental increase an annual average $PM_{2.5}$ concentration of no more than 0.3 microgram per cubic meter.

Significance after Mitigation: Less than Significant.

Operational Impacts

Impact 7B.2-4: Additional Housing Alternative B operational emissions from new development would not result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. (*Less than Significant)*

Similar to the proposed Project, Additional Housing Alternative B would generate operational emissions from a variety of sources, including new vehicle trips, operation of boilers, maintenance operation of diesel emergency generators; new laboratories; fueling stations; and off-road sources from Stanford maintenance equipment and construction activities. Additional Housing Alternative B would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in criteria air pollutants compared to the proposed Project.

An air quality analysis of Additional Housing Alternative B is included in Appendix ALT-AQT, and includes a detailed inventory of operational emissions of this alternative. The operational criteria air pollutant inventory analysis for Additional Housing Alternative B used the same methodology that was developed for the proposed Project for all sources except entrained road dust from vehicle trips. These analytical methods include use of the same USEPA emission factors to estimate emissions from emergency generators and boilers, and the same EMFAC2014 emission factors from CARB to estimate emissions for vehicle trips. For entrained road dust, localized Santa Clara County-specific emission factors were applied using Method 7.9 of the California Air Resources Board and applied to the 2018 baseline, buildout of the proposed Project, and the additional housing alternative scenarios. Consequently, baseline and proposed Project values for PM_{10} and $PM_{2.5}$ reported below are slightly different than what was reported in the Draft EIR.[66]

Table 7B.2-3, below, presents the net change in maximum annual and average daily criteria air pollutant emissions in the study area between the 2018 baseline and 2035 with buildout of Additional Housing Alternative B. Similar to the proposed Project, emissions of ROG and NOx would decrease by 2035 compared to the 2018 environmental baseline, largely as a result of improvements to the motor vehicle fleet due to more stringent emission standards; as well as the proposed electrification of Stanford's Marguerite bus fleet and 70 percent of its Lands, Buildings and Real Estate (LBRE) and Bonair vehicle fleets by 2035. Emissions of PM_{10} and $PM_{2.5}$ under this alternative are predicted to increase due primarily to entrained dust emissions that would result from increased VMT.

As shown in Table 7B.2-3, emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ for Additional Housing Alternative B would all be below BAAQMD thresholds. Therefore, similar to the proposed Project, criteria air pollutants under Additional Housing Alternative B would result in a less than

[66] The operational mobile emissions presented in the Draft EIR Appendix AQT included vehicle emissions from the EMFAC2014 model, which contains PM_{10} and $PM2.5$ from exhaust, brakewear, and tirewear, but not roadway dust. BAAQMD subsequently clarified that roadway dust should be included in the emissions to compare to the operational thresholds. The inclusion of roadway dust in operational mobile emissions did not change any significance conclusions in the Draft EIR for the proposed Project.

significant impact. Table 7B.2-3 also compares emissions under Additional Housing Alternative B to those generated by the proposed 2018 General Use Permit, with emissions ranging from 4 to 10 percent greater under Additional Housing Alternative B, depending on pollutant.

TABLE 7B.2-3
NET CHANGE IN MAXIMUM ANNUAL AND AVERAGE DAILY OPERATIONAL CRITERIA AIR POLLUTANT EMISSIONS UNDER ADDITIONAL HOUSING ALTERNATIVE B

Pollutant:	ROG	NOx	PM_{10}	$PM_{2.5}$[a]
Maximum Annual Emissions (Tons Per Year)				
Total 2018 Baseline Emissions [c]	47	82	33[c]	10[c]
Total Emissions in 2035 with Buildout of Additional Housing Alternative B	43	51	46[c]	13
Net Change in Emissions of Additional Housing Alternative B Compared to Baseline [b]	-4	-31	+13	+3
Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Total Emissions in 2035 with Buildout of proposed 2018 General Use Permit [c]	40	49	42[c]	12[c]
Increase in Emissions of Additional Housing Alternative B over proposed 2018 General Use Permit [b]	+3	+2	+4	+1
Average Daily Emissions (Pounds Per Day)				
Total 2018 Baseline Emissions [c]	256	447	181[c]	55[c]
Total Emissions in 2035 with Buildout of Additional Housing Alternative B	234	280	250	72
Net Change in Emissions of Additional Housing Alternative B Compared to Baseline [b]	-22	-167	+70	+17
Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Total Emissions in 2035 with Buildout of proposed 2018 General Use Permit [c]	220	270	232[c]	68[c]
Increase in Emissions of Additional Housing Alternative B over proposed 2018 General Use Permit [b]	+13	+10	+19	+4

NOTES:
[a] $PM_{2.5}$ from non-mobile sources conservatively assumed to be equivalent to PM_{10} value.
[b] Emission totals may not appear to total due to rounding.
[c] Baseline values for PM_{10} and $PM_{2.5}$ are different than those reported in the Draft EIR as they now reflect more recently available emission factors published in 2017.

SOURCE: Ramboll, 2018 (see Appendix ALT-AQT)

Mitigation: None required.

Impact 7B.2-5: Additional Housing Alternative B operation of development would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant*)

Similar to the proposed 2018 General Use Permit, Additional Housing Alternative B would result in development that would generate operational emissions of TACs and localized contributions to $PM_{2.5}$ concentrations from a variety of sources, including emissions from passenger vehicles and delivery vehicles, diesel generators, laboratory fume hood stacks and, to a lesser extent, natural gas combustion. Given that there would be an increase on-campus sensitive receptors, under this alternative compared to the proposed 2018 General Use Permit, this alternative would have a greater potential to expose sensitive receptors to substantial pollutant concentrations or health risks than the proposed Project.

Mobile Source Air Toxics

Mobile source air toxics are emitted from vehicles and are compounds that are known or suspected to cause cancer or other serious health and environmental effects. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter (DPM). TAC emissions from mobile sources would be reduced under this alternative compared to 2018 environmental baseline conditions, resulting in a reduction of health risks from mobile sources.

As discussed in Impact 7B.2-4, Additional Housing Alternative B would result in a marginal increase in $PM_{2.5}$ emissions, and incrementally more than the proposed Project. This increase would be a basin-wide increase primarily resulting from exhaust emissions resulting from increased VMT. Using El Camino Real as a proxy and the BAAQMD's screening calculator for roadway emissions, the predicted increase in vehicles along El Camino Real would result in an increased $PM_{2.5}$ concentration of 0.03 μg/m3 at 100 feet (or 0.01 μg/m3 more than the proposed Project). This increase is below BAAQMD's significance threshold of 0.3 μg/m3 for project-level contributions to localized concentrations of $PM_{2.5}$. Consequently, similar to the proposed Project, Additional Housing Alternative B is considered to have a less-than-significant impact with regard to health risks from mobile sources.

Diesel Emergency Back-up Generators Air Toxics

Similar to the proposed Project, new diesel emergency back-up generators would be required for some buildings constructed under Additional Housing Alternative B as a safety requirement. Any new diesel generators larger than 50 horsepower would require a permit from the BAAQMD and must comply with the Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines. As a practical matter, the BAAQMD will not issue a permit for a new generator that results in an operational cancer risk greater than 10 in one million. Accordingly, and similar to the proposed Project, health risk impacts from new emergency generators would be considered less than significant.

Laboratory Air Toxics

Because Additional Housing Alternative B would not change the allocation for development of academic space compared to the proposed Project, there would be no increase in on-campus

laboratory development, or chemical usage associated with those uses, under this alternative compared to the proposed Project, although as noted above, there would be a larger on-campus residential population.

TAC emissions dispersion predicted the incremental increase in cancer risk associated with the Project was estimated to be 4.5 in one million, which is well below the BAAQMD significance threshold of 10 in a million. The risk under Additional Housing Alternative B would be the same as for the proposed Project since there would be no additional laboratories under this alternative. As under the proposed Project, under this alternative acute and chronic hazard indices (HIs) would increase by 0.03 and 0.01, respectively, which are also below the BAAQMD significance threshold of 1.0. Therefore, as under the proposed Project, impacts on health risks from laboratory TAC emissions under this alternative would similarly be less than significant.

Similar to the proposed Project, limitations of the health risk assessment prepared at this stage may not account for development under Additional Housing Alternative B that may involve substantial amounts of laboratory space and fume hoods. BAAQMD's Rule 2-1 exempts teaching laboratories used exclusively for classroom experimentation and/or demonstration. Given the potential for future development under Additional Housing Alternative B to include both teaching laboratories as well as research laboratories, the potential exists that the requirements of Rule 2-1 may not apply. Consequently, similar to the proposed Project, the potential health risks from laboratory TAC emissions under Additional Housing Alternative B is considered significant. Accordingly, **Mitigation Measure 7B.2-5**, the same mitigation proposed for the Project, is identified to ensure that substantial amounts of laboratory space under this alternative would not result in a significant health risk.

Natural Gas Combustion

Natural gas combustion results in emissions of benzene, formaldehyde, and toluene. Under Additional Housing Alternative B, there would be an incremental increase in these TAC emissions due to an increase in natural gas combustion associated with residential and non-residential growth. However, these increases under this alternative compared to the 2018 baseline would be marginal [net change of 0.32 lb/yr of benzene (an incremental increase of 0.03 lb/yr over the proposed Project), 11.2 lb/yr of formaldehyde (an incremental increase of 1.0 lb/yr over the proposed Project), and 0.44 lb/yr of toluene (an incremental increase of 0.048 lb/yr over the proposed Project], and any new natural gas boilers would need to be permitted and comply with any applicable BAAQMD standards (Appendix ALT-AQT). Therefore, health risk impacts from natural gas combustion resulting from development under Additional Housing Alternative B would be similar to those under the proposed Project, and similarly, would be less than significant.

> **Mitigation Measure 7B.2-5:** *Laboratory Fume Hood Emission Control*. For any individual project that contains more than 25,000 square feet of emissions-generating laboratory space within a building and 50 fume hoods, Stanford shall conduct a health risk screening analysis and obtain a permit from the BAAQMD for the proposed individual project; this permit may be required either prior to or as a condition of approval of the proposed individual project. In accordance with BAAQMD Rules 2-1 and 2-5, new sources of emissions must implement Best Available Control Technology for

Toxics (T-BACT) if individual source risks exceed 1.0 in a million for cancer and/or chronic hazard index is greater than 0.20. Additionally, a permit will be denied if project cancer risk exceeds 10.0 in a million or if the chronic or acute hazard index exceeds 1.0. Compliance with BAAQMD rules will ensure that new laboratory operations will not result in a significant health risk impact.

Significance after Mitigation: Less than Significant.

Impact 7B.2-6: Additional Housing Alternative B operations would not result in local concentrations of carbon monoxide that would exceed State and federal standards. (*Less than Significant*)

Development under Additional Housing Alternative B would generate additional vehicle trips (over baseline and Project conditions) and associated emissions of CO along area roadways. BAAQMD provides a screening methodology based on peak hourly traffic volumes to evaluate potential impacts of CO emissions from mobile sources (BAAQMD *CEQA Air Quality Guidelines*, Updated May 2017). This preliminary screening procedure provides a conservative indication of whether the proposed Project would result in the generation of CO concentrations that would substantially contribute to an exceedance of the thresholds of significance. If all of the screening criteria are met, the proposed Project would result in a less-than-significant impact to air quality with respect to concentrations of local CO.

The screening methodology focuses on intersections with vehicle traffic exceeding 44,000 vehicles per hour after Project buildout (or 24,000 vehicles per hour in locations with limited vertical or horizontal air mixing) that could violate or contribute to a violation of ambient air quality standards for CO. Based on the study intersection analysed in Section 7.15, Transportation and Traffic, indicates that the greatest total intersection volumes would occur at the intersection of Page Mill Road with El Camino Real during the p.m. peak hour with 8,656 vehicles (an increase of less than 100 vehicles over the proposed Project). With buildout of Additional Housing Alternative B in 2035, all study intersection volumes would be below the 24,000 vehicles per hour screening threshold. Thus, similar to the proposed Project, Additional Housing Alternative B would not contribute to a violation of CO air quality standards.

Mitigation: None required.

Impact 7B.2-7: Additional Housing Alternative B operation of development would not create objectionable odors that would affect a substantial number of people. (*Less than Significant*)

The BAAQMD CEQA Guidelines identifies wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations and metal smelters as odor sources of particular concern, recommends buffer zones of one to two miles around them to avoid potential odor conflicts, and requires a BAAQMD permit. There are no facilities of these types in the vicinity of the Project site,

similar to the proposed Project, none are proposed or allowed under Additional Housing Alternative B. As under the proposed Project, Additional Housing Alternative B would provide for the development of new housing, academic, and academic support uses, and would not result in the development or operations of odor sources of concern. Consequently, similar to the proposed Project the potential for Additional Housing Alternative B to result in objectionable odors is less than significant.

Mitigation: None required.

Impact 7B.2-8: Additional Housing Alternative B operation of development could conflict with or obstruct implementation of the applicable air quality plan. (*Potentially Significant*)

In April 2017 the BAAQMD adopted the *2017 Clean Air Plan* (BAAQMD, 2017d). The 2017 Clean Air Plan's primary goals are to protect public health and protect the climate, and it contains 85 measures some of which address reduction of GHGs. The 2017 BAAQMD CEQA Guidelines identify a methodology to assess consistency with the Clean Air Plan be used to evaluate plan-level projects. Specifically, the 2017 BAAQMD CEQA Guidelines recommend the consideration of three questions:

- Does the project support the primary goals of the air quality plan?;
- Does the project include applicable control measures from the air quality plan?; and
- Does the project disrupt or hinder implementation of any Clean Air Plan control measures?

With regard to the first question, the BAAQMD CEQA Guidelines provide a basis for assessing support of the primary goals. The primary goals of the 2017 Bay Area Clean Air Plan are to:

- Attain all state and national air quality standards;
- Eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and
- Reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.

Any project (i.e., project or plan) that would not support these goals would not be considered consistent with the 2017 Clean Air Plan. If approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the 2017 Clean Air Plan. Based on the discussion presented in Impacts 7B.2-1 through 7B.2-7 above, development under Additional Housing Alternative B would have a less-than-significant impact with regard to air quality with implementation of identified mitigation measures, similar to the proposed Project. As under the proposed Project, if Additional Housing Alternative B is approved and the mitigation measures identified in this EIR are imposed through the adoption of a Mitigation Monitoring Plan (pursuant to State CEQA

Guidelines section 15097), Additional Housing Alternative B would be considered consistent with the 2017 Clean Air Plan.

The second question recommended in the 2017 BAAQMD CEQA Guidelines for evaluating consistency with the 2017 Clean Air Plan is whether the project includes applicable control measures from the air quality plan. The 2017 Clean Air Plan contains transportation control measures and measures related energy, green building, waste management, water control and control of short-lived GHGs. The measures applicable to criteria air pollutants, TACs, or greenhouse gases generated under Additional Housing Alternative B are the same as those identified for the proposed 2018 General Use Permit in **Table 5.2-11** of the Draft EIR. As discussed in Chapter 3, Project Description, in the Draft EIR, Stanford currently implements a number of programs and practices to promote sustainability at the campus, including Transportation Demand Management, energy supply and efficiency, water supply and conservation, and solid waste reduction and recycling. As with the proposed Project, under Additional Housing Alternative B, Stanford would commit to continue to implement, and update as needed, these sustainability programs and practices.

These mechanisms would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. As with the proposed Project, there are some control measures with which Additional Housing Alternative B, as proposed, may not be consistent, this impact is considered significant. Where an implementation mechanism does not currently exist or is not identified in Additional Housing Alternative B, mitigation measures identified in the EIR are identified to ensure consistency of Additional Housing Alternative B with the 2017 Clean Air Plan. With elements identified as part of Additional Housing Alternative B, and implementation of mitigation measures identified in this EIR, Additional Housing Alternative B would be consistent with applicable control measures from the 2017 Clean Air Plan, similar to the proposed Project.

The final basis for evaluation of consistency with the 2017 Clean Air Plan is whether Additional Housing Alternative B would disrupt or hinder implementation of any 2017 Clean Air Plan control measure. With elements identified as part of the proposed 2018 General Use Permit, along with implementation of mitigation measures identified in this EIR, Additional Housing Alternative B would not adversely affect implementation of any 2017 Clean Air Plan control measure. This is the same finding as under the proposed Project.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7B.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 7B.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 7B.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 7B.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7B.2-9: Additional Housing Alternative B would not result in emissions of NOx, PM, or ROGs that are cumulatively considerable. (*Less than Significant*)

BAAQMD developed thresholds of significance for both construction and operation with consideration of individual project emission levels that would be cumulatively considerable. If a project exceeds the identified project significance levels, then its emissions would be cumulatively considerable. Table 7B.2-1 shows that construction emissions under Additional Housing Alternative B would not exceed emission thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Table 7B.2-3 shows that operational emissions under Additional Housing Alternative B would not exceed emission thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Therefore, as under the proposed Project, emissions of ROG, NOx, PM_{10} or $PM_{2.5}$ from Additional Housing Alternative B would not result in a cumulatively considerable contribution to a cumulative air quality impact.

Mitigation: None required.

Impact 7B.2-10: Additional Housing Alternative B could considerably contribute to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks. (*Significant)*

As discussed in Impact 7B.2-3, because construction projects developed under Additional Housing Alternative B could occur closer to sensitive land uses than the screening distances shown in Table 7B.2-2, Additional Housing Alternative B could result in a significant health risk impact, similar to the proposed Project. Additionally, as discussed in Impact 7B.2-5, as with the proposed Project, the health risks from TACs from operation of laboratories under this alternative are considered significant. Similar to the proposed Project, these represent impacts where the contribution of Additional Housing Alternative B could also be cumulatively considerable. Consequently, mitigation measures are identified for Additional Housing Alternative B, the same mitigation as that identified for the proposed Project, to address these impacts of Additional Housing Alternative B.

Under the Community Air Risk Evaluation (CARE) program, the BAAQMD identified communities in the Bay Area subject to high TAC emissions, with sensitive populations that could be affected by them. The most recent CARE retrospective document indicates that there are no cumulatively impacted communities within five miles of the Project site. Similar to the proposed Project, given that Additional Housing Alternative B contributions to localized health risk would be less than significant with mitigation, as described in Impact 7B.2-3 and Impact 7B.2-5 for both construction and operations, and that there are no impacted CARE communities in the Project vicinity, Additional Housing Alternative B cumulative impact to local health risk and hazards would be reduced to less than cumulative considerable, and therefore a less than significant level with identified mitigation.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7B.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Mitigation Measure 7B.2-5: *Laboratory Fume Hood Emission Control*

Significance after Mitigation: Less than Significant.

Biological Resources

Construction and Operational Impacts

Impact 7B.3-1: Additional Housing Alternative B activities could result in adverse effects on special-status and migratory birds. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction under this alternative, tree and shrub pruning or removal, or grading could directly impact nesting birds by damaging or destroying nests, causing adults to abandon nests, or directly killing or injuring nesting birds. Additionally, construction activity, such as elevated sound levels and vibrations from heavy construction equipment, could cause adult birds to abandon nests. Due to the greater level of on-campus construction and larger development footprint under this alternative, there would be a greater potential for these impacts to occur than under the proposed Project. Similar to the proposed Project, implementation of this alternative could result in significant impacts to special-status and migratory birds.

As with the proposed Project, indirect effects to birds under this alternative would be unlikely during operation of facilities because birds nesting in or near existing campus buildings and facilities would most likely be acclimated to the noise and activity associated with campus activity. Consequently, similar to the proposed Project, operational impacts on nesting birds under this alternative would be less than significant.

The mitigation identified for the proposed Project, the following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce impacts of construction on nesting birds, including raptors and other migratory bird species protected by the MBTA, to a level that is less than significant. If Mitigation Measure 7B.3-1(a) is implemented, no further mitigation measures are required. In the event that Mitigation Measure 7B.3-1(a) cannot feasibly be implemented, then implementation of Mitigation Measures 7B.3-1(b) through (e) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 7B.3-1(a):** *Avoid tree removal and commencement of outdoor construction activities during nesting season.* Tree removal or pruning associated with project construction and commencement of outdoor project construction activities shall be avoided from February 1 through August 31, the primary local bird nesting season, to the extent feasible. If no tree removal or pruning associated with project construction is

proposed during the nesting period and outdoor project construction activities will commence outside the nesting period, no surveys for active bird nests are required.

Or

Mitigation Measure 7B.3-1(b): *Survey for active bird nests within 250 feet of construction sites.* If the County Planning Office determines that compliance with Mitigation Measure 7B.3-1(a) is not feasible because the timing of a construction project necessitates construction-related tree removal/pruning during the nesting season and/or commencement of outdoor construction activities during the nesting season, within seven days prior to the proposed start of construction activities an independent, qualified biologist approved by the County shall conduct a nesting bird survey of all potential habitat at the construction site and within 250 feet of the perimeter of the construction site. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 7B.3-1(c): *Minimize impacts to active bird nests.* If any active nests are detected during the pre-construction survey, an independent, qualified biologist approved by the County shall recommend a work-exclusion buffer zone that shall be designated around the active nest to allow for both the successful fledging of the birds and initiation of work on some portions of the project site. The work-exclusion zone(s) shall be reviewed and approved by the County Planning Office prior to commencement of construction. A qualified biologist shall monitor any occupied nest located within a protective buffer zone in order to determine if the designated buffer zone is effective and when the buffer zone is no longer needed. If the buffer zone is determined to be ineffective, its size shall be increased until it is effective, or work shall cease until the young have fledged and are independent of the nest.

Mitigation Measure 7B.3-1(d): *Delay activity***.** If no sufficient work-exclusion zone(s) are possible, then there shall be a delay in the start of construction until the active nest is no longer occupied. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used.

Mitigation Measure 7B.3-1(e): *Remove nest starts.* A qualified biologist can visit project sites at any time prior to tree removal or the initiation of outdoor construction work in order to find and remove nest starts which do not have eggs or nestlings present. This activity will minimize impacts to birds as they will generally move elsewhere and restart their nest building process.

Significance after Mitigation: Less than Significant.

Impact 7B.3-2: Additional Housing Alternative B activities could result in adverse effects on special-status bats. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on infill and redevelopment sites, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction of individual projects under this alternative, activities such as building demolition, tree and shrub removal, grading, and new

building construction could directly impact roosting special-status bats, and elevated sound levels from heavy construction equipment could cause adult bats to abandon maternity roosts. Due to the greater level of on-campus construction activity under this alternative compared to the proposed Project, there would be the potential for more disturbance to bats to occur under this alternative. Similar to the proposed Project, construction activities under this alternative could result in significant impacts to special-status bats.

As with the proposed Project, indirect effects to bats during operation of facilities under this alternative would be unlikely because bats roosting in or near existing campus facilities would be acclimated to light, noise and activity associated with campus operations. Consequently, similar to the proposed Project, operational impacts on special-status bats would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce construction impacts on special-status bats to a level that is less than significant. If Mitigation Measure 7B.3-2(a) is implemented, and no roosting bats are identified, no further mitigation measures are required. In the event that Mitigation Measure 7B.3-2(a) identifies roosting bats, then implementation of Mitigation Measures 7B.3-2(b), (c), and/or (d) would reduce this impact to a less-than-significant level.

> **Mitigation Measure 7B.3-2(a):** *Conduct pre-project survey.* Prior to project construction, an independent, qualified bat biologist approved by the County shall conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be demolished within the work area and within a 50-foot radius of the work area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits. If no roosting bats are found, no further action is required. If a bat roost is found, Stanford shall implement the following measures to avoid impacts on roosting bats.
>
> **Mitigation Measure 7B.3-2(b):** *Evict non-maternal roosts.* If a non-maternal roost of bats is found in a tree or structure to be removed or demolished as part of project construction, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Removal or demolition should occur no sooner than at least two nights after the initial minor site modification (to alter airflow). This action allows bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of disturbance. Departure of the bats from the construction area shall be confirmed with a follow-up survey by a qualified bat biologist prior to start of construction.
>
> **Mitigation Measure 7B.3-2(c):** *Avoid maternal roosting areas.* If active maternity roosts are found in trees or structures that will be removed or demolished as part of project construction, tree removal or demolition of that structure shall commence and be completed before maternity colonies form (generally before March 1) or shall not commence until after young are flying (generally after July 31). Active maternal roosts shall not be disturbed.
>
> **Mitigation Measure 7B.3-2(d):** *Develop and employ bat nest box plan.* If special-status bats are found in trees or structures to be removed or demolished as part of project construction, Stanford shall develop and implement a Bat Nest Box Plan for the Stanford campus employing current bat nest box technology. The design and placement of nest

boxes shall be reviewed by an independent, qualified bat biologist and shall be consistent with Stanford's anticipated long-term planning and development activities.

Significance after Mitigation: Less than Significant.

Impact 7B.3-3: Additional Housing Alternative B activities could result in adverse effects on the San Francisco dusky-footed woodrat. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, during construction of individual projects under this alternative, construction activities in wooded or brushy habitats could result in direct impacts to dusky-footed woodrats. As with the proposed Project, direct impacts during construction of this alternative could include mortality of adults or young, as well as destruction of woodrat stick nests where construction takes place in the Lathrop or Lagunita Development Districts. It should be noted that none of the additional housing proposed under this alternative would be located within the Lathrop or Lagunita Development Districts; consequently, this alternative would have similar impacts to the dusky-footed woodrats in these areas as the proposed Project. Similar to the proposed Project, construction activities associated with this alternative could result in significant impacts to San Francisco dusky-footed woodrat.

As with the proposed Project, indirect impacts to dusky-footed woodrat due to increased predation caused by expanding the range of urban-adapted predators would not occur because development of new academic and academic support and residential uses within the Academic Growth Boundary would occur in an urban environment, where these predator species are already present. Similarly, this alternative would not introduce increased nighttime lighting, noise or other human disturbances in areas where such conditions do not already exist. Consequently, similar to the proposed Project, operational impacts on the dusky-footed woodrat under this alternative would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce the impacts of construction to San Francisco dusky-footed woodrats to a level that is less than significant. If Mitigation Measure 7B.3-3(a) is implemented, and no San Francisco dusky-footed woodrat nests are identified, no further mitigation measures are required. In the event that Mitigation Measure 7B.3-2(a) identifies active nests, then implementation of Mitigation Measures 7B.3-2(b) and/or (c) would reduce this impact to a less-than-significant level.

Mitigation Measure 7B.3-3(a): *Surveys.* Prior to any clearing of vegetation within the Lathrop Development District, Lagunita and adjacent uplands, jurisdictional waterways/wetlands, or lands on the Project site outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a survey for San Francisco dusky-footed woodrat nests within the project area. The survey results shall be provided to the County Planning Office prior to issuance of site demolition, grading or building permits.

Mitigation Measure 7B.3-3(b): *Avoidance***.** Where feasible, an exclusion buffer of at least 10 feet from these nests shall be established and clearly demarcated to avoid moving or bumping the nests or the logs or branches on which the nests rest.

Mitigation Measure 7B.3-3(c): *Mitigation.* If establishing a buffer and avoiding the nests is not feasible, the nests shall be dismantled and the nesting material moved to a new location outside the project's impact areas so that it can be used by woodrats to construct new nests. Prior to nest deconstruction, each active nest shall be disturbed by a qualified wildlife biologist to the degree that all woodrats leave the nest and seek cover out of the impact area. Whether the nest is on the ground or in a tree, the nest shall be slightly disturbed (nudged) to cause the woodrats to flee. For tree nests, a tarp shall be placed below the nest and the nest dismantled using hand tools (either from the ground or from a lift). The nest material shall then be piled at the base of a nearby tree or large shrub outside of the impact area.

Significance after Mitigation: Less than Significant.

Impact 7B.3-4: Additional Housing Alternative B construction activities could result in adverse effects on special-status plant species. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, than would occur under the proposed Project. Natural areas within the Academic Growth Boundary contain potentially suitable habitat for rare, threatened or endangered plant species. Similar to the proposed Project, during construction of individual projects under this alternative, construction activities such as grading and ground-disturbing activity in these locations could result in loss of rare, threatened or endangered plant species. As with the proposed Project, construction activities under this alternative could result in significant impacts to special-status plant species. Since the additional housing that would be developed under this alternative would be located primarily on infill and redevelopment sites, potential impacts on special-status plant species under this alternative would similar to the proposed Project.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would reduce impacts to special-status plant species to a level that is less-than-significant. If Mitigation Measure 7B.3-4(a) is implemented, and no special-status plant species are identified, no further mitigation measures are required. In the event that Mitigation Measure 7B.3-4(a) identifies such species, then implementation of Mitigation Measures 7B.3-4(b) and/or (c) would reduce this impact to a less-than-significant level.

Mitigation Measure 7B.3-4(a): *Surveys.* If construction is proposed within any jurisdictional waterways/wetland areas, Lagunita basin and adjacent uplands, the Lathrop Development District, or Project site lands outside the Academic Growth Boundary, an independent, qualified biologist approved by the County shall conduct a focused survey for special-status plant species prior to ground disturbance during the late winter/early spring period when most local native plant species are flowering and most easily identified. The survey results shall be provided to the County Planning Office prior to

issuance of site demolition, grading or building permits. If special status plant surveying during flowering period is not possible, development within sensitive habitat areas shall be avoided unless approved by CDFW and the County Planning Office.

Mitigation Measure 7B.3-4(b): *Avoidance.* Construction activities shall avoid impacts to special-status plant species by establishing a buffer zone around the individuals in question. The buffer size shall be determined by an independent, qualified biologist approved by the County in order to avoid potential disturbance. The width of the buffer shall depend on a consideration of site-specific characteristics, including the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, soils, physical and chemical characteristics) and adjacent uses (e.g., sprinkler irrigation or shading from buildings or other structures). The buffer zone shall be clearly demarcated using exclusion fencing.

Mitigation Measure 7B.3-4(c): *Mitigation if avoidance is not feasible.* If the County Planning Office determines that establishing an avoidance buffer is not feasible, individual plants (including seeds) shall be transplanted to an area with suitable physical and biological conditions on the Project site outside of the Academic Growth Boundary and monitored and adaptively managed for five years. Transplantation may be accomplished by relocating individual plants or through seed collection and dispersal, or a combination of both, to be determined based on the species.

Significance after Mitigation: Less than Significant.

Impact 7B.3-5: Additional Housing Alternative B activities would not result in significant effects on federal and state protected species covered by the Stanford Habitat Conservation Plan. (*Less than Significant*)

Implementation of the Stanford Habitat Conservation Plan (HCP) satisfies the requirements of both the federal and state endangered species acts. The three species covered by the Stanford HCP and incidental take permit (ITP) are: California red-legged frog (CRLF); California tiger salamander (CTS); and San Francisco gartersnake. As is the case for the proposed Project, because Stanford is required by U.S. Fish and Wildlife Service (USFWS) to implement the HCP, impacts to Covered Species from construction and operation under this alternative would be less-than-significant. Impacts under this alternative would be similar to proposed Project impacts.

Mitigation: None required.

Impact 7B.3-6: Additional Housing Alternative B activities could result in significant effects on steelhead. (*Potentially Significant*)

Steelhead are found exclusively outside the Academic Growth Boundary within the San Francisquito Creek watershed. Similar to the proposed Project, while all new academic and residential development under Additional Housing Alternative B would occur within the Academic Growth Boundary, Stanford could also construct certain infrastructure improvements, as well as

on-going habitat improvements and conservation projects, outside the Academic Growth Boundary under this alternative.

Similar for the proposed Project, the County approved a Special Conservation Area Plan that would protect steelhead from construction and operational activities at Stanford, including those activities that would occur under this alternative. As under the proposed Project, because construction of infrastructure, as well as on-going habitat improvement and conservation projects, could adversely affect steelhead by rendering habitat less hospitable in the short term due to increases in sediment loading and disturbance, construction activities under this alternative would have a significant impact on steelhead. Impacts under this alternative would be similar to proposed Project impacts.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would serve to further ensure that impacts to steelhead would be reduced to a level that is less-than-significant. If Mitigation Measure 7B.3-6(a) is implemented, and no work is conducted within 150 feet of top of bank of a creek, no further mitigation measures are required. In the event that implementation of Mitigation Measure 7B.3-6(a) is infeasible, then implementation of Mitigation Measures 7B.3-6(b) would reduce the significance of this impact under this alternative to a less-than-significant level.

> **Mitigation Measure 7B.3-6(a):** *Habitat avoidance*. Grading or ground-disturbing activities within 150 feet of the top of bank of a creek that supports steelhead shall be avoided.
>
> **Mitigation Measure 7B.3-6(b):** *Protective measures*. If the County Planning Office determines that avoidance of steelhead habitat is not feasible, Stanford shall obtain any required permits and approvals from federal and state wildlife agencies as well as a Streambed Alteration Agreement. Such permits and approvals shall specify the conditions under which construction activities may occur, including any applicable construction windows, installation of coffer dams or other measures necessary to protect steelhead.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7B.3-7: Additional Housing Alternative B activities could result in substantial loss or degradation of riparian habitat. (*Potentially Significant*)

Similar to the proposed Project, construction of infrastructure, habitat improvement and conservation projects under this alternative, including channel modifications and/or removal of man-made facilities and barriers to steelhead migration could occur within riparian habitat on the Project site outside of the Academic Growth Boundary. Stanford's activities in riparian areas are subject to the USFWS-approved Stanford HCP and the County-approved Special Conservation Area Plan which state that Stanford will protect habitat and use effective mitigation measures. Nevertheless, similar to the proposed Project, under this alternative, potential construction activity within riparian habitats on the Project site outside the Academic Growth Boundary could result in a significant impact to riparian habitat. Impacts under this alternative would be similar to proposed Project impacts.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would mitigate impacts to riparian habitat to less-than-significant levels. If Mitigation Measure 7B.3-7(a) is implemented, and no work is conducted within 150 feet of riparian habitat, no further mitigation measures are required. In the event that implementation of Mitigation Measure 7B.3-7(a) is infeasible, then implementation of Mitigation Measures 7B.3-7(b) would reduce the significance of this impact to a less-than-significant level.

> **Mitigation Measure 7B.3-7(a):** Grading or ground-disturbing activities within 150 feet of riparian habitat shall be avoided.
>
> **Mitigation Measure 7B.3-7(b):** If the County Planning Office determines that avoidance is not feasible, Stanford shall obtain all appropriate permits for wetland or other work within the riparian area from the Corps, USFWS, NMFS and CDFW. As specified by agency permits, any riparian habitat areas lost as a result of project development would be replaced through the creation, preservation or restoration of equivalent habitat at an appropriate mitigation ratio or through other measures that the agencies deem appropriate and approve in order to adequately mitigate the impact.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7B.3-8: Additional Housing Alternative B activities could result in the loss of native oak woodland habitat. (*Potentially Significant*)

In Santa Clara County, a decrease of 0.5-acre or more in the native oak canopy of an individual oak woodland is considered a significant impact. Similar to the proposed Project, under this alternative, potential removal of oaks within the oak woodland/savannah community as a result of development and/or infrastructure improvements in the Lathrop Development District, or necessary infrastructure improvements that may occur outside the Academic Growth Boundary, would have the potential to result in a significant direct impact to oak woodland. None of the additional housing proposed by this alternative would be located within the Lathrop Development District or outside the Academic Growth Boundary areas; consequently, this alternative would have similar impacts to oak woodlands in these areas as the proposed Project.

As with the proposed Project, operational activities associated with this alternative would not be expected to result in indirect impacts to oak woodland because operations are not likely to introduce non-native plant species that outcompete native oak trees, or introduce Sudden Oak Death into the oak woodlands. Consequently, similar to the proposed Project operational impacts on native oak woodland habitat under this alternative would be less than significant.

The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, and which are modeled on the Planning Office Guide to Evaluating Oak Woodlands Impacts, would reduce impacts to oak woodlands to a level that is less-than-significant.

Mitigation Measure 7B.3-8(a): Prior to oak tree removal within the Lathrop Development District, a tree removal plan and arborist report shall be submitted which identifies the species type, acreage, diameter, and amount of canopy of oak trees proposed for removal. The arborist report shall be prepared by an I.S.A. Certified Arborist, Registered Professional Forester, or another professional approved by the County Planning Office.

Mitigation Measure 7B.3-8(b): If the proposed oak tree removal would result in a decrease of 0.5-acre or more of native oak canopy on the project site, at least two of the following three mitigation measures shall be implemented:

1) *Planting Replacement of Oak Trees*. Pursuant to Public Resources Code Section 21083.4, the planting of oaks shall not fulfill more than 50 percent of the mitigation requirement for the project.

   Tree replacement can be dependent upon the size of the canopy of the removed trees, the number of trees to be removed, the size of trees to be removed, the type of trees to be removed, the steepness of the slope on which trees will be removed, or the amount of room on a parcel in which trees can be planted. The objective of tree planting shall be to restore former oak woodland at a ratio of 2:1 or 3:1 based on the condition of the oak woodland habitat. 2:1 restoration is recommended for medium quality oak woodland habitat, and 3:1 restoration is recommended for high quality oak woodland habitat.

   The following standard mitigation ratios shall be used, unless a different ratio is applied by the Planning Office based on site-specific characteristics:

   - For the removal of one small tree (5-18 inches): two 24-inch boxed trees or three 15 gallon trees.
   - For the removal of 1 medium tree (18-24 inches): three 24-inch boxed trees or four 15 gallon trees.
   - For the removal of a tree larger than 24 inches: four 24-inch boxed trees or five 15 gallon trees.

   All tree replacement shall be with in-kind species, unless alternate species are approved by the county. A Tree Planting and Maintenance Plan shall be submitted showing species, size, spacing and location of plantings and the location and species of established vegetation. Tree plantings shall be monitored for five years following planting and a survival rate of 75% will be required. Should the planted trees fail to meet the established performance and survival criteria, Stanford shall be responsible for additional plantings and management activities necessary to ensure the long-term success of planted mitigation trees.

2) *Conservation Easement.* Protect existing native oak trees on or off the project site from future development through a conservation easement or fee title dedication to the County or a land conservation group approved by the County.

   Oak woodland offered as mitigation must be configured in such a manner as to best preserve the integrity of the oak ecosystem and minimize the ratio of edge to area. Priority should be given to conserving oak habitat adjacent to existing woodlands under conservation easements, public lands or open space lands. The protection of existing oak woodlands through conservation easements shall mitigate for the loss of

oaks at a ratio equal to 2:1 (for medium quality oak woodland habitat) or 3:1 (for high quality oak woodland habitat) as determined by the County Planning Office. Land proposed as mitigation, when viewed with adjacent protected conservation land, should not result in conserved parcels of less than one acre.

3) *Other Options*. If the County Planning Office determines that there are no feasible sites for oak woodland mitigation on Stanford lands, then Stanford shall submit a plan for review and approval by the County Planning Office that provides for the conservation of oak woodlands elsewhere in Santa Clara County in the same manner as 7B.3-8(b)(2).

   This plan must include protection of an existing oak ecosystem through a conservation easement or fee title dedication to the County or other local agency or organization responsible for the oak woodlands preservation.

Significance after Mitigation: Less than Significant.

Impact 7B.3-9: Additional Housing Alternative B construction activities could result in substantial adverse effects on jurisdictional waters and wetlands. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit and therefore, would involve more construction, than would occur under the proposed Project. Similar to the proposed Project, construction of new buildings and infrastructure, and on-going habitat enhancements/improvements and conservation projects under this alternative could necessitate filling or altering waters and wetlands through sediment delivery, discharge of contaminants, or interruption of hydrological flow. While, similar to the proposed Project, only a small quantity of jurisdictional waters or wetlands are located in areas upon which building development under this alternative could be constructed, infrastructure and habitat enhancement improvements could indirectly affect jurisdictional waters and wetlands in all locations in which such features are present. As under the proposed Project, construction activities under this alternative could result in significant impacts to jurisdictional waters and wetlands. Impacts under this alternative would be similar to proposed Project impacts. The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would mitigate impacts to jurisdictional waters and wetlands to less-than-significant levels.

Mitigation Measure 7B.3-9(a): *Jurisdictional waters and wetland identification.* Stanford has provided a wetland delineation that covers the lands within the Academic Growth Boundary. Prior to grading or ground-disturbing activities on lands outside the Academic Growth Boundary, the County shall determine whether the existing wetland delineation is adequate to assess the project's impacts and, if not, an independent, qualified wetland biologist approved by the County shall delineate jurisdictional waters or wetlands on and within 250 feet of the construction site.

Mitigation Measure 7B.3-9(b): *Jurisdictional waters and wetlands avoidance.* For all projects grading or ground-disturbing activities within 250 feet of jurisdictional waters or

wetlands shall be avoided unless the County Planning Office determines that avoidance is not feasible.

Mitigation Measure 7B.3-9(c): *Jurisdictional waters or wetland replacement.* If the County Planning Office determines that avoidance of jurisdictional waters or wetlands is not feasible, Stanford shall obtain all appropriate permits or approval for work in jurisdictional waters (i.e., Waters of the State or Waters of the U.S.), from applicable agencies, including but not necessarily limited to, the U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, and California State Department of Fish and Wildlife. Any jurisdictional waters or wetlands that are filled as a result of project development shall be replaced through the creation, preservation or restoration of jurisdictional waters or wetlands or through other measures that the agencies deem appropriate through permit requirements to adequately mitigate the impact. Potential measures may include the following:

- For creek projects, remove hardscape features from the stream channel and stream banks.
- Stabilize exposed slopes or streambanks immediately upon completion of construction activities.
- To restore disturbed aquatic sites, a wetland mitigation and monitoring plan will be prepared that outlines the objectives to mitigate for construction impacts. At a minimum the plan will include thresholds of replanting success (e.g., 90 percent plant survival after one year, 80 percent second year, and 70 percent third year), monitoring requirements (e.g., at least once each year to confirm site stability, plant viability, and to schedule weeding, as needed), and shall specify resource agency reporting requirements.

Significance after Mitigation: Less than Significant.

Impact 7B.3-10: Implementation of Additional Housing Alternative B would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant*)

Similar to the proposed Project, while construction activities associated with infrastructure improvements and on-going habitat enhancement improvements under Additional Housing Alternative B could temporarily impede wildlife movement, such improvements would not result in substantial long-term interference. Implementation of the required USFWS-approved Stanford HCP and County-approved Special Conservation Area Plan measures would ensure that impacts to movement corridors and nursery sites for fish and wildlife on Project site lands outside the Academic Growth Boundary and CTS movement corridors within the oak woodland/savannah community within the Academic Growth Boundary would be less-than-significant. Impacts under this alternative would be similar to proposed Project impacts.

Mitigation: None required.

Impact 7B.3-11: Implementation of Additional Housing Alternative B could conflict with local Santa Clara County tree preservation ordinance. (*Potentially Significant*)

Similar to the proposed Project, construction of academic facilities, housing units and infrastructure improvements under Additional Housing Alternative B could result in the need to remove trees that are protected by the Santa Clara County tree preservation ordinance. Notwithstanding protections provided by the County tree preservation ordinance, construction activities under this alternative could result in significant impacts to protected trees, similar to the proposed Project. More trees may potentially be impacted under this alternative compared the proposed Project because there would be more construction and larger development footprint under this alternative. The following mitigation measures identified for this alternative, which are the same as those identified for the proposed Project, would ensure compliance with the County's tree preservation ordinance:

Mitigation Measure 7B.3-11(a): A "tree" is defined a woody plant having a single trunk measuring at least 37.7 inches in circumference (12 inches or more in diameter) or in the case of multi-trunk trees, a trunk size of 75.4 inches in circumference (24 inches in diameter). A protected tree on the Stanford campus is a:

- heritage tree (if included on the County's heritage resource inventory adopted by resolution of the Board of Supervisors);
- a tree planted or retained as required by conditions of approval of County permits;
- and a tree located within County rights-of-way and easements.

Stanford shall not remove a protected tree unless:

1. Removal of the protected tree is authorized by a County land use approval for which a grading or building permit has been issued.
2. Removal of the protected tree is authorized by a County-issued administrative permit or encroachment permit for tree removal; or
3. Removal of the protected tree is exempt. In addition to trees removed pursuant to a County land use approval, the ordinance currently exempts removal of a protected tree in the following circumstances:
    - the tree is diseased, dead, or dying or substantially damaged from natural causes;
    - tree cutting is needed to remove a hazard to life and personal property; and
    - maintenance work within public utility easements

Mitigation Measure 7B.3-11(b): Issuance of a land use permit, administrative permit or encroachment permit that authorizes removal of a protected tree shall be conditioned as follows:

1. Protected trees shall be replaced at a ratio of 3:1 for oaks and 1:1 for other protected trees; or
2. Stanford may submit a Vegetation Management Plan for the entire campus to the County Planning Office for review and approval. This plan must provide for the same or greater level of tree protection as the measures described in Mitigation Measure 7B.3-11(b)(1).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7B.3-12: Implementation of Additional Housing Alternative B could cumulatively cause an adverse impact to biological resources. (*Potentially Significant*)

Cumulative impacts analysis considers the effects of Project implementation in combination with those of proximate past, present, and reasonably foreseeable future projects, and whether the project's contribution to the cumulative impact would be significant. Stanford's lands outside the Academic Growth Boundary in unincorporated Santa Clara County are relatively isolated, covering a large area adjacent to other largely undeveloped lands, including Stanford's 1,200-acre Jasper Ridge Biological Preserve, which is maintained for research and education and closed to recreational use. On the Stanford HCP lands, which include most of the Project site as well as adjacent Stanford-owned land in the City of Palo Alto, creek restoration, invasive species removal and vegetation management activities are ongoing. These activities may cause minor disturbance to habitat areas, but the long-term impact would be beneficial to sensitive natural communities and to special status plants and wildlife.

Stanford is also considering a range of alternatives at the Searsville dam and reservoir that could provide fish passage, allow natural annual sediment load to flow downstream, create a replacement water diversion downstream, and relocate Searsville water storage functions to an expanded Felt Reservoir. Stanford acknowledges that such improvements would require comprehensive and coordinated collaboration with federal, State and local agencies, including the San Francisquito Creek Joint Powers Authority (SFCJPA), its local government members, and local community and residents in the watershed. No specific alternative has been selected or approved at this time.

In addition, the SFCJPA is currently undergoing environmental review of a range of alternatives to address flow capacity deficiencies in San Francisquito Creek to reduce flooding potential, and enhance ecosystems and recreation. Alternatives include potential channel and/or potential bypass improvements within the creek downstream of Stanford; and constructing one or more detention basin improvements, including on Stanford lands within the Project site (e.g., Lagunita, Felt Reservoir) and outside the Project site (e.g. Searsville Reservoir and within the Jasper Preserve). No specific alternative has been selected or approved at this time.

Otherwise, urbanized areas of adjacent jurisdictions, including within Palo Alto, are adjacent to largely developed areas of the Project site (i.e., those areas within the Academic Growth Boundary). As discussed in Chapter 5.0 of the Draft EIR, Stanford is currently in the midst of constructing the remaining housing and academic and academic support facilities authorized under the 2000 General Use Permit within the Academic Growth Boundary. While the timing of construction has the potential to increase temporary impacts on biological resources from tree removal, noise disturbance, and other impacts, impacts would be limited to the immediate construction area within the Academic Growth Boundary, which has limited biological value. Additional non-Project cumulative development in adjacent jurisdictions would be expected to

continue to occur over the duration of the 2018 General Use Permit and would be subject to applicable regulations and environmental review requirements of those jurisdictions.

Special Status Plants and Wildlife

As discussed above, activities under this alternative would result in potential impacts to special-status plants and wildlife. Similar to mitigation identified for the proposed Project, implementation of Mitigation Measures 7B3-1(a)-(e), 7B.3-2(a)-(d), 7B.3-3(a)-(c), 7B.3-4(a)-(b), and 7B.3-6(a)-(c) identified for this alternative would require plant and nesting bird, bat, and dusky-footed woodrat surveys and avoidance and minimization of potential impacts to special-status species and their habitat, including corridors; and reduction of any potentially impacts to special-status plants and wildlife to a less than significant level. Other cumulative development projects outside the Project site would also be required to comply with applicable federal and State regulations protecting special-status species through implementation of similar mitigation measures during construction by those jurisdictions. Activities associated with this alternative would cause a small amount of loss of undeveloped habitat in the area, principally within the Academic Growth Boundary. However, similar to the proposed Project, with the implementation of these measures, this alternative would not have a cumulatively considerable contribution to impacts on special status species.

Nesting Birds

As discussed above, activities under this alternative could result in potential impacts to nesting migratory birds, including special-status species. Similar to mitigation identified for the proposed Project, implementation of Mitigation Measure 7B.3-1(a)-(b) for this alternative would require preconstruction nesting bird surveys and avoidance of known nest sites, thereby minimizing this impact under this alternative to a less than significant level. Other cumulative projects for creek restoration, invasive species removal and vegetation management may also impact nesting birds, but would also be required to comply with applicable regulations protecting nesting birds, through implementation of similar mitigation measures during construction by those jurisdictions. Similar to the proposed Project, with the implementation of these measures, implementation of this alternative would not have a cumulatively considerable contribution to impacts on nesting birds.

Steelhead

The Project site contains a segment of San Francisquito Creek that provides habitat for steelhead. As discussed above, in addition to implementing the County Special Conservation Area Plan guidelines to minimize disturbance to steelhead, Stanford must obtain permits and approvals from applicable federal and state wildlife and water quality agencies to perform work in creeks that support steelhead; see Mitigation Measure 7B.3-6(a)-(c). These permits, including a Streambed Alteration Agreement, specify the conditions under which construction activities may occur, including construction windows, cofferdams or other measures necessary to protect steelhead. Other cumulative projects would also be required to comply with applicable federal and State regulations protecting steelhead and other fish, through implementation of similar mitigation measures during construction by those jurisdictions. Similar to the proposed Project, with the implementation of these measures, this alternative would not have a cumulatively considerable contribution to impacts on steelhead.

Wetlands, Waters and Sensitive Riparian Communities

Construction under this alternative could result in impacts to riparian habitat or jurisdictional waters of the United States and waters of the State. As discussed above, Mitigation Measures 7B.3-7(a)-(b) and 7B.3-9(a)-(c) would minimize disturbance, and mitigate for necessary disturbance to sensitive riparian areas, wetlands and waters. As with special-status species, other cumulative projects would be required to comply with applicable federal and State regulations protecting riparian habitat and jurisdictional waters by those jurisdictions. Similar to the proposed Project, the potential impacts of this alternative in combination with other projects would not contribute to a cumulatively significant impact on riparian habitat, and jurisdictional waters of the United States and waters of the State, including drainages and seasonal wetlands.

Oak Woodlands

As discussed above, construction under this alternative could result in impacts to sensitive oak woodland habitat from ongoing and future development projects. Mitigation Measures 7B.3-8(a)-(b) and 5.3.11(a)-(c) would minimize disturbance and mitigate for necessary disturbance to oak woodlands, including protected trees. Other cumulative projects outside the Project site would also be required to comply with applicable federal and State regulations protecting oak woodlands of those jurisdictions. The potential impacts of this alternative in combination with other projects would not contribute to a cumulatively significant impact on oak woodland communities.

As discussed above, all biological impacts associated with construction and operation of Additional Housing Alternative B would be mitigated to a less than significant level. There are no biological impacts of this alternative that, when considered in combination with other cumulative development, would make a considerable contribution to cumulative effects.

> **Mitigation:** Implement Mitigation Measures 7B.3-1(a)-(b), 7B.3-2(a)-(d), 7B.3-3 (a)-(c), 7B.3-4(a)-(b), 7B.3-6(a)-(c), 7B.3-7(a)-(b), 7B.3-8(a)-(b), 7B.3-9(a)-(c), and 7B.3.11(a)-(c).
>
> **Significance after Mitigation:** Less than Significant.

Cultural and Paleontological Resources

Construction and Operational Impacts

Impact 7B.4-1: Additional Housing Alternative B development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. (*Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on redevelopment and infill sites. As discussed in Section 5.4, the majority of historic resources within the Academic Growth Boundary are located in the Campus Center Development District. The additional housing proposed under this alternative would be located in the East Campus Development District,

within which only two eligible collegiate buildings exist; the DAPER and Administrative Development District, within which the stadium embankment is the only identified eligible collegiate property, and the Quarry and West Campus Development Districts, within which no eligible collegiate buildings are identified. Consequently, this alternative could have an incrementally greater potential than the proposed Project to result in direct, physical impacts to historic resources and infill development that could alter the setting and surrounding environment of historic resources and result in indirect impacts.

Implementation of **Mitigation Measures 7B.4-1(a)-(e)** identified for this alternative, which are the same as those identified for the proposed Project, would provide a formal framework for conditions protecting historic resources. Similar to the proposed Project, while it is considered unlikely that Stanford would demolish any of its historic buildings and structures within the Project site or alter them in a manner that does not comply with the Secretary of Interior Standards under this alternative, if such actions were to occur, they would result in a significant and unavoidable impact to historic resources. Pursuant to the established regulatory framework, the County would review these projects and prepare the appropriate project-specific CEQA environmental review, and if a significant impact were to be identified additional feasible mitigation for these individual projects may be identified at that time to avoid or reduce the magnitude of the significant impact. The project-specific CEQA environmental review would include an evaluation of the feasibility of preserving the historic resource.

> **Mitigation Measure 7B.4-1(a):** The Stanford University Historic Resources Survey dated April 2017 contains an evaluation of all buildings and structures located within the Stanford Community Plan's Academic Campus land use designation that were constructed prior to 1976. Prior to 2025, Stanford shall provide to the County Planning Office for the review and approval of the County Planning Director (or designated representative) an additional survey of structures built within the Academic Campus land use designation between 1976 and 1985 ("Survey Addendum"). At its discretion, the County Planning Office may require a peer review of the Survey Addendum by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.
>
> **Mitigation Measure 7B.4-1(b):** For any building project that involves demolition of an historical resource that is listed or has been identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review of the project. Consistent with the County's process the analysis of project impacts, alternatives and mitigation will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to approval.
>
> **Mitigation Measure 7B.4-1(c):** For any proposed building project that involves remodeling, alteration, or a potential physical effect on an historical resource that is listed or identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey or Survey Addendum, Stanford shall meet the following requirements:
>
> 1) The proposed building project shall be consistent with the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1995) ("Secretary of Interior's Standards"). Stanford shall submit documentation to

the County prepared by a qualified professional to demonstrate consistency of the proposed project with the Secretary of the Interior's Standards. If the work to be performed constitutes basic maintenance, repair or replacement, Stanford shall mark the project plans with text stating: "Exterior work is limited to replacement of deteriorated materials with in-kind materials that match the old. Project plans have been reviewed by [Name of Architect], who has determined the work would comply with the Secretary of Interior's Standards." If the work to be performed is more extensive than basic maintenance, repair or replacement in kind, Stanford shall submit a letter along with the project plans explaining the basis for the University Architect's Office determination that the work would comply with the Secretary of Interior's Standards. The County Planning Office will review the marked plans or letter, and may require additional documentation.

2) The requirement that the building project must be consistent with the Secretary of the Interior's Standards shall be primarily limited to alterations to the exterior. Building interiors will be exempt from such a consistency requirement, except for interior spaces that are open to the general public on an ongoing basis. Such buildings are listed below along with their public interior spaces.

Historic Resource	Primary public space(s) subject to review (if integrity present)	Secondary space(s): no review required
Cantor Center/ Stanford Museum	Lobby and galleries on first and second floors of 1891 and 1902 wings	Restrooms, staff offices, collection storage areas, all basement areas and all spaces in 1999 addition
Memorial Church	Main sanctuary, entry vestibule, organ and choir lofts	Restrooms, offices and store rooms, all basement areas
Art Gallery	Vestibule and gallery space	Restrooms, offices and store rooms, all basement areas
Hoover Tower	Lobby, galleries, observation platform	Restrooms, offices and store rooms, all basement areas
Memorial Hall	Lobby, Pigott Theater, Auditorium	Restrooms, offices and store rooms, radio station
Frost Amphitheater	Terraces, stage	Restrooms, store rooms
Burnham Pavilion/ Ford Center	Lobby, main gym	Restrooms, locker rooms, offices, store rooms; all spaces in 1990 addition

3) The County Planning Office may require a peer review of the Secretary of the Interior's Standards consistency analysis by a qualified professional (Architect with preservation experience or Architectural Historian) at Stanford's expense.

4) If it is not feasible for the building project to be consistent with the Secretary of Interior's Standards, a project-specific analysis of the impact to historic resources and any feasible alternatives and mitigation measures shall be prepared as part of the CEQA environmental review. The analysis of impacts, alternatives and mitigation measures will be referred to the Santa Clara County Historical Heritage Commission for its recommendation prior to County approval.

Mitigation Measure 7B.4-1(d): For any building project that involves demolition, modification or significant alteration of a structure located outside of the Academic Campus land use designation that is 50 years old or more, Stanford may elect to follow

the Secretary of Interior's Standards. If Stanford does not elect to follow the Secretary of Interior's Standards for such a project Stanford shall submit an assessment regarding its eligibility for listing on the California Register ("Eligibility Assessment") to the County Planning Office. If the County Planning Office determines that the building/structure is eligible for listing on the California Register, then Stanford shall comply with the provisions in Sections 2 and 3 above and the building/structure shall be treated as if it were identified as eligible for listing in the Stanford Historic Resources Survey or Addendum for purposes of those Sections. The County Planning Office may require a peer review of the Eligibility Assessment by a qualified professional (Architect or Architectural Historian) at Stanford's expense.

Mitigation Measure 7B.4-1(e): Proposed new buildings located within 75 feet of an historic resource that is identified as eligible for listing on the California Register in the Stanford University Historic Resources Survey, Survey Addendum or Eligibility Assessment, measured from the nearest exterior walls, shall be reviewed by the University Architect to ensure that the design does not negatively impact the historic resources surrounding it. Stanford shall prepare design guidelines and submit a letter to the County Planning Office confirming that the new building construction has been reviewed by the University Architect's Office and is compatible with any historic resources located within 75 feet of the proposed new building. The County Planning Director (or designated representative) will review the letter prior to County approval of the new building. The County Planning Office may require a peer review of the University Architect's evaluation prior to approval of the building.

Significance after Mitigation: Significant and Unavoidable.

Impact 7B.4-2: Additional Housing Alternative B development could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. Consequently, this alternative would require greater excavation of soils related to underground utilities, construction of building foundations, and in some cases, to accommodate underground levels, than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to archaeological resources compared to the proposed Project.

Similar to the proposed Project, while no individual projects and specific locations have been identified for development under this alternative, if construction were to occur within the boundaries of a recorded prehistoric archaeological site, a project-specific analysis would be required to determine whether the site constituted a unique archaeological resource according to PRC Section 21083.2 or a historical resource according to PRC Section 21084.1, and if so, whether the site would be adversely affected, thus resulting in a significant impact. Also, similar to the proposed Project, it is possible that previously unknown prehistoric archaeological sites

could be unearthed during excavation or earthmoving activities for an individual project under the alternative. As under the proposed Project, this could result in a significant impact to a unique archaeological resource or a historical resource under this alternative.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant archaeological resources within the Project site. Individual projects under this alternative that would require a County building permit or other County approval would be subject to conditions of approval that include specific requirements addressing archaeological resources within the Project site. Implementation of **Mitigation Measure 7B.4-2(a)-(b)** identified for this alternative, which is the same as that identified for the proposed Project, would provide a formal framework for conditions providing protection of archaeological resources under this alternative. Similarly, implementation of this mitigation measure for this alternative would ensure that potential impacts to prehistoric and historic-period archaeological resources on the Project site would be reduced to a less-than-significant level.

> **Mitigation Measure 7B.4-2(a):** Stanford has provided a map to the County Planning Office, maintained as a confidential record, that shows the location of all known prehistoric and historic archaeological resources in the unincorporated Santa Clara County portion of Stanford lands. Stanford shall conduct a Record Search at the Northwest Information Center of the California Historical Resources Information System and submit an updated map each year as part of the 2018 General Use Permit annual monitoring and compliance process. This annual update will be the basis for evaluating potential impacts of future projects that include ground disturbance.
>
> At the discretion of the County Planning Office, project-related archaeological site assessments and monitoring shall be conducted and mitigation measures identified by either the Stanford University Archaeologist or an independent archaeologist retained by the County at Stanford's expense. All archaeological reports (including, but not limited to, site assessments, monitoring reports, Archaeological Treatment Plans) shall be forwarded to the County Planning Office for review at Stanford's expense. All work shall be performed by, or under the supervision of, an archaeologist that meets the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).
>
> Significant impacts from projects on prehistoric and historic archaeological resources shall be addressed as specified below:
>
> 1. If a building project is proposed to be situated on a mapped archaeological site, a qualified archaeologist shall conduct further project-specific analysis to determine whether a significant impact would occur. If the site is determined to be eligible and cannot be avoided, an Archaeological Resources Treatment Plan shall be prepared and approved by the County Planning Office prior to the commencement of ground disturbing activities. If a Stanford archaeologist performs this work, the County may at its discretion require a peer review by an independent qualified archaeologist at Stanford's expense. Project-specific mitigation, if necessary, shall be identified in accordance with the provisions of Section 21083.2 of the Public Resources Code.
>
> 2. In the event that previously unidentified historic or prehistoric archaeological resources are discovered during construction, the contractor shall cease work in the immediate area and the County. Planning Office and University Archaeologist shall be contacted immediately. The University Archaeologist shall provide and implement

a proposed Archaeological Resources Treatment Plan. At the discretion of the County Planning Director (or designated representative) an independent qualified archaeologist may be retained by the County at the expense of Stanford to assess the significance of the find and the adequacy of the proposed Archaeological Resources Treatment Plan.

3. Archaeological monitoring shall be conducted at any time construction-related ground-disturbing activities (greater than 12 inches in depth) are taking place within 100 feet of known archaeological resources. A technical report including the results of all monitoring activities shall be prepared once monitoring is completed in accordance with professional standards and submitted to the University Archaeologist. The archaeological monitoring shall be conducted or supervised by an individual meeting the Secretary of Interior Professional Qualifications Standards in Archaeology (36 CFR 61).

Mitigation Measure 7B.4-2(b): In the event that human skeletal remains are encountered, Stanford is required by County Ordinance No. B6-18 to immediately notify the County Coroner. Work shall immediately stop within a 100-foot radius of the find. If the County Coroner determines that the remains are Native American, the coroner shall contact the California Native American Heritage Commission, pursuant to Health and Safety Code Section 7050.5(c), and the County Coordinator of Indian affairs. No further disturbance of the site may be made except as authorized by the County Coroner. If artifacts are found in association with the human skeletal remains no further disturbance of the artifacts may be made until authorized by the County Planning Office. It is the responsibility of Stanford to provide for reburial of the human skeletal remains and associated artifacts following completion of the required Native American consultation process described Health and Safety Code section 7050.5(c); Stanford will file a State Record Form (DPR Series) documenting the reburial location with the California Historical Resources Information System and provide the location on the updated map provided for in Section 3 above.

Significance after Mitigation: Less than Significant.

Impact 7B.4-3: Additional Housing Alternative B development could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to paleontological resources during construction compared to the proposed Project.

Similar to the proposed Project, if excavation related to construction of development on the Project site under this alternative would uncover additional paleontological resources, this impact would be considered significant.

Existing County policies and regulatory mechanisms provide oversight at the County level to protect significant paleontological resources within the Project site. Individual projects under this alternative that would require a County building permit or other County approval would be subject to conditions of approval that include specific requirements addressing paleontological resources within the Project site. Implementation of **Mitigation Measure 7B.4-3** identified for this alternative, which are the same as those identified for the proposed Project, provides a formal framework for conditions providing protection of paleontological resources. Implementation of this mitigation measure would ensure that potential impacts to prehistoric and historic-period paleontological resources on the Project site for this alternative would be reduced to a less-than-significant level.

> **Mitigation Measure 7B.4-3:** In the event that potentially significant fossilized shell or bone is uncovered during any earth-disturbing operation, contractors shall stop work within 100 feet of the find and notify the University Archaeologist and the County Building Inspector assigned to the project. The University Archaeologist shall visit the site and make recommendations for treatment of the find (including but not limited to consultation with a paleontologist and excavation, if warranted), which shall be sent to the County Building Inspection Office and the County Planning Office. If a fossil find is confirmed, it will be recorded with the United States Geological Survey and curated in an appropriate repository.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7B.4-4: Additional Housing Alternative B Development could disturb human remains, including those interred outside of dedicated cemeteries. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative could have a greater potential to result in impacts to undiscovered human remains during construction compared to the proposed Project.

Although unlikely, there is the possibility that human remains, including those interred outside of dedicated cemeteries, could be encountered during ground-disturbing activities associated with new development under this alternative. As with the proposed Project, this impact would be considered significant for this alternative.

In the event that human skeletal remains are discovered during construction, implementation of **Mitigation Measure 7B.4-2(b)** identified for this alternative, as described under Impact 7B.4-2, which is the same as that identified for the proposed Project, requires the contractor to cease work within 100 feet and notify the County coroner. If the coroner determines that the bones are Native American, the coroner shall contact the California Native American Heritage Commission. Implementation of this mitigation measure for this alternative would ensure potential impacts to human remains would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure 7B.4-2(b).

Significance after Mitigation: Less than Significant.

Impact 7B.4-5: Additional Housing Alternative B development could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. (*Potentially Significant*)

Based on the results of the NAHC Sacred Lands File search, there are no documented tribal cultural resources on the Project site. However, there are numerous prehistoric archaeological sites on the Project site, many of which may be considered tribal cultural resources. Similar to the proposed Project, potential impacts to archaeological sites that are considered tribal cultural resources as a result of development under this alternative would be considered significant.

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and would involve more subsurface construction than the proposed Project. Based on the results of the NAHC Sacred Lands File search, there are no documented tribal cultural resources on the Project site. However, there are numerous prehistoric archaeological sites on the Project site, many of which may be considered tribal cultural resources. Similar to the proposed Project, potential impacts to archaeological sites that are considered tribal cultural resources as a result of development under this alternative would be considered significant.

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve a larger overall construction footprint, and may involve more subsurface construction than the proposed Project. While much of proposed additional housing would likely be on infill and redevelopment sites, additional housing could also occur in undeveloped areas. As a result, this alternative would have a greater potential to result in impacts to tribal cultural resources during construction compared to the proposed Project.

As discussed in Impact 7B.4-2 above, **Mitigation Measure 7B.4-2(a)** identified for this alternative requires that if a project is proposed within 100 feet of the location of a recorded archaeological site, at the discretion of the County Planning Office, further site-specific analysis shall be conducted to determine whether a significant impact would occur and to identify appropriate mitigation. The mitigation measure also requires archaeological monitoring for ground-disturbing activities (greater than 12 inches in depth) would take place in the immediate vicinity of known archaeological resources. Additionally, in the event that a previously unidentified prehistoric archaeological resource is discovered during construction, Mitigation Measure 7B.4-2(b) requires the contractor to cease work within 100 feet and contact the County Planning Office and University Archaeologist, and in the event that human skeletal remains are encountered, notify the County Coroner. Similar to mitigation identified for the proposed Project,

implementation of Mitigation Measure 7B.4-2 for this alternative would ensure potential impacts to tribal cultural resources would be reduced to a less-than-significant level.

Mitigation: Implement Mitigation Measure7B.4-2(a)-(b).

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7B.4-6: Additional Housing Alternative B development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources. (*Potentially Significant*)

The geographic scope for cumulative effects on historical resources includes unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and towns of Portola Valley and Woodside. Similar to the proposed Project, the potential impacts under this alternative when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on historic resources. A cumulatively considerable (significant) effect would occur if this alternative affected the same type of resource as one or more cumulative projects.

Similar to mitigation identified for the proposed Project, compliance with Mitigation Measure 7B.4-1(a)-(e) would require a protocol for the identification and protection of historic buildings and structures within the Project site and would generally reduce impacts to these types of resources as a category to the extent feasible. Similarly, cumulative projects located outside of the Project site that involve historic resources, would be subject to applicable regulations and environmental review requirements of those jurisdictions. While these regulations, processes, and conditions reduce impacts to historic resources both on the Stanford lands and in Santa Clara County as a whole, demolition of historic resources would not be prohibited; therefore, the cumulative impact for this alternative, similar to the proposed Project, would be significant and unavoidable.

Mitigation: Implement Mitigation Measure 7B.4-1(a)-(e).

Significance after Mitigation: Significant and Unavoidable.

Impact 7B.4-7: Ground-disturbing activities undertaken as part of the Additional Housing Alternative B could cumulatively cause a substantial adverse change in the significance of an archaeological resource, paleontological resource, or tribal cultural resource, or disturb human remains during construction. (*Potentially Significant*)

The geographic scope for cumulative effects on cultural and paleontological resources includes the unincorporated Santa Clara County, as well as the Stanford lands in unincorporated San Mateo County, the cities of Palo Alto and Menlo Park, and the towns of Portola Valley and

Woodside. The cumulative analysis combines archaeological resources, paleontological resources, tribal cultural resources, and human remains into a single, non-renewable resource base and considers the additive effect of potential project impacts to significant regional impacts on cultural resources. Similar to the proposed Project, the potential impacts under this alternative when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on cultural resources. A cumulatively considerable effect would occur if the Project affected the same type of resource as one or more cumulative projects. Impacts to archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries would be mitigated to a less-than-significant level with compliance with **Mitigation Measure 7B.4-2(a)-(b)** and **Mitigation Measure 7A.4-3**, which would require implementation of protocol to follow in the event of a discovery and the appropriate treatment of human remains as well as site-specific studies and monitoring in locations of previously recorded sites. Similarly, cumulative projects located outside of the Project site that involve archeological resources, tribal cultural resources, paleontological resources, and human remains interred outside of dedicated cemeteries, would be subject to applicable regulations and environmental review requirements of those jurisdictions. Therefore, similar to the proposed Project with implementation of Mitigation Measure 7B.4-2 and Mitigation Measure 7B.4-3, this alternative's contribution to cumulative impacts would not be considerable, and the impact would be less than significant.

Mitigation: Implement Mitigation Measure 7B.4-2(a)-(b) and Mitigation Measure 7B.4-3.

Significance after Mitigation: Less than Significant.

Energy Conservation[67]

Construction and Operational Impacts

Impact 7B.5-1: Additional Housing Alternative B development would not result in the use of fuel, water, or energy in wasteful or inefficient manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Additional Housing Alternative B would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in energy use compared to the proposed Project.

67 The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives energy analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-ENE included in this document.

Similar to the proposed Project, each of the six potential impact areas identified for Appendix F of the CEQA Guidelines are assessed for Additional Housing Alternative B with respect to energy use.

Appendix F.1: Energy Requirements and Energy Use Efficiencies of Additional Housing Alternative B

Similar to the proposed Project, energy consumption under Additional Housing Alternative B would be associated with electricity and natural gas use for operations, fuel consumption for mobile sources and emergency generator use, as well as energy consumption for construction activities. **Table 7B.5-1** presents the total energy demand in 2035 that would occur in the study area with implementation of Additional Housing Alternative B, and the net change in energy demand as compared to the 2018 environmental baseline.

TABLE 7B.5-1
NET CHANGE IN ENERGY CONSUMPTION UNDER PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE B

Energy Sector	Energy Demand in 2018 Baseline (MMBtu)	Total Energy Demand in 2035 with Proposed Project	Net Change in Energy Demand Project compared to 2018 Baseline (MMBtu)	Total Energy Demand in 2035 with Buildout of Additional Housing Alternative B (MMBtu)	Net Change in Energy Demand Additional Housing Alternative B compared to 2018 Baseline (MMBtu)
Electricity	1,095,088	1,355,768	+260,680	1,371,191	+276,103
Natural Gas	577,799	718,441	+140,642	732,841	+155,042
Mobile Gasoline Consumption	673,769	528,237	-145,532	576,515	-97,254
Mobile Diesel Consumption	63,490	22,687	-40,803	25,566	-37,924
Stationary Fuel Consumption	5,042	6,157	+1,115	6,157	+1,115
Construction Activities	5,240	5,240	0	8,135	+ 2,895
Total	**2,420,428**	**2,636,532**	**+216,104**	**2,720,403**	**+299,975**

NOTES:
MMBtu = million British Thermal Units

SOURCE: Ramboll, 2018 (see Appendix ALT-ENE)

As can be seen from Table 7B.5-1, due to additional development and growth under Additional Housing Alternative B, demand for electricity and natural gas under this alternative would increase as compared to the 2018 baseline. Table 7B.5-1 also shows that demand for gasoline and diesel would decrease under Additional Housing Alternative B as compared to the 2018 baseline. Similar to the proposed Project, this is due to implementation of Stanford's alternative transportation programs, TDM program, and electric vehicle initiatives that would occur under this alternative; as well as from reasonable assumptions about increasing fuel efficiency of vehicles based on established State and federal regulatory standards.

Overall energy demand in 2035 with buildout of Additional Housing Alternative B is projected to increase approximately 12 percent over the 2018 baseline, although fuel consumption would be reduced as a result of the electrification of bus fleets. Energy demand in 2035 with buildout of Additional Housing Alternative B would also be approximately 3 percent greater than Project conditions in 2035 due to the additional energy and fuel demand generated by the additional on-campus residential units.

However, as shown in **Table 7B.5-2**, the per capita energy demand under Additional Housing Alternative B would decrease, indicative of an overall improvement in energy efficiency compared to baseline conditions. Additional Housing Alternative B would also have a slightly lower per capita energy demand (37.8 MMBtu/service population) than the per capita energy demand of the proposed Project (38.3 MMBtu/service population) that results from the additional population serviced occupying the additional on-campus residential units. Similar to the proposed Project, the decrease in per capita energy demand under Additional Housing Alternative B compared to 2018 baseline conditions demonstrates that energy use efficiencies would increase under Additional Housing Alternative B, and resulting energy use from implementation would not be wasteful or inefficient.

TABLE 7A.5-2
NET CHANGE IN PER CAPITA ENERGY CONSUMPTION UNDER PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE B

Inventory Year	MMBtu Equivalents	Service Population	MMBtu/ Service Population
2018 Baseline	2,420,428	53,268	45.4
2035 with Buildout of Proposed Project	2,636,532	68,781	38.3
2035 with Buildout of Additional Housing Alternative B	2,720,403	71,930	37.8

NOTES:
MMBtu = million British Thermal Units

SOURCE: Ramboll, 2018 (see Appendix ALT-ENE)

Appendix F.2: The Effects of Additional Housing Alternative B on Local and Regional Energy Supplies and on Requirements for Additional Capacity

Similar to the proposed Project, use of the local and regional energy supply under Additional Housing Alternative B would be efficient as a result of use of renewable energy, energy efficiency standards, and the continued operation of the Stanford's CEF and implementation of the SESI program. Additionally, as under the proposed Project, while Stanford's proposed electrification of all Marguerite buses and 70 percent of its LBRE and Bonair vehicle fleets by 2035 would result in a small increase in calculated total electricity usage, the incremental electricity increase under this alternative would be more than offset by the associated decrease in diesel fuel consumption as shown in Table 7B.5-1. In addition, continued operation of the Stanford Solar Generating Station in Kern County and on-campus rooftop solar panels would provide campus electricity by renewable sources.

Over 98 percent of Stanford's electrical demand that is not met by the Solar Generating Station and on-campus rooftop solar panels is provided by a direct access provider which Stanford

would, similar to the proposed Project, have the discretion to change throughout implementation of Additional Housing Alternative B. Electrical service providers including PG&E actively plan for anticipated increases in peak demand and actively plan to offset growth in peak demands by encouraging and deploying energy efficiency and conservation measures within their service area. Given that there are approximately 6,000 megawatts of pending power plant projects is the state, similar to the proposed Project, Additional Housing Alternative B's increase in electrical demand would not have a substantial impact on the local or regional electrical supplies or require additional capacity to be constructed.

As shown in Table 7B.5-1, under Additional Housing Alternative B, the annual natural gas consumption in the study area in 2035 is estimated to increase by approximately 155,042 MMBtu over the 2018 baseline (and an increase of 14,400 MMBtu over the proposed Project). However, it is projected that natural gas demand in California will decrease in 2030 to 2.23 trillion Btu/yr. Ninety percent of the State's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins. The United States produces 20 trillion cubic feet per year and had 340 trillion cubic feet of proven reserves in 2014. Similar to the proposed Project, Stanford's natural gas consumption under Additional Housing Alternative B would not be substantial in comparison to the national natural gas reserves and would comprise only 0.003 percent of annual national natural gas production. Consequently, given the ample regional natural gas supplies available, Additional Housing Alternative B, similar to the proposed Project, would not have a significant impact on local or regional natural gas supply or require additional capacity to be constructed.

Gasoline and diesel are provided by California's transportation fuel supplier network. As shown in Table 7B.2-1, implementation of Additional Housing Alternative A would result in a reduction of gasoline and diesel demand compared to the 2018 baseline. The total net reduction in fuel use under Additional Housing Alternative B (-134,063 MMBtu) would be less than that under the proposed Project (-185,219 MMBtu), however, due largely to a greater mobile gasoline use under this alternative. Regardless, similar to the proposed Project, Additional Housing Alternative B would not adversely affect local or regional supply of these fuels. As under the proposed Project, overall, Additional Housing Alternative B would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Appendix F.3: The Effects of Additional Housing Alternative B on Peak and Base Period Demands for Electricity and Other Forms of Energy

Stanford's SESI program was designed to increase its energy efficiency and allow the CEF to meet both peak and base demand for heating and cooling. Specific features of the new CEF allow for renewable or sustainable options for meeting peak demand. Stanford's procurement of substantial amounts of renewable energy, including the new 73 MW off-site Kern County solar plant and the 4.9 MW of on-site rooftop solar panels, would help meet peak electricity demands on campus. Specifically, the off-site solar plant would meet Stanford's peak electricity demand of 42 MW. This generation of new renewable energy would reduce the strain on electricity production by reducing the demand for the grid resources, particularly during peak times when energy demand is the highest. Although Additional Housing Alternative B would increase electricity demand compared to the proposed Project, based on the availability of these resources, as with the proposed Project, Additional Housing Alternative B effects on peak and base period

demands for electricity would not result in wasteful or inefficient use of energy, or require additional capacity to be constructed.

Appendix F.4: The Degree to which Additional Housing Alternative B Complies with Existing Energy Standards

As under the proposed Project, during implementation of Additional Housing Alternative B, Stanford would be required to adhere to applicable federal and State standards designed to minimize use of fuel in construction vehicles and ensure that buildings employ required energy efficiency techniques.

Stanford new building construction is subject to California's Title 24, which reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6). Provisions added over the years include consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, and lighting, as well as construction waste diversion goals. Additionally, some standards focus on larger energy saving concepts such as reducing loads at peak periods and seasons, improving the quality of energy-saving installations, and performing energy system inspections. Development projects under the 2000 General Use Permit have often exceeded Title 24 requirements in construction and operation of new buildings.

With respect to transportation energy, existing energy standards are promulgated either through the regulation of fuel refineries and products, such as the low carbon fuel standard, or through light-duty vehicle greenhouse gas emissions standards and corporate average fuel economy standards established by USEPA. Further, construction projects at Stanford would comply with State requirements designed to minimize idling and associated emissions, which also minimizes use of fuel.

Appendix F.5: The Effects of Additional Housing Alternative B on Energy Resources

See the discussion above under Appendix F.2: The Effects of the Project on Local and Regional Energy Supplies and on Requirements for Additional Capacity.

Appendix F.6: The Projected Transportation Energy Use Requirements and Overall Use of Efficient Transportation Alternatives under Additional Housing Alternative B

As described further in the analysis of VMT presented in Transportation and Traffic, the per resident and per worker VMT generation under Additional Housing Alternative B, although higher than the proposed Project, would be substantially lower than the regional and countywide averages. The VMT rates would be supported by Stanford's TDM program and the ability for residents to commute to work or class without using personal vehicles due to the density of public transit near and on the campus. In addition, on-campus housing for faculty and students would lower commuting VMT. Lower VMT results in lower mobile fuel use per worker and per resident than the regionwide and countywide average.

Stanford's existing alternative transportation programs have resulted in the percentage of sustainable commuters (commuters traveling in modes other than single occupancy vehicles) at

Stanford to increase from 31 percent in 2002 to 51 percent in 2016. The use of transit passes, bicycling, rideshares, and other alternative modes of transportation, demonstrate the efficient use of transportation systems at Stanford.

Although Additional Housing Alternative B's total VMT and consumption of mobile fuels is higher than the proposed Project's, Stanford's TDM measures and commute options that are currently in-place, including, but not limited to, Marguerite shuttle system, use of transit subsidies, Stanford's Commute Club and use of electric vehicles represent efficient transportation alternatives that would be utilized under Additional Housing Alternative B, similar to the proposed Project.

Conclusion

Overall energy demand in 2035 with buildout of Additional Housing Alternative B is projected to increase approximately 12 percent over the 2018 baseline (and approximately 3 percent greater than Project conditions in 2035). Electricity and natural gas demands would be higher than the proposed Project's, while the decrease in mobile fuels demand would be lesser than under the proposed Project. As shown in Table 7A.5-2, similar to the proposed Project, the per capita energy demand under Additional Housing Alternative B would decrease, indicative of an overall improvement in energy efficiency compared to baseline conditions. As under the proposed Project, the decrease in per capita energy demand under Additional Housing Alternative B demonstrates that energy use efficiencies would increase under this alternative, and resulting energy use from implementation of the alternative would not be wasteful or inefficient. Further, similar to the proposed Project, Additional Housing Alternative B would not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

Similar to the proposed Project, based on an evaluation of issues identified in CEQA Appendix F, Additional Housing Alternative B would not result in wasteful or inefficient consumption of fuel or energy, and would not create demand on local and regional energy supplies that would require additional energy generation or transmission capacity. This impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7B.5-2: Additional Housing Alternative B development, in conjunction with other cumulative development and growth, would not contribute to cumulative increases in demand for energy which would result in the use of large amounts of fuel, water, or energy, or use these in wasteful manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect. (*Less than Significant*)

Electricity

Stanford is procuring the vast majority of electricity from Calpine through the direct access program. Calpine is one of many direct access electricity providers in the state and Stanford has the discretion to change providers over the implementation of the 2018 General Use Permit or Additional Housing Alternative B.

Continued growth throughout California's service areas could contribute to ongoing increases in demand for electricity. These anticipated increases would be countered, in part, by ongoing increases in national, statewide, and local requirements and incentives to support construction or retrofit of buildings with increased energy efficiency. Overall state-wide electricity supply during most conditions is adequate to meet demand. However, as demand continues to increase, temporary shortfalls could occur on portions of the statewide grid during temporary periods of high peak demand. Electricity providers such as Calpine and PG&E are actively planning for anticipated increases in peak demand through 2050. Given that California ranked first in electricity production from both solar and geothermal energy, and that there are approximately 6,000 megawatts of pending power plant projects is the state, similar to the proposed Project, development under Additional Housing Alternative B would not constitute a cumulatively considerable impact on the primary regional electricity distributors or sources.

Natural Gas

With respect to natural gas, PG&E sources natural gas from a combination of producers and suppliers located in Canada and the U.S. Southwest. The utility maintains contracts with producers and suppliers over daily, monthly, and longer term agreements. PG&E also maintains gas storage facilities and a network of conveyance and distribution pipelines within its service area. In order to address future increases in demand, PG&E maintains an active planning process to identify and deploy additional conservation measures to minimize increases in demand, to secure continued natural gas supply, and to maintain sufficient distribution system capacity within its service area. The latest California Gas Report indicates that predicted demand for Northern California during a high demand wintertime scenario in 2035 of 2,463 MMCF per day will be 79 percent of available capacity. Similar to the proposed Project, existing and planned infrastructure is anticipated to be sufficient to maintain service to Additional Housing Alternative B and other cumulative scenario projects. Therefore, cumulative scenario impact on natural gas supply would not be cumulatively considerable.

Transportation Fuel

The cumulative context of transportation fuels involves both construction activities, which is predominantly a demand for diesel fuel; as well as operational demand, which is predominantly a demand for gasoline. Base gasoline demand dropped by about 13 percent between 2003 and 2013 and base diesel fuel demand remain unchanged between 2003 and 2013. Future statewide increases in gasoline demand associated with growth will likely continue to be offset by improvements to the vehicle fleet and programs such as low carbon fuel standard. As shown in Table 7B.5-1, implementation of Additional Housing Alternative B, similar to the proposed Project, would result in a net decrease in gasoline and diesel demand. Consequently, as under the proposed Project, Additional Housing Alternative B would not have a cumulatively considerable contribution to the demand for transportation fuels.

Mitigation: None required.

Geology and Soils

Construction Impacts

Impact 7B.6-1: Additional Housing Alternative B construction would not result in substantial soil erosion or loss of topsoil. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative could result in correspondingly greater disturbance of soils formerly protected with vegetation or covered by asphalt or concrete that could be exposed to winds and water flows that result in soil erosion or the loss of topsoil.

As under the Project, individual projects developed under this alternative would be required to implement construction best management practices (BMPs), as detailed in the Storm Water Pollution Prevention Plan (SWPPP) as required by the Construction General Permit from the National Pollution Discharge Elimination System (NPDES) program, which provide a benefit of preventing soil erosion and loss of topsoil at construction sites. Thus, with adherence to the required BMPs, potential construction-related erosion effects would be minimized.

As under the Project, following completion of construction activities for individual projects under this alternative, disturbed areas would be either revegetated through landscaping or covered by impervious surfaces such as structures or asphalt which limits the potential for erosion. Thus, construction activities that would occur under the alternative would result in less-than-significant soil erosion impacts.

Mitigation: None required.

Operational Impacts

Impact 7B.6-2: Additional Housing Alternative B development would not expose people or structures to substantial adverse effects from ground shaking. (*Less than Significant*)

Additional Housing Alternative B would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more people and structures on the campus to potential effects of earthquake groundshaking. As with the proposed Project, as part of the County's approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all requirements of the California Building Code (CBC), the County Geologist, the County Building Inspection Office, the Stock Farm Monocline Agreement, and any other agreements defined during the term of the use permit under this alternative with regard to reduction of seismic risk. Similar to the proposed Project, site-specific geotechnical investigations for each project developed under this alternative, as required by the CBC, County and Stanford would be prepared for, and reviewed and approved by, the County Planning and

Development Department prior to issuance of a building permit, ensuring that seismic design requirements are incorporated into construction specifications. As under the proposed Project, compliance with the building safety design standards of the CBC, the County and Stanford would reduce potential impacts associated with ground shaking in projects developed under this alternative to a less-than-significant level.

Mitigation: None required.

Impact 7B.6-3: Additional Housing Alternative B development would not expose people or structures to potential substantial adverse effects associated with liquefaction or lateral spreading, including the risk of loss, injury or death, in the event of a major earthquake on one of the regional active faults. (*Less than Significant)*

Additional Housing Alternative B would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more residential population and structures on the campus to potential effects of liquefaction or lateral spreading in the event of a major earthquake. Under this alternative, additional housing would be developed in certain development districts - West Campus, DAPER and Administrative and Quarry Development Districts – contain areas identified as being moderately susceptible to liquefaction; the East Campus Development District is identified as having a low susceptibility to liquefaction. Similar to the proposed Project, adherence to building code requirements using geotechnical design measures outlined in the final design level geotechnical report prepared for individual projects under this alternative, and approved by the County, would minimize the potential for effects related to liquefaction and lateral spreading. As with the proposed Project, implementation of these building code requirements and geotechnical measures for individual projects developed under this alternative would ensure that seismically-induced ground failure, including liquefaction and lateral spreading, would be a less than significant impact.

Mitigation: None required.

Impact 7B.6-4: Additional Housing Alternative B development would not expose people or structures to potential substantial adverse effects associated with landslides, including the risk of loss, injury or death, in the event of a major earthquake on one of the other regional active faults. (*Less than Significant*)

Additional Housing Alternative B would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would expose more residential population and structures on the campus to potential effects of landslides in the event of a major earthquake. However, additional on-campus housing that would be developed under this alternative would not be located in areas of the Project site identified by CGS as being highly susceptible to seismically induced landslides; or susceptible to slope instability. In any case, similar to the proposed Project, compliance of individual projects

under this alternative with applicable building safety design standards would reduce potential impacts associated with seismically induced landslides to a less-than-significant level.

Mitigation: None required.

Impact 7B.6-5: Additional Housing Alternative B development would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in correspondingly greater disturbance of soils and/or the loss of topsoil than the proposed Project. As discussed in Impact 7B.6-1, above, similar to the proposed Project, with implementation of construction BMPs included in the SWPPP as required by the Construction General Permit from the NPDES program, potential construction-related erosion effects associated with new development under this alternative would be minimized. As with the proposed Project, following construction, each project that would be developed under this alternative would be required to implement post-construction BMPs that include erosion control measures. Thus, as with the proposed Project, operation of the new development under this alternative would not result in substantial soil erosion or the loss of topsoil, and impacts would be less than significant.

Mitigation: None required.

Impact 7B.6-6: Additional Housing Alternative B development would not result in substantial adverse effects from on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse as a result of being located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project development. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than would occur under the proposed 2018 General Use Permit. As a result, this alternative would have a greater potential than the proposed Project to be subject to effects from new development being located on an unstable geologic units or soils. As discussed in Impact 7A.6-3, above, certain development districts the proposed additional housing would be developed in - West Campus, DAPER and Administrative and Quarry Development Districts – contain areas identified as being moderately susceptible to liquefaction. However, as discussed in Impact 7A.6-4 above, none of the development districts in which additional on-campus housing would be developed are identified by CGS as being highly susceptible to seismically induced landslides; or susceptible to slope instability. As with the proposed Project, under this alternative, the potential for unstable soils to be present at the Project site would depend on site specific conditions and the scope of proposed improvements which would be evaluated as part of the required geotechnical investigations for individual projects. Site preparation measures would be

recommended in a geotechnical report and incorporated into site design in accordance with building code requirements, and approved by the County. Therefore, similar to the proposed Project, with adherence to building code requirements, the potential for unstable soils to adversely affect new development under this alternative would be reduced to a less-than-significant level.

Mitigation: None required.

Impact 7B.6-7: Development under the Additional Housing Alternative B would not be located on expansive soils that would create substantial risks to life or property. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than would occur under the proposed 2018 General Use Permit. As a result, this alternative would have a greater potential than the proposed Project to for new development to be located on expansive soils. As under the proposed Project, as a requirement of the CBC, any development under this alternative would be required to complete a final geotechnical investigation that includes site-specific recommendations for the mitigation of potentially expansive soils. As under the proposed Project, geotechnical investigation and analysis of underlying soils would inform the recommended structural design of individual building projects under this alternative. Therefore, similar to the proposed Project, implementation of standard geotechnical engineering practices and adherence to building code requirements under this alternative would identify and reduce potential impacts from expansive soils on new development to a less-than-significant level.

Mitigation: None required.

Cumulative Impacts

Impact 7B.6-8: Development facilitated by the Additional Housing Alternative B, combined with past, present, and reasonably foreseeable probable projects, would not result in substantial adverse cumulative impacts to geology, soils, or seismic hazards. (*Less than Significant*)

The geographic scope of potential geology and soils impacts is restricted to the Project site and immediate vicinity because related risks are relatively localized or even site-specific. Accordingly, potential seismic related hazards, including groundshaking and earthquake-induced liquefaction and landslides, would not be considered cumulative in nature. Similarly, other potential geologic hazards such as unstable soils, expansive soils, and slope stability would also be localized or site-specific, and as a result, would not be cumulative in nature.

As under the proposed 2018 General Use Permit, for individual projects under Additional Housing Alternative B, construction activities at the Project site, similar to other cumulative development greater than one acre in size, would be required to comply with the NPDES Construction General Permit, which contain erosion control requirements that would minimize

the potential for erosion. The NPDES program requires the preparation and implementation of SWPPPs for construction activities that include BMPs that ensure erosion control measures are included during construction. The individual projects under this alternative would be required to comply with these regulations, as would other cumulative development. Similarly, individual projects under this alternative would be required to implement post-construction BMPs that include erosion control measures, as would other cumulative development. Therefore, similar to the proposed Project, this alternative, in conjunction with other nearby cumulative development would not have a cumulatively significant impact associated with erosion.

Mitigation: None required.

Greenhouse Gas Emissions[68]

Impact 7B.7-1: Additional Housing Alternative B would not generate greenhouse gas emissions, either directly or indirectly, that would have a cumulatively considerable contribution to global climate change. (*Less than Significant*)

Additional Housing Alternative B would involve more on-site development, a larger on-campus residential population and associated changes in traffic, and more on-site construction, than the proposed Project, which would result in a net increase in greenhouse gas emissions compared to the proposed Project.

Similar to the GHG Impact analysis conducted for the proposed Project, an evaluation was conducted of the emissions inventory for the complete buildout of the development allowed in the study area under Additional Housing Alternative B. GHG operational emissions include electricity use, natural gas use, mobile sources, emergency generator use, solid waste, and water supply and wastewater; as well as GHG emissions from construction activities.

The total estimated GHG emissions in 2035 in the study area with buildout of Additional Housing Alternative B are presented in **Table 7B.7-1**, below. Development and growth under Additional Housing Alternative B would emit total GHG emissions of approximately 131,472 $MTCO_2e$ per year in 2035 (6,060 $MTCO_2e$ per year more than the proposed Project in 2035). The dominant GHG emissions sources would be almost evenly distributed between transportation, electricity imported to campus, and natural gas which contribute 36 percent, 29 percent, and 30 percent of the total inventory, respectively. This GHG emission rate is an approximate 5 percent increase over both the 2018 baseline emissions as well as the emissions under the proposed Project.

[68] The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing GHG emissions analysis prepared by Ramboll for Stanford and independently peer reviewed by ESA; see Appendix ALT-GHG included in this document.

TABLE 7B.7-1
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE B

GHG Source	GHG Emissions under the Proposed Project (metric tons CO2e per year)	GHG Emissions under Additional Housing Alternative B (metric tons CO2e per year)
Electricity		
PG&E Commercial	27	27
PG&E Searsville/Olmstead	37	37
New Faculty/Staff Housing	279	874
Direct Access	454	454
Imported to Campus and CEF	35,628	35,653
Non-Stanford Commercial	419	419
Subtotal	**36,844**	**37,463**
Natural Gas		
PG&E Residential	4,281	4,307
PG&E Commercial	20,559	20,559
PG&E Searsville/Olmstead	71	71
New Faculty/Staff Housing	347	1,085
Hot Water Generators	7,104	7,104
Replacement Process Steam Plant	5,770	5,770
Subtotal	**38,131**	**38,895**
Mobile Sources		
Worker Trips	15,524	15,013
Resident Trips	14,222	18,526
Campus Vehicles On-road	1,170	1,170
Campus Vehicles Off-road	235	235
Other Trips	11,767	11,830
Subtotal	**42,919**	**46,776**
Emergency Generators		
Subtotal	**444**	**444**
Solid Waste		
Subtotal	**5,286**	**5,716**
Water Transport and Treatment		
Domestic Water Use	320	367
Wastewater Treatment	121	139
Direct Wastewater Emissions	633	726
Subtotal	**1,074**	**1,231**
Miscellaneous Sources		
On-Campus Research and Fire Suppression	294	294
Construction Equipment	420	652
Subtotal	**714**	**946**

TABLE 7B.7-1 (CONTINUED)
TOTAL GHG EMISSIONS IN 2035 WITH BUILDOUT OF PROPOSED PROJECT AND ADDITIONAL HOUSING ALTERNATIVE B

GHG Source	GHG Emissions under the Proposed Project (metric tons CO2e per year)	GHG Emissions under Additional Housing Alternative B (metric tons CO2e per year)
Total GHG Emissions 2035 with Buildout of Additional Housing Alternative B	**125,412**	**131,472**
Service Population	**68,781**	**71,930**
Emissions per Service Population	**1.8**	**1.8**
2030 Service Population Threshold	**2.7**	**2.7**
Exceeds 2030 Threshold?	**No**	**No**
2035 Service Population Threshold based on progress to 2050	**2.1**	**2.1**
Exceeds 2035 Threshold?		**No**

NOTES: The service population, comprised 49,479 workers, 25,599 residents and 19,668 workers who are residents, as derived from population estimates the SB 743 VMT Analysis prepared by Stanford for project alternatives.

SOURCE: Ramboll, 2018 (see Appendix ALT-GHG)

As with the 2035 inventory used for the proposed Project, the 2035 inventory for Additional Housing Alternative B was conservatively developed using 2030 emission factors. As a result, the electricity intensity factor, mobile emission factors, and other GHG sources are expected to continue to decrease after 2030 to meet California's long-term GHG reduction goals.

Additional Housing Alternative B would result in emissions of 1.8 MT of CO_2e per service population, similar to the proposed Project. This is below the 2.7 MT of CO_2e per service population threshold to determine consistency with the reduction goals established under SB 32 and EO B-30-15 for year 2030. The emissions of 1.8 MT of CO_2e per service population under Additional Housing Alternative B would also be below the 2.1 MT of CO_2e per service population threshold significance criterion developed for determining the GHG reduction trajectory toward 2050.

While the total GHG emissions under Additional Housing Alternative B would be 5 percent above the GHG emissions under the 2018 baseline (and Project) conditions, GHG emissions under Additional Housing Alternative B, similar to the proposed Project, would be below the significance thresholds that relate to consistency with GHG reduction goals for year 2030 and, to the extent feasible, year 2050. Similar to the proposed Project, Additional Housing Alternative B would not generate GHG emissions, either directly or indirectly, that would make a cumulatively considerable contribution to a significant impact on global climate change. Thus, this impact is less than significant.

Mitigation: None required.

Impact 7B.7-2: Additional Housing Alternative B could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*Significant*)

The consistency of Stanford's operations with respect to state and local GHG reduction plans under the proposed 2018 General Use Permit was assessed in Section 5.7 of the Draft EIR. Plans, executive orders and regulations considered in this evaluation included:

- Assembly Bill 32 (AB32)
- The AB 32 Scoping Plan
- Plan Bay Area
- Executive Order B-30-15
- Senate Bill 32
- Executive Order No. S-3-05
- The 2017 Clean Air Plan
- Health Element of the County of Santa Clara General Plan

Additional Housing Alternative B's consistency with these plans, policies, and executive orders would essentially be the same as under the proposed Project, as discussed below.

Assembly Bill 32

The primary goal of AB 32 is the requirement for statewide GHG emissions to be reduced to 1990 levels by 2020. BAAQMD developed an efficiency metric of 4.6 MT of CO_2e per service population or less as indicative of a proposed plan or mixed use development as sufficient for achieving the year 2020 of AB32 (BAAQMD, 2009). As indicated in Table 7B.7-1, similar to the proposed Project, emissions under Additional Housing Alternative B would be well below this efficiency metric. Thus, as under the proposed Project, Additional Housing Alternative B would not conflict with the primary goal of AB 32.

CARB Scoping Plan

The AB 32 Scoping Plan identifies over 70 measures for reducing greenhouse gas emissions to 1990 levels by 2020. Specific measures discussed in the Scoping Plan that are relevant to the proposed Project include the Renewables Portfolio Standard (RPS) and Advanced Clean Cars program.

As discussed in the Environmental Setting of Section 5.7 in the Draft EIR, notable recent changes to Stanford's energy systems have occurred in combination with the renewable sources that utilities must use to comply California's Renewables Portfolio Standard (RPS), resulting in the anticipated total percentage of Stanford's electricity from renewable sources would be over 65 percent under Additional Housing Alternative B in 2035, similar to the proposed Project.

Vehicle GHG emission limits required by regulation combined with low carbon fuel standards will reduce the campus's vehicular GHG emissions on a per service population basis. As under

the proposed Project, additional emissions reductions would result from Stanford's proposed electrification of all its Marguerite, LBRE and Bonair vehicle fleets by 2035 under Additional Housing Alternative B. Consequently, similar to the proposed Project, through its past and ongoing proactive actions, and with implementation of Additional Housing Alternative B, Stanford would be consistent with elements of the Scoping Plan relevant to its operations.

Plan Bay Area

MTC estimates increases in both residents and workers at Stanford in its 2040 growth projections under Plan Bay Area. Similar to the proposed Project, Additional Housing Alternative B is consistent with the SCS in terms of proposing additional residences and academic square footage in locations specified in the SCS for such development. In addition, the VMT analysis presented in Transportation and Traffic indicates that Additional Housing Alternative B would generate VMT per worker and VMT per capita rates that are below the regional averages, similar to the proposed Project.

As under the proposed Project, because Additional Housing Alternative B would locate residents and workers where envisioned by the SCS, and would generate less VMT per capita and VMT per worker compared to the existing regional averages, it would not conflict with the regional goals and targets expressed in the *Plan Bay Area Sustainable Communities Strategy*.

Executive Order B-30-15 and SB 32

Executive Order B-30-15 established a GHG emission reduction goal for California of 40 percent below 1990 levels by 2030. The GHG emissions total presented in Table 7B.7-1 conservatively represents the emissions inventory for Additional Housing Alternative B at full build-out in 2035. As explained in the preceding impact analysis, similar to the proposed Project, the emissions under Additional Housing Alternative B would be below the 2030 service population target calculated based on the GHG reduction goal established under SB 32 and EO B-30-15 (40 percent reduction below 1990 levels by 2030, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Similar to the proposed Project, Additional Housing Alternative B would not conflict with SB 32 (or with the 2017 Scoping Plan that implements SB 32) and EO B-30-15, and Stanford's GHG emissions under Additional Housing Alternative B would be below the efficiency metric threshold derived for year 2030 reduction goals.

Executive Order S-3-05

Executive Order No. S-3-05 established a goal of reducing the State's GHG emissions to 80 percent below the 1990 level by the year 2050. Similar to the proposed Project, GHG emissions under Additional Housing Alternative B would be lower than the service population target calculated for 2035 based on the trajectory needed to achieve the GHG reduction goal established under EO S-3-05 (80 percent reduction below 1990 levels by 2050, taking into account the 1990 emissions levels and the projected 2030 statewide population and employment levels). Therefore, as under the proposed Project, Additional Housing Alternative B would not conflict with the attainment of the State's long-term GHG reduction goal for 2050.

BAAQMD 2017 Clean Air Plan

The 2017 Clean Air Plan contains transportation measures and measures related energy, green building, waste management, water control of short-lived GHGs. Those Clean Air Plan measures applicable to the Project are identified in **Table 5.2-11** in Section 5.2, Air Quality of the Draft EIR. Table 5.2-11 provides a brief description of the control measure and identifies any existing or proposed mechanism that Stanford and surrounding local jurisdictions and transit agencies would have in place to implement these measures. All existing mechanisms or those included in the proposed 2018 General Use Permit would also be part of Additional Housing Alternative B and, therefore, would be consistent with most, but not all, of the relevant control measures of the 2017 Clean Air Plan. Because there are some control measures with which the Project as proposed may not be consistent, this impact is also considered significant under Additional Housing Alternative B. Where an implementation mechanism does not currently exist or is not identified in Additional Housing Alternative B, mitigation measures are identified below to ensure its consistency with the 2017 Clean Air Plan.

County of Santa Clara General Plan

In 2015, the County of Santa Clara adopted a new Health Element of the General Plan. The Health Element contains five policies that may be interpreted to address climate change and GHG emissions. The first of these is Policy HE-G.5, which directs the County to support efforts to reduce transportation-related GHG emissions. Like the proposed Project, Additional Housing Alternative B addresses this policy by Stanford's continued implementation of its TDM programs which are designed to achieve the Stanford Community Plan's No Net New Commute Trips standard.

Policy HE-G.10 directs the County to promote energy conservation and efficiency in homes, businesses, schools, and other infrastructure to reduce energy use and criteria pollutant and greenhouse gas emissions, and Policy HE-G.17 directs the County to promote energy retrofits and increase extreme heat resiliency for housing. Similar to the proposed Project, development under Additional Housing Alternative B would address these policies through implementation of Stanford's Climate and Energy Plan, which sets forth high-performance, whole-building energy performance targets specifically for each new building. As under the proposed Project, these requirements would ensure that development under Additional Housing Alternative B would be consistent with Policies HE-G.10 and HE-G-17.

Policy HE-G.11 directs the County to encourage renewable energy, such as solar and wind turbines on commercial, industrial and residential buildings. Similar to the proposed Project, under Additional Housing Alternative B, Stanford's updated campus-wide energy system, and heat recovery systems would provide renewable energy in addition to procuring electricity from its Solar Generating Station in Kern County as well as generating additional electricity from its on-campus rooftop solar installations, providing part of the campus's electricity demand. Therefore, as under the proposed Project, development under Additional Housing Alternative B would be powered and heated via these renewable energy sources, and hence would implement the intent of Policy HE-5.11.

Policy HE-G.16 directs the County to implement heat island mitigation by supporting urban greening and the use of green infrastructure to minimize the urban heat island effect. Stanford's Guidelines for Sustainable Buildings includes strategies for using microclimate and

environmentally responsive design which include designing sites to reduce "heat island" effects, as discussed in the Draft EIR. Similar to the proposed Project, implementation of these strategies would make Additional Housing Alternative B consistent with Policy HE-G.16.

Mitigation: Implement the following mitigation measures:

Mitigation Measure 7B.15-2(a): *Mitigation either through a program of "no net new commute trips" or through the contribution of fair share fees for the cost of improvements to fund transportation mitigation efforts.*

Mitigation Measures 7B.3-8(a)-(b): *Mitigation for native oak woodland.*

Mitigation Measure 7B.3-9(a)-(c): *Mitigation for wetlands.*

Mitigation Measure 7B.3-11(a)-(c): *Mitigation for protected trees*.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Climate change is the cumulative effect of all natural and anthropogenic sources of GHGs accumulated on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change, and thus the assessment of GHG emissions impacts is inherently a cumulative analysis.

The analysis in Impact 7B.7-1 uses the BAAQMD CEQA Guidelines service population metric to assess the significance of the contribution to cumulative global GHG emissions under Additional Housing Alternative B. Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to particular global climate changes.

Both BAAQMD and the California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate. Therefore, the evaluation of cumulative GHG impacts presented above evaluates whether Additional Housing Alternative B would make a considerable contribution to cumulative climate change effects. This is the same finding as under the proposed Project.

Hazards and Hazardous Materials

Construction Impacts

Impact 7B.8-1: Under Additional Housing Alternative B, demolition of existing structures that contain hazardous building materials would not create a significant hazard associated with exposure of workers, the public, or the environment from the transport, use, or disposal of these hazardous materials and waste. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. As a result, this alternative would result in more demolition and/or and modifications of existing improvements and structures on the Project site than under the proposed Project, and correspondingly, greater potential exposure of construction workers, the public, or the environment to hazardous materials such as lead-based paint (LBP), asbestos containing materials (ACMs), mercury and polychlorinated biphenyls (PCBs). However, as under the proposed Project, potential exposure to these hazardous building materials under this alternative would be eliminated or reduced to legally acceptable levels through compliance with abatement measures required as part of applicable federal, State and local regulations implemented through Stanford's Department of Environmental Health and Safety (EH&S) programs and overseen by County of Santa Clara Hazardous Materials Compliance Division (HMCD). Therefore, similar to the proposed Project, this impact for this alternative would be less than significant.

Mitigation: None required.

Impact 7B.8-2: Under Additional Housing Alternative B, construction projects could disturb soil and groundwater contaminated by historical hazardous material use, which could present risks the health of construction workers, the public, and/or the environment. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in overall greater soil disturbance on the Project site during construction compared to the proposed Project, and thus, would have a corresponding greater overall potential to disturb groundwater. Under this alternative, as under the proposed Project, if potential disturbance occurs in areas previously contaminated by hazardous materials, construction workers, the public, and/or the environment may be exposed to a localized release of compounds considered hazardous to human health or the environment, which would be a significant impact. However, implementation of **Mitigation Measure 7B.8-2(a)-(c)** identified for this alternative, which is the same as that identified for the proposed Project, establishes protocols for construction activities that would reduce or eliminate the potential risks to public or construction worker health, or the environment, reducing this impact to a less than significant level.

Mitigation Measure 7B.8-2(a): During construction within the Project site, any contractor shall cease any earthwork activities upon discovery of any suspect soils or groundwater (e.g., petroleum odor and/or discoloration) during construction. The contractor shall notify Stanford's Department of Environmental Health and Safety (EH&S) and the County of Santa Clara's Hazardous Materials Compliance Division (HMCD) of the Department of Environmental Health upon discovery of suspect soils or groundwater. EH&S will retain a qualified environmental firm to collect soil samples to confirm the level of contamination that may be present.

Mitigation Measure 7B.8-2(b): If contamination is found to be present, any further proposed soil- or groundwater-disturbing activities within areas of identified or suspected contamination shall be conducted according to a site specific health and safety plan, prepared by a California state licensed professional. The contractor shall follow all procedural direction given by County HMCD and/or identified in a Soil and Groundwater Management Plan prepared for the site by a qualified environmental firm to ensure that suspect soils are isolated, protected from runoff, and disposed of in accordance with transportation laws and the requirements of the licensed receiving facility (in coordination with EH&S).

Mitigation Measure 7B.8-2(c): If contaminated soil or groundwater is encountered and identified constituents exceed human health risk levels, it shall be delineated, removed, and disposed of offsite in compliance with the overseeing agency, either County HMCD or Regional Water Quality Control Board (RWQCB), as well as the receiving facilities' requirements.

Significance after Mitigation: Less than Significant.

Impact 7B.8-3: Improper handling or storage of hazardous materials during Additional Housing Alternative B construction activities could result in spills would not significantly increase public health and/or safety risks to future residents, maintenance workers, visitors, and the public and environment in the area surrounding the spill. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. As a result, this alternative would use more of certain hazardous materials such as fuels, oils, solvents, and glues during construction than the proposed Project, the inadvertent release of which could adversely impact workers, the public, soil, surface waters, or groundwater quality. Similar to the proposed Project, the use of construction best management practices implemented as part of a SWPPP as required by the NPDES General Construction Permit under this alternative would minimize the potential adverse effects to workers, the public, surface waters, groundwater and soils. Similar to the proposed Project, given the protective measures required to comply with federal, State, and local laws and regulations (i.e., best management practices) and the quantities of hazardous materials typically needed for construction projects, the potential exposure of construction workers or the public, or contamination of soil and/or groundwater, from construction-related hazardous materials under this alternative would be considered a less-than-significant impact.

Mitigation: None required.

Operational Impacts

Impact 7B.8-4: Operation of uses developed under the Additional Housing Alternative B that could involve the transportation, use, storage and disposal of hazardous materials, would not present significant public health and/or safety risks to residents, visitors, and the surrounding area. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit. As a result, this alternative would have a corresponding increase in transportation, use, storage and disposal of hazardous materials associated with operation of these uses compared to the proposed Project. As described for the proposed Project, residential uses would typically include use of familiar hazardous materials such as toners, paints, and household cleaning products; and any building maintenance and landscaping activities associated with residential uses commonly involve use of fuels, oils, paints, lubricants, solvents, and pesticides. These common types of materials are typically stored and used in small quantities, and used in accordance with manufacturer recommendations. As such, the routine transport, use, storage or disposal of these materials under this alternative would not be reasonably expected to cause an adverse impact to the public and the environment.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, impacts associated with transportation, use, storage and disposal of hazardous materials associated with operation of those facilities under this alternative would be similar to the proposed Project. Development and operation of those facilities under this alternative would be subject to the same applicable regulatory requirements, and same oversight by Stanford's EH&S and the County's HMCD, as the proposed Project, which would similarly ensure potential exposure of people or the environment to hazardous materials would be less than significant impact.

Mitigation: None required.

Impact 7B.8-5: Hazardous materials used at facilities operating under Additional Housing Alternative B could potentially be spilled through upset or accidental conditions, but would not significantly increase public health and/or safety risks to future residents, workers, visitors, and the surrounding area. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated infrastructure, than the proposed 2018 General Use Permit. Any potential accidental releases of hazardous materials or wastes associated with operation of additional on-campus residential uses would be small in scale; similar to the proposed Project, potential effects to residents, workers, the public or the environment under this alternative would be less than significant.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, potential accidental releases of hazardous materials or wastes associated with operation of those facilities, and related potential adverse effects to residents, workers, the public or the environment would be similar to the proposed Project. Operation of those facilities would be subject to the same applicable regulatory requirements and management programs, and same oversight by Stanford's EH&S and the County's HMCD, as the proposed Project; the potential impact to workers, residents, visitors, or the environment would therefore be reduced to a less-than-significant level.

Mitigation: None required.

Impact 7B.8-6: New development under Additional Housing Alternative B could potentially be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thus, could result in a safety hazard to the public or environment. (*Potentially Significant*)

Additional Housing Alternative B would involve overall more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit, and therefore, would have a greater potential to develop in areas on the campus where residual hazardous materials may be present in the soil and cause significant impacts. However, implementation of **Mitigation Measures 7B.8-2(a)**, **7B.8-2(b)**, and **7B.8-2(c)** identified for this alternative, which are the same as those identified for the proposed Project, would ensure that any earthwork activities that occur on the Project site that may encounter suspicious materials would be adequately addressed, and thus, the potential for residual contamination to significantly impact the public or environment would be less than significant post-mitigation.

Mitigation: Implement Mitigation Measure 7B.8-2(a)-(c).

Significance after Mitigation: Less than Significant.

Impact 7B.8-7: Implementation of Additional Housing Alternative B could result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school, but would not create a significant hazard to those facilities. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated infrastructure than the proposed 2018 General Use Permit that could be located within one-quarter mile of an existing or proposed school. As discussed above, operation of residential uses involves common hazardous materials that are typically stored and used in small quantities. Accordingly, there are no characteristics associated with operation of the additional housing that would result in substantial hazardous emissions or handling of hazardous or acutely hazardous materials, substance, or waste that would result in adverse exposure to hazardous emissions at nearby schools.

Given that this alternative would involve operation of the same level of academic and academic support facilities (including laboratory and research uses) as the proposed Project, this alternative would similarly not include a substantive change in hazardous emissions, and all transportation, use, storage, and disposal of hazardous materials would be conducted in accordance with applicable local, State, and federal requirements. Therefore, similar to the proposed Project, implementation of the alternative would not result in any adverse exposure to hazardous emissions to existing or future schools within, or in the vicinity of, the Project site.

Mitigation: None required.

Impact 7B.8-8: Development facilitated by Additional Housing Alternative B would not substantially impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

Additional Housing Alternative B would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit. Therefore, this alternative would increase the on-campus residential population that would be served by emergency response and evacuation plans. As with new development proposed under the Project, any changes to the circulation network that may occur to accommodate additional housing under this alternative would be designed to accommodate appropriate emergency access to, and egress from, all areas of the Project site. Additionally, similar to the proposed Project, all project-specific designs, including private internal circulation and building site plans for the additional housing under this alternative would be subject to review and approval by emergency service providers, per Fire Code requirements. As with the proposed Project, under this alternative Stanford would continue to operate its Office of Emergency Management (OEM) and coordinate emergency response planning efforts with applicable jurisdictional emergency response providers, including County OEM; and also continue to maintain its emergency notification systems at Stanford via its AlertSU strategy. Therefore, similar to the proposed Project, these emergency response requirements would ensure this alternative would not substantially impair implementation of or physically interfere with any emergency response or evacuation plans. Impacts would be similar to those of the proposed Project.

Mitigation: None required.

Impact 7B.8-9: Development under Additional Housing Alternative B would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. (*Less than Significant*)

Additional Housing Alternative B would increase residential development and associated residential population on the campus compared to the proposed 2018 General Use Permit, and therefore, would increase the on-campus residential structures and residential population on the campus that would be exposed to risk involving wildland fires. This alternative would not

introduce housing development or increase population within the foothills, designated by the County as a wildland/urban interface. Rather, and similar to proposed Project, all additional housing that would be developed under this alternative would be located within the Academic Growth Boundary, including on infill and redevelopment sites. Similar to the proposed Project, additional on-campus housing that would be developed under this alternative would be required to include fire suppression design requirements as specified in current adopted building codes and would be served by sufficient fire protection services. As with the proposed Project, implementation of applicable fire and building code standards would ensure that adequate fire and life safety measures are incorporated into the alternative in compliance with all applicable state and local fire safety regulations. Similar to the proposed Project, these factors would reduce the potential impact associated with exposure of people and property to risk involving wildland fires under this alternative to a less than significant level.

Mitigation: None required.

Cumulative Impacts

Impact 7B.8-10: Hazards at the Additional Housing Alternative B site, in combination with past, present, and future projects could potentially contribute to cumulative hazards. (*Potentially Significant*)

The geographic scope of potential cumulative hazards and hazardous materials impacts encompasses primarily the Project site and immediate surrounding area. Cumulative hazardous materials effects could occur if activities that would occur under Additional Housing Alternative B at the Project site, and other past, existing and proposed development, together, would significantly increase risks in the vicinity of the Project site. As discussed above, the additional housing that would occur under this alternative would involve routine hazardous materials in relatively small quantities. As under the proposed Project, based on the existing management of hazardous materials and the continued oversight, guidance and compliance monitoring that would be conducted by Stanford's EH&S and/or County HMCD for all development on the campus, there would not be a substantial change in how hazardous materials are handled under this alternative. As a result of these existing regulatory requirements that apply to the Project site, and given that nearby off-site land uses would be subject to their own applicable regulations and internal standard operating procedures controlling the use, storage, and disposal of hazardous materials, the potential hazardous materials and hazard impacts would not combine to become cumulatively considerable.

Similar to the proposed Project, this alternative, as well as other past, present, and future projects would be required to adhere to existing regulatory requirements for the appropriate handling, storage, transportation, and disposal of hazardous materials that are designed to minimize exposure and protect human health and the environment. Cumulative increases in the transportation of hazardous materials and wastes would cause a less than significant impact because the probability of accidents is relatively low, and the use of legally required packaging minimizes the consequences of potential accidents.

During construction, implementation of Mitigation Measure 7B.8-2(a)-(c) would also reduce any contribution from this alternative to potential cumulative disturbance of soil and groundwater. Given this and all the other factors discussed above, the cumulative impact of this alternative to hazards and hazardous materials would be less than significant.

Mitigation: Implement Mitigation Measures 7B.8-2(a)-(c).

Significance after Mitigation: Less than Significant.

Impact 7B.8-11: Additional Housing Alternative B, in combination with past, present, and future projects would not substantially impair implementation or physically interfere with emergency response or evacuation plans. (*Less than Significant*)

As discussed in Impact 7B.8-11, above, site review for individual building projects and existing emergency response requirements are sufficient to ensure that the alternative's effect on potential impairment or implementation of any emergency response or evacuation plans would be considered a less-than-significant impact. Furthermore, regional plans such as the Local Hazard Mitigation Plan and the Santa Clara County Operational Area Emergency Operations Plan (EOP) are adaptive to changes in population and provide the inter-agency coordination to ensure that emergency response and evacuation can be effectively coordinated in an emergency. Therefore, the effects of the alternative would not combine to become cumulatively considerable.

Mitigation: None required.

Impact 7B.8-12: Additional Housing Alternative B, in combination with past, present, and future projects would not substantially contribute cumulatively to exposure to wildland fires. (*Less than Significant*)

Additional Housing Alternative B, as well as other land uses in the Project site vicinity would include the proper mechanisms to ensure the alternative's potential impacts to wildland fire hazards and emergency response access would be less than significant, and correspondingly, would also ensure the alternative's contribution to cumulative effects on wildland fires would also be less than significant.

Mitigation: None required.

Hydrology and Water Quality

Construction Impacts

Impact 7B.9-1: Additional Housing Alternative B construction could violate water quality requirements or waste discharge requirements, or otherwise degrade water quality. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction, including on infill and redevelopment sites, than would occur under the proposed Project. This alternative would also involve more subsurface construction requiring soil excavation than the proposed Project. As a result, this alternative would result in correspondingly greater earthwork activities during construction such as removal of surface vegetation, grading and excavation of soils, and potential placement of imported soil, which would could result in increased erosion and sedimentation. Similar to the proposed Project, as part of the approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, including implementation of construction BMPs, as detailed in a SWPPP, along with any additional use permit conditions that must be met regarding stormwater control and management during construction.

Similar to the proposed Project, inactive wells, if not abandoned appropriately, can present potential conduits for contamination from the surface to underlying groundwater resources. Unless the existing potential conduits are eliminated, this would be a significant impact under this alternative. Implementation of **Mitigation Measure 7B.9-1**, which is the same as that identified for the proposed Project, would require Stanford to refer to the well survey, prior to obtaining a demolition or grading permit for individual projects under this alternative to ensure that there are no wells within each building site that might need to be appropriately abandoned to eliminate this pathway for contamination.

Implementation of SWPPP requirements, as well as Mitigation Measure 7B.9-1, would prevent significant construction-related impacts to water quality, and ensure that all construction activities that would under occur under the alternative would minimize the potential to adversely affect receiving waters. Therefore, during construction, the potential water quality impacts of this alternative would be less than significant post-mitigation, similar to the proposed Project.

> **Mitigation Measure 7B.9-1:** Prior to issuance of a demolition or building permit, Stanford shall review its historic wells survey and confirm that no historic wells not properly closed are located at the project location to determine the potential for encountering any groundwater wells within the area of proposed improvements. If discovered, and the well is no longer part of operations and was not abandoned in accordance with SCVWD requirements, Stanford shall fulfill the well abandonment/ destruction permit requirements. Stanford shall contact SCVWD to locate existing inactive wells and confirm adherence to well abandonment/ destruction requirements.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7B.9-2: Additional Housing Alternative B construction could include temporary dewatering, but would not substantially deplete groundwater supplies or cause a lowering of the water table. ***(Less than Significant)***

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. Consequently, this alternative would require greater excavation of soils related to underground utilities, construction of building foundations, and in some cases, to accommodate underground levels, than the proposed Project. Similar to the proposed Project, if shallow groundwater were to be encountered during construction, excavations could require temporary dewatering of groundwater to create a dry working environment in order to complete construction.

Similar to the proposed Project, to address the possibility of rising groundwater at the Project site in the future, in the event that any new subgrade construction under this alternative would encounter several vertical feet of groundwater necessitating dewatering, Stanford would, as standard practice, stipulate a geologic/geohydrologic analysis be conducted to assess the potential for any localized consolidation/settlement effects, and identify appropriate measures to protect adjacent structures and infrastructure during construction.

As with construction related to the proposed Project, potential construction dewatering associated with this alternative would only be required for the duration of a portion of the construction period of an individual project. As a result, similar to the proposed Project, construction dewatering under this alternative would not result in long-term, large volume groundwater withdrawal that would lead to substantive depletion of groundwater supplies, permanent lowering of groundwater levels, or seasonal basin recharge. Therefore, as with the proposed Project, the potential impact to groundwater supplies and the water table during construction of individual projects under this alternative would be less than significant.

Mitigation: None required.

Operational Impacts

Impact 7B.9-3: Operation of Additional Housing Alternative B would not violate water quality requirements or waste discharge requirements, or otherwise substantially degrade water quality. ***(Less than Significant)***

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would result in more on-campus impervious surfaces compared to the proposed Project. Any increases in paved areas, building rooftops and parking lots under this alternative would have the potential to generate more polluted stormwater during storm events than under the proposed Project. Similar to the proposed Project, if not managed appropriately, increases in polluted stormwater would have the potential to violate water quality standards. Relatedly, any potential increase in use of herbicides

and pesticides under this alternative associated with additional landscaping could adversely affect the quality of receiving surface waters or groundwater.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, along with any additional use permit conditions that must be met, regarding stormwater control and management during operation. As with the proposed Project, adherence to stormwater control measures as a part of the RWQCB Municipal Regional MS4 Stormwater Permit would minimize the water quality impact from development that would occur under this alternative to a less-than-significant level by requiring all proposed development to include stormwater design measures that protect water quality.

Mitigation: None required.

Impact 7B.9-4: Additional Housing Alternative B operation could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. (*Potentially Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would result in more on-campus impervious surfaces compared to the proposed Project. As discussed in Section 5.9, Hydrology and Water Quality, the SCVWD has delineated an area known of the Project site known as the Unconfined Zone, where groundwater recharge by infiltration primarily occurs (as shown in Figure 5.9-4). Two of the four development districts which this alternative would add additional housing to – West Campus and East Campus – are located partially within the Unconfined Zone. The other two development districts which this alternative would add additional housing to – Quarry, and DAPER and Administrative Development Districts – are located completely outside the Unconfined Zone. If, under this alternative, increases in impervious surfaces from additional housing were introduced in this area of groundwater recharge, the amount of runoff that recharges into the underlying aquifer could be further reduced, a significant impact as with the proposed Project.

Similar to the proposed Project, new development under this alternative would be required to include on-site drainage plans designed to retain, capture and convey increased runoff in accordance with the SCVURPPP design standards and the Municipal Regional MS4 NPDES permit requirements that include Provision C.3 site control features. As a result, the additional housing associated with this alternative would be required to minimize the amount of stormwater discharge offsite. See also discussion of Stanford's detention facilities in Impact 7A.9-6, below, which encourage groundwater recharge.

Pursuant to the 2000 General Use Permit, Stanford implements a campus-wide plan for groundwater recharge to mitigate the loss of recharge areas from development that occurs within the Unconfined Zone; this involves the conveyance of a quantifiable amount of water from

Stanford's irrigation water supply to Lagunita reservoir, and the percolation of that water as recharge into the Unconfined Zone. Similar to mitigation identified for the proposed Project, **Mitigation Measure 7B.9-4**, below, would require continued implementation of this groundwater recharge plan with annual reporting to the County would ensure that future development that would occur in the Unconfined Zone under this alternative would not result in adverse effects to underlying groundwater levels.

As under baseline and proposed Project conditions, under this alternative, Stanford's groundwater wells would be used to supplement local surface water sources for the non-potable landscape irrigation system and, if needed, for the Lagunita reservoir to maintain water levels. Also, as under baseline and proposed Project conditions, under this alternative, Stanford would operate within its secured water rights for surface water diversion for non-potable uses. The additional housing that would be developed on-campus under this alternative would consist of multi-family housing, which would minimize the demand for non-potable water required for landscaping. Additionally, as under the proposed Project, Stanford would use of low-water-demand native plants in landscaped areas of the campus, minimizing the non-potable water demand. As a result, total landscape irrigation demand under this alternative would be similar to the proposed Project, and would not expected to substantively change from baseline conditions.

However, based on a Water Supply Assessment (WSA) prepared by Stanford for the Additional Housing Alternative B (see Utilities and Service Systems below for additional detail), in single and multiple dry water year scenarios, Stanford would need to supplement its potable water supply (i.e., its guaranteed allocation of potable water purchased wholesale from San Francisco Public Utilities Commission) with treated groundwater from its wells in order to accommodate the estimated increase in potable water demand from the additional on-campus housing. Under all water year scenarios, the total groundwater demand for this alternative would not exceed 1.35 mgd (see Utilities and Service Systems, below, for additional detail). As discussed in Section 5.16, Stanford can withdraw up to 1.52 mgd from its wells without adversely affecting groundwater conditions. As a result, similar to the proposed Project, the projected groundwater use for this alternative could be safely withdrawn without causing excessive drawdown in the aquifer. Additionally, Stanford could implement more stringent water conservation measures beyond those implemented historically to further minimize increases in groundwater use.

This alternative would also involve more subsurface construction than the proposed Project. While, as discussed in Section 5.16, Stanford reports that no subgrade building construction to date within the Project site has encountered groundwater, if needed to address the possibility of rising groundwater at the Project site in the future, Stanford would strengthen building foundations to withstand the hydrostatic pressures and waterproofing the structure appropriately. As with the proposed Project, this would avoid any potential localized effects on groundwater levels from conducting long-term groundwater dewatering via pumping for new buildings under this alternative, and correspondingly, avoid adding extracted groundwater to the storm drain system.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with any conditions that must be met regarding groundwater use and recharge during operation. Therefore, the drainage

control requirements, the projected use of groundwater wells, and the implementation of the Groundwater Recharge plan as identified in Mitigation Measure 7B.9-4, would assure onsite infiltration such that development that would occur under this alternative would not substantively reduce the aquifer volume or lower the local groundwater level. Similar to the proposed Project, the potential impact under this alternative would therefore be less than significant.

> **Mitigation Measure 7B.9-4:** Stanford Utilities shall review individual projects proposed under the Additional Housing Alternative B for changes in impervious surface area within the Unconfined Groundwater Zone. The accounting of the recharge effort shall be tracked to ensure that all future development will continue to result in an annual net positive recharge in the Unconfined Groundwater Zone. Record of monitored data shall be submitted to the County on an annual basis and Santa Clara Valley Water District and include both water volumes and water quality data.
>
> **Significance after Mitigation:** Less than Significant.

Impact 7B.9-5: Additional Housing Alternative B development would potentially alter the drainage pattern of the Project site, but would not result in substantial erosion or siltation on or off the site. (*Less than Significant*)

Additional Housing Alternative B would involve more site development than the proposed Project, and consequently may involve greater alteration of drainage patterns on the Project site. As under the Project, if not managed properly, localized changes in drainage patterns for individual developments that would occur under this alternative could create new impervious surfaces that would increase the amount of surface run-off; and hence cause erosion of exposed soils resulting in sedimentation and siltation of discharge flows on- or off-site.

As discussed in Impact 7B.9-3, above, implementation of design features in accordance with drainage control requirements would be effective in controlling erosion potential and minimizing transport of siltation on or off site. Therefore, similar to the proposed Project, localized changes in on-site drainage patterns associated with development under this alternative would not result in substantial erosion or siltation, and with adherence to stormwater control measures as a part of the Municipal Regional NPDES MS4 stormwater permit, the potential impact is considered less than significant.

> **Mitigation:** None required.

Impact 7B.9-6: Additional Housing Alternative B development would create runoff, but would not exceed the capacity of existing or planned stormwater infrastructure, or result in flooding on- or off-site. (*Less than Significant*)

Additional Housing Alternative B would involve more site development than the proposed Project, and consequently would involve more impervious surfaces on the Project site. Similar to the proposed Project, if any resulting increases in stormwater were not managed properly, this

alternative could result in an increase in peak flows in, and potentially affecting the capacity of, the downstream storm drainage infrastructure, and potentially exacerbate existing or create new flooding conditions.

As under the proposed Project, in order to accommodate post-development increases in runoff from new development under this alternative, each individual project would be required to develop a drainage plan that complies with the County's drainage design standards and the requirements of the SCVURPPP including flow control, and NPDES Provision C.3 requirements for storm capacity minimums. The County's drainage design standards require that project stormdrainage infrastructure be designed to adequately convey all runoff from peak storm events. Any potential increases in stormwater runoff resulting from additional impervious surfaces must be detained to ensure peak flows do not result in on-site or downstream flooding.

As discussed in Section 5.9, Hydrology and Water Quality, as a condition of the 2000 General Use Permit, Stanford developed on-site detention facilities on a watershed basis to create sufficient capacity to offset increased runoff associated with all new impervious surfaces constructed under the 2000 General Use Permit. In 2018, the existing detention facilities are estimated to have the capacity for accommodating an additional approximate 57.0 acres (2.48 million square feet) of impervious surfaces in the San Francisquito watershed, and an additional approximate 194.8 acres (8.52 million square feet) of impervious surfaces in the Matadero watershed. In accordance with Stanford Community Plan Policy SCP-HS 9, all development would require infrastructure improvements to accommodate runoff so as to achieve no increase in peak flow rate. Similar for the proposed Project, this remaining detention capacity would also be more than adequate to accommodate the net increase in impervious surfaces that would occur under this alternative.

As discussed in the Project Description for Additional Housing Alternative B, the placement of housing at the edges of the West Campus and DAPER Development Districts under this alternative could require development of lands that are currently used for existing recreation fields and/or detention basins located in these areas. Under this circumstance, Stanford would provide replacement stormwater detention facilities with an equivalent detention capacity.

Similar to the proposed Project, as part of the County approval process for individual projects under this alternative, the County would require Stanford to demonstrate compliance with all applicable regulatory requirements, along with any conditions that must be met, regarding stormwater control and management during operation. Pursuant to the County-approved Stanford Storm Drainage Master Plan, Stanford reports to the County annually regarding the remaining capacity for the existing detention facilities. The detention facilities are designed to accommodate the 100-year design storm flow. Mandatory compliance with the Storm Drainage Master Plan, the County's drainage design standards, SCVURPPP, and NPDES requirements, as required by law, would ensure that proposed development under the alternative would include adequate storm drainage control features, including potential detention facilities and features that promote onsite infiltration. As such, similar to the proposed Project, effects on increases in peak runoff and capacity of existing or planned stormwater infrastructure under this alternative would be considered less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7B.9-7: Additional Housing Alternative B, in combination with past, present, and future projects could potentially contribute to surface and groundwater quality impacts. *(Potentially Significant)*

The geographic scope of potential hydrology and water quality impacts are the study watersheds. Construction and operation of the development under this alternative, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively increase stormwater runoff and pollutant loading in the study watersheds, and hence, to the San Francisco Bay. Construction related to alternative, in combination with other cumulative development, could also affect groundwater quality. As under the proposed Project, development associated with this alternative and other current and future projects in the watersheds would be required to comply with current construction, drainage and grading requirements intended to control runoff and regulate water quality at each site. Similarly, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. As with the proposed Project, new development projects in the affected watersheds in Santa Clara and San Mateo Counties also would be required to comply with the regionally based MS4 NPDES permitting requirements. All construction work disturbing more than one acre in the surrounding areas would require permits from the RWQCB which require all activities to implement BMPs to minimize adverse effects to water quality. The NPDES permits, both the General Construction Permit and the MS4, are based upon addressing cumulative contributions to a watershed and as a result include requirements to implement BMPs that protect water quality to the maximum extent practicable. Further, Mitigation Measure 7B.9-1 would serve to minimize any contribution from this alternative to significant cumulative effects on groundwater quality. Therefore, similar to the proposed Project, the effect of this alternative on surface and groundwater quality, in combination with other cumulative projects, would be less than significant.

Mitigation: Implement Mitigation Measure 7B.9-1.

Significance after Mitigation: Less than Significant.

Impact 7B.9-8: Additional Housing Alternative B, in combination with past, present, and future projects could potentially contribute to depletion in groundwater supplies or interfere with groundwater recharge. *(Potentially Significant)*

As with the proposed Project, construction and operation of the proposed development under this alternative, together with past, present and other reasonably foreseeable future projects in the vicinity could cumulatively decrease groundwater supplies and interfere with groundwater recharge. As discussed in Section 5.9, Hydrology and Water Quality, the Santa Clara Valley Groundwater Basin is not currently in an overdraft condition and is actively managed by the SCVWD. The

SCVWD is designated by the DWR as the exclusive Groundwater Sustainability Agency (GSA) for the Santa Clara Subbasin, which comprises a portion of the larger Santa Clara Valley Basin. A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. A GSA must submit and implement a GSP or prescribed alternative under the Sustainable Groundwater Management Act of 2014. The SCVWD submitted the 2016 Groundwater Management Plan for the Santa Clara and Llagas Subbasins to DWR as an Alternative to a GSP in December 2016. Under this alternative, Stanford would also continue implementation of the Campus-wide Plan for Groundwater Recharge, as specified in Mitigation Measure 7B.9-4, above, to ensure that any loss of recharge areas due to new development under this alternative is addressed through management of Lagunita reservoir as described above. Therefore, considering the projected use of groundwater for the alternative, the proposed landscaping vegetation, current and future management of the groundwater basin and continued adherence to the groundwater recharge plan as overseen by SCVWD, there would be a less than significant cumulative impact to groundwater levels or supplies under this alternative.

Mitigation: Implement Mitigation Measure 7B.9-4.

Significance after Mitigation: Less than Significant.

Impact 7B.9-9: Additional Housing Alternative B, in combination with past, present, and future projects would not result in substantial adverse cumulative surface hydrology impacts. (*Less than Significant*)

Implementation of this alternative, together with past present and other reasonably foreseeable future projects in the vicinity, could also expose people and/or property to flooding from a 100-year event. These effects could occur through increases in stormwater runoff volumes that overwhelm drainage infrastructure or during high tide in a 100-year storm event along with sea level rise in the Bay. This alternative and other cumulative projects in the vicinity would be required to comply with flood control requirements intended to provide flood protection. Additionally, new projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows. New development projects in the County also would be required to comply with County flood control requirements. As discussed above, as with the proposed Project, this alternative would include structural measures designed to convey stormwater flows through improvements to existing infrastructure such that runoff volumes do not exceed existing flows during peak storm events. Therefore, this alternative, in combination with other cumulative projects, would not result in a significant cumulative impact to people and/or property from a 100-year event. Similar to the proposed Project, this alternative would have a less than cumulatively considerable impact, and cumulative effects, therefore, would be less than significant.

Mitigation: None required.

Land Use and Planning

Impact 7B.10-1: Additional Housing Alternative B could conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant*)

As under the proposed Project, it is assumed that the additional increment of on-campus housing that would occur under Additional Housing Alternative B would be located within the Academic Growth Boundary and would not be constructed within the Campus Open Space land use designation (including the Arboretum Development District). It is further assumed under this alternative that no additional increment in on-campus housing under this alternative would be placed in the Campus Center, Lagunita, Lathrop, or San Juan Development Districts. The additional housing (1,275 units) that would be developed under this alternative would be located in the East Campus, Quarry, DAPER and Administrative, and/or West Campus Development Districts.

Based on the Stanford Community Plan Policy SCP-LU 3 that faculty/staff housing within the Academic Campus must be at least 15 units per acre, and consistent with its policies promoting compact urban development, it is reasonable to assume that additional faculty/staff and/or other worker housing that would occur under this alternative would be multi-family housing. Stanford indicates that densities for the additional multi-family housing that would be developed under this alternative would range from about 40 to 80 units per acre. The effects on the four development districts where additional housing is proposed under this alternative are described below.

East Campus Development District

Development in the East Campus Development District under this alternative includes 1,841 new housing units/beds (241 more units than the proposed Project, including an additional 137 faculty, staff, postdoctoral student and/or other worker units as well as 104 graduate student beds) and 20,000 square feet of academic and academic support space (same as the proposed Project). Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. Stanford indicates that placement of additional housing in this district would likely require redevelopment and intensification of existing residential sites within the Escondido Village area. Proposed additional housing development under this alternative would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

Quarry Development District

Development in the Quarry Development District under this alternative includes 1,100 new housing units (550 more faculty, staff, postdoctoral student and/or other worker units than under the proposed Project) and 200,000 square feet of academic and academic support space (same as the proposed Project). As noted above, Stanford anticipates that the housing density would be approximately 80 units per acre and building heights would be up to 135 feet in this district. In addition, this alternative is assumed to include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the Quarry Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building

height limits of 50 feet within 100 feet of the El Camino Real right-of-way. Proposed additional housing development under this alternative would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

DAPER and Administrative Development District

Development in the DAPER and Administrative Development District under this alternative includes the additional 242 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with up to 200,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, Stanford would not construct housing within the Campus Open Space designated lands in the district that are located between Stanford Stadium and El Camino Real. Stanford indicated that placement of housing along El Camino Real could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. In addition, this alternative could include modification to the *Plan for the El Camino Real Frontage* for additional faculty/staff housing that would occur in the DAPER and Administrative Development District, which currently establishes a 20-foot setback from the property line along El Camino Real and building height limits of 50 feet within 100 feet of the El Camino Real right-of-way. New housing proposed under this alternative would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

West Campus Development District

Development in the West Campus Development District under this alternative includes the additional 242 faculty, staff, postdoctoral student and/or other worker units identified by this alternative, along with 35,000 square feet of academic and academic support space that was proposed under the Project. Additional housing proposed under this alternative could result in buildings up to 135 feet in height, at densities up to 80 units per acre. As under the Project, with this alternative Stanford would not construct housing within the Campus Open Space designated lands currently occupied by the Palo Alto Stock Farm Stable (Red Barn), and another narrow strip of land along Campus Drive near its intersection with Junipero Serra Boulevard. As with the DAPER and Administrative Development District, Stanford indicated that placement of housing along Sand Hill Road could require development of lands that are currently used for recreation fields and/or detention basins, which would need to be relocated elsewhere on the campus. New housing proposed under this alternative in this district would be consistent with the Academic Campus land use designation, provided any potential faculty, staff, postdoctoral student and/or other worker housing would meet or exceed the density requirements of Stanford Community Plan Policy SCP-LU 3.

Summary

As under the proposed Project, housing development proposed by Additional Housing Alternative B would be consistent with the Growth and Development policies of the Stanford Community Plan by reducing potential environmental effects that could result from development of Stanford

lands outside the Academic Growth Boundary. The additional housing proposed by this alternative would be consistent with the existing land use designations for Stanford lands described in the Stanford Community Plan. Similar to the proposed Project, at the time individual housing projects are proposed under this alternative, the County would require Stanford to apply for project-specific approvals; these projects may be subject to additional environmental review prior to consideration of approval by the County. Similar to the proposed Project, this alternative would have a less-than-significant impact regarding consistency with land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation: None required.

Cumulative Impacts

Impact 7B.10-2: Additional Housing Alternative B, in combination with past, present, and future projects could potentially contribute to cumulative land use impacts. (*Less than Significant*)

The geographic scope of potential cumulative land use impacts encompasses the Stanford lands within the General Use Permit boundary, Stanford lands adjacent to the boundary and not under County of Santa Clara jurisdiction, and adjacent, non-Stanford lands in other jurisdictions.

Lands that border the four development districts where additional housing would occur this alternative include Stanford lands within Palo Alto, such as the Stanford University Medical Center and Stanford Shopping Center, as well as non-Stanford lands within Palo Alto along El Camino Real and the College Terrace residential neighborhood. These areas are generally developed urban areas. Reasonably foreseeable growth within Palo Alto in areas adjacent to the development districts in which additional housing is proposed would represent intensification of existing land uses. Less than significant cumulative land use impacts would result from development under this alternative combining with impacts of past, present, or reasonably foreseeable future projects in areas of Palo Alto that border those development districts.

Mitigation: None required.

Noise and Vibration

Construction Impacts

Impact 7B.11-1: Additional Housing Alternative B could expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction. (*Significant*)

Additional Housing Alternative B would involve more on-campus construction compared to the proposed Project due to the additional on-campus housing under this alternative. Thus, Additional Housing Alternative B would have the potential for greater construction noise effects than the proposed Project over the duration of the use permit. Construction activities would involve the

same sources of noise as that would occur for the proposed Project. Consequently, as presented in **Table 7B.11-1**, the estimated construction noise for various phases of construction activity at distances of 50, 100, 150 and 300 feet from the construction site, would be the same as for the proposed Project.

TABLE 7B.11-1
NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT VARIOUS DISTANCES

Distance from Construction Site	Noise Levels in dBA (Hourly Leq)				
	Demolition	Site Preparation	Grading	Building Construction	Paving
50 feet	85.1	80.4	79.7	83.5	83.5
100 feet	79.1	74.4	73.7	77.5	77.5
150 feet	75.5	70.9	70.2	74.0	74.0
300 feet	69.5	64.9	64.2	68.0	67.9

SOURCE: Adapted from Bolt Baranek and Newman, 1971.

The Santa Clara County Ordinance Code establishes different construction noise limits for different land use areas. The most restrictive construction noise limit is 75 dBA for mobile equipment at single family residential areas, such as those off-site residences located across Stanford Avenue from the Project site. Although the County ordinance does not identify a construction noise limit for schools, it is reasonable to also apply this noise limit to nearby schools, day care facilities and other noise sensitive receptors. As can be seen from Table 7B.11-1, construction closer than 150 feet from off-site receptors would have the potential to result in noise levels in excess of the County's noise standard, which would be a significant impact under Additional Housing Alternative B, as under the proposed Project.

Similar to the proposed Project, during the life of Additional Housing Alternative B, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods to minimize potential noise and vibration disruption.

The County Ordinance Code establishes restrictions on the hours of noisy construction activity. The County Ordinance Code prohibits such activity on weekdays and Saturday between the hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, except for emergency work of public service utilities or by variance. As with the proposed Project, if construction activities under this alternative were to occur within these prohibited hours, this alternative would result in a significant impact, irrespective of whether a variance is granted. Implementation of **Mitigation Measure 7B.11-1**, the same mitigation proposed for the Project, would ensure that construction that occurs under Additional Housing Alternative B would be consistent with the County's noise ordinance. It is noted that the Palo Alto Municipal Code is slightly more restrictive, prohibiting such work between the hours of 6:00 p.m. and 8:00 a.m. Monday through Friday and between 6:00 p.m. and 9:00 a.m. on Saturday, or at any time on Sundays and holidays.

> **Mitigation Measure 7B.11-1:** *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.* If construction would be within 150 feet of off-site sensitive receptors, Stanford shall employ noise attenuation measures to reduce the generation of

construction noise to achieve a performance standard of 75 dBA at the affected property line of the nearest off-site single family residential receptor and 80 dBA at the affected property line of the nearest off-site multi-family residential receptor. These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards set forth in the County Ordinance Code.

Additional measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- For construction within the Project site that would be 150 feet of sensitive receptors located within the City of Palo Alto, hours of construction activity shall be restricted to those established in the City of Palo Alto Noise Ordinance (i.e., between the hours of eight a.m. to six p.m. Monday through Friday, and between nine a.m. and six p.m. on Saturday).

  For construction within the Project site that would be 150 feet of sensitive receptors located within all other residential areas, hours of construction activity shall be restricted to those established in the Santa Clara County Noise Ordinance (i.e., between seven a.m. and seven p.m., Monday through Saturday).

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 75 dBA;

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and

- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Emission of sound in the performance of emergency work is exempt from these requirements. In addition, variances to these restrictions may be allowed, with County approval, for certain utility work or other construction for which nighttime work would avoid secondary impacts (e.g., traffic impacts during commute periods); and where compliance with the noise thresholds is technically or economically infeasible. A variance may be granted only where the activity will not create a nuisance and will not be detrimental to the public health and safety.

Significance after Mitigation: Less than Significant.

Impact 7B.11-2: Additional Housing Alternative B construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity. (*Significant*)

Similar to the proposed Project, the potential exists for construction-related noise generated by Additional Housing Alternative B to be consistent with the standards established in the local general plan and noise ordinance assessed above in Impact 7B.11-1, and still result in a substantial temporary or periodic increase in ambient noise levels. Temporary increases in construction noise would potentially affect both on-site and off-site receptors.

Potential Construction-Related Noise Increases Impacts at Off-Site Receptors

This alternative would result in the additional housing development being located at the edges of the West Campus Development District (along Sand Hill Road), Quarry and DAPER and Administrative Development Districts (along El Camino Real), and/or East Campus Development District (along El Camino Real and Stanford Avenue). Consequently, this alternative could expose more off-site receptors to construction noise than the proposed Project. Similar to the proposed Project, off-site sensitive receptors near Stanford development districts designated for development under Additional Housing Alternative B include those along Stanford Avenue (e.g., Escondido Elementary School and residences in the College Terrace neighborhood), across El Camino Real (e.g., residences in the Southgate neighborhood) and residences along the northwest side of Sand Hill Road. As indicated in Table 5.11-1 in Section 5.11, Noise and Vibration, in the Draft EIR, existing daytime noise levels at these sensitive receptor locations range from 60 to 64 dBA. The nearest off-site sensitive receptors are located as close as 80 feet from the Project site boundary. As shown in Table 7A.11-1, construction noise levels could be as high as 80 dBA at 100 feet. As under the proposed Project, for construction under Additional Housing Alternative B that would occur at or near the Project site boundary, construction noise levels would be 15 to 20 dBA above existing ambient noise levels at off-site sensitive receptors and potentially higher at on-site receptors, which would be a significant impact. Implementation of **Mitigation Measure 7B.11-1** identified above, which implements a performance standard, will reduce this impact, where it is technically and economically feasible to do so. As under the proposed Project, individual projects that would occur under Additional Housing Alternative B would be subject to additional review through the County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, and because it is unknown whether conditions justifying a variance might occur, it is possible that temporary or periodic increases in ambient noise in the vicinity of Additional Housing Alternative B would remain significant, even with implementation of noise reduction mitigation. Consequently, this impact is considered significant and unavoidable.

Potential Construction-Related Noise Increases Impacts at On-Site Receptors

Additional Housing Alternative B would result in more on-site construction than the proposed project, and would have a larger on-site residential population that could be exposed construction noise. As under the proposed Project, within the vicinity of the Project site under Additional Housing Alternative B, residential uses inclusive of on-site residential, day care or instructional classroom land uses would be considered noise sensitive to potential construction-related impacts

of the proposed Project. These on-site receptors could be 50 feet or closer to construction activities that would occur under this alternative. Consequently, temporary construction-related noise increases to on-site receptors could be 15 dBA or greater, and thus would also be significant. As is done currently, and similar to the proposed Project, Stanford would manage and modify its instructional classroom activities under this alternative as needed to ensure temporary construction noise-related effects to instructional classroom land uses would be less than significant. Implementation of **Mitigation Measure 7B.11.2**, the same mitigation proposed for the Project, identifies a minimum construction noise performance standard for noise effects to on-site residential or day care land uses that will reduce construction noise impacts, where it is technically and economically feasible to do so. Similar to the proposed Project, it is expected that individual projects that would occur under Additional Housing Alternative B would be subject to additional review through the County's ASA or other approval processes, and additional noise reduction measures may be imposed at that time.

Nevertheless, given that the proximity of impacted receptors may preclude a reduction of noise to a less than 15 dBA increase, it is possible that temporary or periodic increases in ambient noise in the Project site vicinity would remain significant, even with implementation of noise reduction mitigation. Consequently, similar to the proposed Project this impact under this alternative is considered significant and unavoidable.

Mitigation: Implement Mitigation Measure 7B.11-1 noise impacts at off-site receptors.

Mitigation Measure 7B.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.* For construction activities over two weeks in duration, and within 150 feet of on-site sensitive receptors, Stanford shall identify noise attenuation measures to reduce the generation of construction noise to achieve a minimum performance standard of 80 dBA, Leq over an 8-hour period at the nearest on-site residential or day care land use.[69] These measures shall be described in a Noise Control Plan that shall be submitted for review and approval by the County Planning and Development Department prior to issuance of a building permit to ensure that construction noise is consistent with the standards.

If necessary to achieve the minimum performance standard stated above, measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels to below 80 dBA;
- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed

[69] Consistent with noise criteria used by FTA for construction activities in vicinity of residential land uses (FTA, 2006).

air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to approximately 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible; and

- Stationary construction noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Significance after Mitigation: Significant and Unavoidable.

Impact 7B.11-3: Additional Housing Alternative B construction could result in temporary exposure of persons to or generation of, excessive groundborne vibration or groundborne noise levels in the Project site vicinity. (*Significant*)

Additional Housing Alternative B would involve more on-campus construction compared to the proposed Project due to the additional on-campus housing under this alternative. Thus, Additional Housing Alternative B would have the potential for greater construction groundborne vibration and noise effects than the proposed Project over the duration of the use permit.

A variety of construction activities can propagate ground-borne vibration, demolition (e.g., use of hoe-rams for demolishing large concrete structures), grading activities (e.g., use of vibratory rollers for soil compaction) and pile installation for foundations. As with the proposed Project, under Additional Housing Alternative B, Stanford would not conduct any impact pile driving on construction projects necessitating piles, but rather, would use alternative pile installation methods (e.g., drilling to place piles) to minimize potential noise and vibration disruption.

As discussed for the proposed Project, the vibration threshold for architectural damage to historic buildings and structures is 0.12 PPV (in/sec), the vibration threshold for damage to all other structures is 0.3 in/sec, and the vibration threshold for an adverse human reaction is 0.1 in/sec. Similar to the approach taken for the proposed Project, this impact analysis conservatively assumes that construction under Additional Housing Alternative B could occur within the immediate vicinity of one or more of Stanford's historic structures.

Groundborne vibration from grading, excavation, and building construction could produce substantial temporary vibration levels at nearby sensitive receptors, as well as at nearby structures. The extent to which these receptors and structures would be affected by groundborne vibration depends largely on soil conditions, building design and materials, construction techniques employed, distance from the construction site to the receptor and structure, and the age and condition of the structure.

Typical reference vibration levels for various pieces of construction equipment are listed below in **Table 7B.11-2**.

TABLE 7B.11-2
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment/Activity	PPV at 25 ft (inches/second)[a]
Jackhammer	0.035
Loaded Trucks	0.076
Caisson Drilling (represents Auger Drilling Pile Installation)	0.089
Large Bulldozer	0.089
Hoe Ram	0.089
Vibratory Roller	0.210

SOURCE: FTA, 2006 (Table 12-2, p. 12-12).

As shown in Table 7B.11-2, the use of vibratory rollers would have the potential to create the greatest vibration levels during construction. Based on the vibration velocities in Table 7A11-2, vibratory rollers would have the potential to cause damage to historic buildings and structures to if it were to occur within an estimated 40 feet of those structures. This would also be the distance from residential land uses at which the adverse human reaction of 0.1 in/sec would start to be exceeded. Construction activities would have the potential to cause damage to modern structures at a distance of 20 feet.

Similar to the proposed Project, due to the proximity of historic structures within the Project site to construction activities that would occur under Additional Housing Alternative B, construction vibration levels could exceed building damage and adverse human reaction threshold, resulting in a significant impact. Implementation of **Mitigation Measure 7B.11-3**, the same mitigation as that identified for the proposed Project, would address this impact, and ensure it would be reduced to a less-than-significant level.

> **Mitigation Measure 7B.11-3:** *Construction Vibration Reduction Plan.* If construction involving vibratory rollers, hoe rams, or large bulldozers is proposed within 40 feet of an historic structure, Stanford shall develop a Vibration Reduction Plan in coordination with an acoustical consultant, geotechnical engineer, and/or construction contractor, for review and approval by the County Planning and Development Department. Measures and controls shall be identified based on project-specific final design plans, and may include, but are not limited to, either or both of the following:
>
> 1. Use non-vibratory excavator-mounted compaction wheels and small smooth drum rollers for final compaction of asphalt base and asphalt concrete. If needed to meet compaction requirements, smaller vibratory rollers will be used to minimize vibration levels during repaving activities where needed to meet vibration standards.
>
> 2. Implementation of buffers and the use of specific types of equipment to minimize vibration impacts during construction at nearby receptors in order to meet a performance standard of 0.12 inches per second PPV at historic buildings and 0.3 inches per second PPV at non-historic buildings.
>
> 3. Implementation of a vibration, crack, and line and grade monitoring program for identified historic buildings located within 40 feet of construction activities, in coordination with a geotechnical engineer and qualified architectural historian.

Significance after Mitigation: Less than Significant.

Operational Impacts

Impact 7B.11-4: Additional Housing Alternative B could increase long-term noise levels in the Project vicinity to levels in excess of applicable noise standards. (*Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit and therefore, would have more on-site noise sources and more on-site noise-sensitive receptors than the proposed Project.

Similar to the proposed Project, new development under Additional Housing Alternative B would generate noise from heating, ventilating, and air conditioning mechanical equipment that would serve each building. Emergency backup generators, if required for new buildings, would be tested regularly and operated occasionally. Typically, the Bay Area Air Quality Management District (BAAQMD) permits emergency backup generators to operate for up to 50 hours per year, or on average about one hour per week.

While, as under the proposed Project, the specific location of new buildings (and associated building mechanical equipment) that would be developed, and the distance to the nearest sensitive receptors, is not known for this alternative at this time, development under Additional Housing Alternative B would occur on County lands and therefore would be required to comply with the noise restrictions of the Santa Clara County noise ordinance.

Future uses within the Project area could require loading docks. Noise levels of 80 dBA L_{max} and 60 dBA L_{eq} at a distance of 50 feet can be generated during loading dock activities (ESA, 2008).

Existing off-site sensitive receptors in the jurisdictions of Palo Alto and Menlo Park are located as close as 80 feet to the Project site. Consequently, as was assumed for the proposed Project, it is conservatively assumed that mechanical equipment operation and loading dock activity from new development under Additional Housing Alternative B could increase noise levels at the nearest off-site sensitive receptor by more than the 6 dBA allowed by the City of Palo Alto Noise Ordinance and create a noticeable increase in ambient noise levels above baseline noise levels. Similar to the proposed Project, increased noise from building mechanical equipment under Additional Housing Alternative B is identified as a significant impact.

> **Mitigation Measure 7B.11-4:** *Shield or Enclose HVAC Equipment and Emergency Generators.* Noise levels from mechanical equipment within 150 feet of sensitive receptors shall be minimized by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment achieves the following noise standards at the property line of an offsite sensitive land uses in Palo Alto or Menlo Park, or at the nearest on-site residential, day care or instructional classroom land use:

- The project shall not cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB;
- The project shall not cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB;
- The project shall not cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.

Noise levels from the periodic testing of emergency generators within 150 feet of sensitive receptors in the cities of Palo Alto or Menlo Park also shall be minimized by proper siting and through installation of acoustical shielding. Scheduled testing of an emergency generator must not occur before 7:00 a.m. or after 7:00 p.m.

Significance after Mitigation: Less than Significant.

Impact 7B.11-5: Additional Housing Alternative B traffic would not substantially increase traffic noise levels in the vicinity of the Project site. (*Less than Significant*)

As under the proposed Project, additional traffic generated by Additional Housing Alternative B would increase noise levels on the roadway network. A traffic-related ambient noise increase of either 3 or 5 dBA or more would be considered a significant impact, depending the existing roadway noise levels, where sensitive receptors are located along the affected roadway segments. Traffic noise levels at intersections most affected by traffic from Additional Housing Alternative B were modeled using the FHWA Traffic Noise Prediction Model and the turning movements for 2018 Baseline and 2018 Baseline plus Project conditions from the transportation analysis.

The roadway segments analyzed and results of the modeling are shown in **Table 7B.11-3**. As shown in Table 7B.11-3, under the 2018 Baseline plus Additional Housing Alternative B scenario, traffic noise would increase no more than 0.6 dBA (less than the minimum 3 dBA threshold) on all evaluated roadway segments. Therefore, development under Additional Housing Alternative B would result in a less than significant operational traffic noise impact. This is a similar conclusion that was reached for the proposed Project, where the traffic noise would increase between 0.1 and 0.5 dBA, and also less than the minimum 3 dBA threshold.

Mitigation: None required.

Cumulative Impacts

Impact 7B.11-6: Additional Housing Alternative B construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to cumulative noise impacts. (*Significant*)

Similar to the proposed Project, development under Additional Housing Alternative B may be constructed during the same time and duration as cumulative projects in the area, and could result in a contribution to construction noise levels. The geographic study area for cumulative construction impacts is defined as a 500-foot radius around the Project site.

TABLE 7B.11-3
TRAFFIC ROADSIDE NOISE LEVELS IN THE PROJECT SITE VICINITY

Roadway Segment	Baseline (2018) (A)	Baseline Plus Additional Housing Alternative B (2018) (B)	Difference between Additional Housing Alternative B and Baseline (B-A)	Cumulative No Project (2035) (C)	Cumulative Plus Additional Housing Alternative B (2035) (D)	Difference between Cumulative Plus Additional Housing Alternative B 2018 Baseline (D-A)	Difference between Cumulative Plus Additional Housing Alternative B and Cumulative No Additional Housing Alternative B (D-C)
Sand Hill Road							
between Stock Farm Road and Pasteur Drive	70.3	70.6	0.3	70.6	70.8	0.5	0.2
between Santa Cruz Avenue and Stock Farm Road	70.9	71.2	0.3	70.9	71.2	0.3	0.3
between Saga Lane and Sharon Park Drive	70.9	71.1	0.2	70.7	70.9	0.0	0.2
El Camino Real							
between Churchill Avenue and Serra Street	71.2	71.6	0.4	72.4	72.7	1.5	0.3
Junipero Serra Boulevard							
between Campus Drive and Stanford Avenue	68.1	68.5	0.4	68.7	69.0	0.9	0.3
between Stanford Avenue and Page Mill Road	68.7	69.3	0.6	69.4	69.8	1.1	0.4
Foothill Expressway							
between Arastadero Road and Edith Avenue	72.3	72.5	0.2	74.2	74.3	2.0	0.1
Alpine Road							
between I-280 and Junipero Serra Boulevard	69.8	70.1	0.3	70.2	70.5	0.7	0.3
Oregon Expressway							
between El Camino Real and Middlefield Road	71.3	71.4	0.1	71.9	72.0	0.7	0.1
Embarcadero Road							
between Town & Country and Middlefield Road	65.9	66.2	0.3	67.1	67.3	1.4	0.2
Stanford Avenue							
between Bowdoin Avenue and El Camino Real	61.3	61.8	0.5	61.6	62.1	0.9	0.5

NOTES:

Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

SOURCE: FHWA, 2006 and ESA, 2018

The most notable off-site cumulative project that would generate construction noise within this screening distance would be the final stages of construction for the SUMC Renewal Project. Construction noise impacts associated with the SUMC Renewal Project were identified as significant and unavoidable at both the project-level and cumulative scenario in the *Stanford University Medical Center Facilities Renewal and Replacement Draft EIR*. The great majority of construction associated with the SUMC Renewal Project would be completed prior to commencement of construction under Additional Housing Alternative B. However, the SUMC Renewal Project's replacement buildings for the School of Medicine and some of that project's hospital/clinic square footage would be constructed during implementation of Additional Housing Alternative B and, consequently, similar to the proposed Project, could overlap with construction

Additional Housing Alternative B. This could include housing construction that would occur within the Quarry and West Campus Development Districts under this alternative.

Similar to the proposed Project, given that construction noise from development under Additional Housing Alternative B would be significant, as described under Impacts 7B.11-1 and 7B.11-2, and that construction noise from the SUMC Renewal Project would be significant, there could be a significant cumulative construction noise impact. Consequently, as with the proposed Project, mitigation measures are identified to limit the cumulative contribution of noise from construction under Additional Housing Alternative B. Additional Housing Alternative B contribution to cumulative construction noise impacts would be reduced with mitigation, but not to a level that is less than significant for the reasons provided in the discussion of Impact 7A.11-2. This is the same finding as under the proposed Project.

> **Mitigation:** Implement Mitigation Measure 7B.11-1, *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors,* and Mitigation Measure 7B.11-2, *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*
>
> **Significance after Mitigation:** Significant and Unavoidable.

Impact 7B.11-7: Additional Housing Alternative B traffic in combination with traffic from cumulative development would not contribute considerably to cumulative noise impacts. (*Less than Significant*)

Long-term noise from cumulative development would primarily occur from motor vehicle traffic. When considered alone, development under Additional Housing Alternative B would generate noise mainly by adding more traffic to area roads and streets. Other anticipated projects would also contribute increased traffic volumes that would generate noise in the area. Any project that would individually have a significant project level noise impact would also be considered to have a significant cumulative noise impact.

A permanent noise increase of 3 dBA or 5 dBA or more in ambient noise levels in the vicinity above levels existing without Additional Housing Alternative B would be considered to generate a significant impact. Traffic noise levels at intersections most affected by traffic from buildout of Additional Housing Alternative B were modeled using the FHWA Traffic Noise Prediction Model and the turning movements for the existing conditions, Cumulative No Project (2035) and Cumulative plus Additional Housing Alternative B (2035) conditions. The segments analyzed and the results of the noise modeling are shown in Table 7B.11-3.

As shown in Table 7B.11-3, the increase in traffic noise between the Baseline (2018) and Cumulative Plus Project (2035) scenario would be no more than 2.0 dBA (less than the minimum 3 dBA threshold) at all analyzed roadway segments. Therefore, the cumulative traffic noise impact under Additional Housing Alternative B would be less than significant. This is the same finding as for the proposed Project.

Mitigation: None required.

Population and Housing[70]

Impact 7B.12-1: Additional Housing Alternative B would not directly induce substantial population growth by proposing new homes or businesses, and indirectly through the extension of infrastructure. (*Less than Significant*)

As noted in the proposed Project impact analysis, population and housing changes, in and of themselves, are not normally considered to be significant impacts (i.e., substantial, adverse impacts on the physical environment) under CEQA, but CEQA does allow inclusion of these effects as indicators of other impacts. More specifically, CEQA Guidelines section 15131 provides that social and economic effects may be considered to the extent that (1) they provide a linked connection between the proposed project and a physical environmental effect, or (2) they are useful in determining the significance of a physical environmental effect. The potential physical environmental impacts associated with changes in population and housing due to Additional Housing Alternative B are analyzed in other sections of this chapter (e.g., transportation, public services, air quality).

As shown in **Table 7B.12-1**, Additional Housing Alternative B would result in the same projected total/daily population growth as that which would occur under the proposed 2018 General Use Permit.

However, since this alternative would provide additional on campus housing to accommodate half the net increase in off-campus population that would occur under the proposed Project, the anticipated population that would reside on the Project site under this alternative would be greater than under the proposed Project.

The anticipated population that would reside on the Project site in 2035 is shown in Table 7B-3 in the Additional Housing Alternative B description. The increase in on-campus residential population associated with new housing that would be authorized under the proposed 2018 General Use Permit (6,326) combined with the increase in on-campus residential population associated with the additional on-campus housing proposed under this alternative (3,125), would result in a total increase in on-campus residential population of 9,451. The total on-campus residential population in 2035 under this alternative would be 24,789 compared to 21,664 under the proposed Project.

[70] The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives population and housing analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-PHD included in this document.

TABLE 7B.12-1
ANTICIPATED POPULATION GROWTH IN ALL POPULATION SEGMENTS UNDER ADDITIONAL HOUSING ALTERNATIVE B

Affiliation	2018 Population	2035 Population under Additional Housing Alternative B	Change in Population between 2018 and 2035
Undergraduate Students	7,085	8,785	1,700
Graduate Students, including PhDs	9,528	10,728	1,200
Postdoctoral Students[a]	2,403	3,364	961
Faculty[b]	3,073	3,862	789
On-Campus Staff [c]	8,985	11,423	2,438
Nonmatriculated Students[d]	977	1,397	420
Other Workers (total / daily based on commute frequency)[e]	9,166 / 5,321	11,267 / 6,395	2,101 / 1,074
Total / Daily	**41,217 / 37,372**	**50,827 / 45,955**	**9,610 / 8,583**

NOTES:
[a] Postdoctoral students are academics with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.
[b] Faculty refers to professorate faculty members and regular benefits-eligible employees in academic/instructor positions.
[c] Staff refer to regular benefits-eligible employees generally in non-academic positions. Refers only to staff working within the area governed by the General Use Permit.
[d] Non-matriculated students are students taking courses or engaged in graduate-level research or training but who are not seeking a degree.
[e] Other worker populations includes casual, contingent, and temporary employees; non-employee academic affiliates; and third party contractors including janitorial staff and construction workers.

SOURCE: Stanford University Land Use and Environmental Planning Office, in consultation with Stanford Office of Institutional Research and Decision Support

Additional Housing Alternative B assumes that Stanford would provide housing equal to half the increased housing demand generated by the proposed 2018 General Use Permit and that the additional demand would be met by constructing additional on-campus housing. Therefore, in addition to the proposed on-campus housing that would be provided under the proposed 2018 General Use Permit (3,150 units/beds), this alternative would also provide an additional 1,275 units/beds of on-campus housing, equivalent to half the net increase in off-campus housing demand that would occur under the proposed Project. Thus, Additional Housing Alternative B includes the provision of a total of 4,425 new on-campus housing units/beds.

As under the proposed 2018 General Use Permit, the growth of Stanford-affiliated population would result in an indirect housing demand beyond the Project site. However, the off-site housing demand under Additional Housing Alternative B would be slightly over half that of the proposed Project, or 1,251 off-site housing units. The estimated distribution of off-site housing in the Bay Area would be the same as the Project, and is likewise based on data from Stanford's 2016 Commute Survey. The household increase per jurisdiction attributable to Additional Housing Alternative B, relative to their respective projected growth from 2015 to 2040, would be about half that of the Project (shown in Table 5.12-11 in Section 5.12 in the Draft EIR). Thus, the off-site housing impacts associated with this alternative would be reduced compared to the proposed 2018 General Use Permit. It is assumed as well that Stanford would continue its contributions to the County-administered Stanford Affordable Housing fund to partially alleviate demand for affordable housing by Stanford affiliates. (Please note that, as described under Additional Housing Alternative B Description, Stanford could elect to, subject to approval by the County, to offset some

or all of the incremental off-campus housing demand by providing off-campus housing; the potential environmental consequences of that option are addressed in Impact 7B.17-1, below.)

Similar to the proposed Project, this alternative would accommodate construction of campus infrastructure improvements to support proposed growth, including, but not limited to, utilities and circulation improvements such as pathways, underground pipelines, electrical transmission lines, water supply infrastructure, habitat improvements, and other similar types of improvements. Although most infrastructure would be constructed on vacant land, infill sites, and redevelopment sites within the Academic Growth Boundary, some improvements could occur outside the Academic Growth Boundary. Similar to the proposed Project, development under Additional Housing Alternative B would include infrastructure improvements designed to accommodate Stanford's growth through 2035.

Based on the above analysis, similar to the proposed Project, Additional Housing Alternative B would not directly induce substantial population growth by proposing new homes or businesses, or indirectly through the extension of infrastructure, and the impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7B.12-2: Additional Housing Alternative B, in combination with past, present, and future projects would not result in substantial adverse cumulative population and housing impacts. (*Less than Significant*)

The geographic scope of potential population and housing impacts encompasses the Stanford lands within the proposed 2018 General Use Permit boundary as well as Bay Area communities that could be affected by population growth resulting from the Project.

Under this alternative, the total estimated direct increase in residential population within the Project site between 2018 and 2035 would be 9,451 people in 2035. As under the proposed Project, the construction of new off-site housing units would contribute to typical environmental impacts associated with housing development, although the number of new off-site households would be only slightly over half of that which would occur under the Project; and the contribution to the Bay Area's cumulative housing impact would likewise not be considerable. The impact would therefore be less than significant.

Mitigation: None required.

Public Services[71]

Construction Impacts

Impact 7B.13-1: Additional Housing Alternative B could increase demand for fire protection, emergency medical service and police protection services but would not result in an adverse physical impact from the construction of additional fire protection, emergency medical, or police protection facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. As a result, this alternative could result in additional demand for public services during construction. Similar to construction under the proposed 2018 General Use Permit, construction of individual projects under this alternative would result in temporary increases in vehicle congestion, delays and potential conflicts in the construction site vicinities and/or along construction haul routes; as well as the potential for construction worker accidents and medical emergencies at the construction sites, potentially requiring associated temporary increases in responses from public fire protection, EMS and/or police protection services to these incidents.

As under the proposed Project, all construction activities that would occur at construction sites under this alternative would be required to be conducted in compliance with applicable regulations, including Cal/OSHA standards and practices for worker safety, minimizing the need for public fire protection and emergency service response to worker accidents at construction sites. In addition, similar to mitigation identified for the proposed Project, Mitigation Measure 7B.15-1 under Transportation and Traffic, below, would ensure appropriate construction traffic control measures would be implemented for individual construction projects under this alternative to minimize on- and off-site construction traffic effects, and further minimizing potential construction traffic incidents requiring public fire, EMS and police response. As under the proposed Project, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s) and for communication and emergency dispatch services from the PAPD.

While construction would periodically occur over the duration of this alternative, construction activities in and of themselves would not generate a significant additional demand for public fire protection, EMS and/or police services that would require new or physically altered facilities. Therefore, similar to the proposed Project, Additional Housing Alternative B would generate a less-than-significant construction impact related to fire protection, EMS and police protection services. See also Impacts 7B.13-2 and 7B.13-3, below.

[71] The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives student generation analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-SCH included in this document.

Mitigation: None required.

Operational Impacts

Impact 7B.13-2: Operation of uses under Additional Housing Alternative B would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional fire protection facility in order to maintain acceptable performance standards. (*Less than Significant*)

Additional Housing Alternative B would increase housing development on the Project site, and associated residential population, above that proposed by the 2018 General Use Permit, and thus, would increase demand for public fire protection and EMS services beyond that generated by the Project. As under the proposed Project, the increase in development and population under this alternative would occur within existing urbanized areas of the campus, and consequently, would be served by the existing on-campus Fire Station 6. As discussed in Section 5.13 of the Draft EIR, Stanford DPS is relocating to the planned Public Safety Building and Departmental Operations Center in Stanford's Bonair Corporation Yard, which will in turn serve to provide additional operational space for PAFD or another provider at Fire Station 6 to use, if needed.

Similar to the proposed Project, this alternative would allow for authorization of expanded or new academic support development, which could include additional on-campus fire protection/EMS facilities, if needed to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under this alternative are addressed throughout the analysis for other environmental topics presented for this alternative.

As with the proposed Project, under this alternative, Stanford would pay the City of Palo Alto [or other qualified fire protection/EMS service provider(s) should Stanford contract with another qualified entity(ies)] a fair share contribution annually for fire protection/EMS services from the service provider(s). The City of Palo Alto and Stanford are currently under a five-year contract for PAFD to provide fire protection and EMS services to Stanford.

Similar to the proposed Project, new development that would occur on the Project site under this alternative would require fire and life safety code compliance, provided by the Stanford University Fire Marshal's Office (SUFMO). As under the proposed Project, as new individual developments are proposed under this alternative, the SUFMO would review building plans to ensure the project provides for adequate compliance with fire code requirements.

Given these factors, increases in development on the Project site, and increase in residential and commuter population under this alternative would increase demand for fire protection and emergency medical services, however, would not result in an adverse physical impact from the construction of additional fire protection or emergency medical service facilities. Therefore, similar to the proposed Project, operation of this alternative would generate a less-than-significant impact related to fire protection and EMS services.

Mitigation: None required.

Impact 7B.13-3: Operation of development under the proposed Additional Housing Alternative B would increase demand for police protection services. (*Less than Significant*)

Additional Housing Alternative B would increase housing development on the Project site, and associated residential population, above that proposed by the 2018 General Use Permit, and thus, would increase demand for police protection services beyond that generated by the Project. As discussed in Section 5.13 in the Draft EIR, the Stanford DPS will be relocating on-campus to the planned Public Safety Building and Departmental Operations Center. As under the proposed Project, this facility would provide adequate space for Stanford DPS to operate throughout the life of this alternative.

Similar to the proposed Project, this alternative would also allow for new and/or expanded academic support development, which could include additional Stanford DPS facilities, if needed, to serve the campus population in the future. All potential environmental effects associated with construction and operation of academic support development that would occur under this alternative are addressed throughout the analysis for other environmental topics presented for this alternative.

As with the proposed Project, under this alternative, Stanford would pay the City of Palo Alto a fair share contribution annually as compensation for the communication and emergency dispatch services it would receive from the PAPD.

As discussed in Section 5.13 in the Draft EIR, the City of Palo Alto is also planning a new Public Services Building (expected to be operational in 2021) that would house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City.

Given these factors, increases in development on the Project site and increase in resident and commuter population under this alternative would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional police protection facilities. Therefore, similar to the proposed Project, operation of this alternative would generate a less-than-significant impact to police protection services.

Mitigation: None required.

Impact 7B.13-4: Additional Housing Alternative B would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

Additional Housing Alternative B would increase residential development and the associated residential population on the campus compared to the proposed 2018 General Use Permit.

Therefore, this alternative would increase on-campus school-aged children that would be served by PAUSD over that which would be generated by the proposed Project.

This analysis uses student generation rates based on children per household to estimate the number of school-age children that would be generated as a result of increased campus population under this alternative. Similar to the proposed Project, rates of 0.23 for elementary school, 0.12 for middle school, and 0.15 for high school were used for this alternative, for a total student generation rate of 0.50. These student generation rates used are consistent with the moderate student generation rates used by PAUSD's demographer, DecisionInsite, in its Fall 2016 Residential Research Summary Report.[72] The additional on-campus housing that would be developed under this alternative would be multi-family units, similar to that analyzed for the proposed Project; and consequently, the multi-family student generation rates would remain applicable.[73]

Table 7B.13-1 summarizes the estimated enrollment in PAUSD schools from students generated under this alternative. Under this alternative, 1,721 new faculty/staff housing units (an increase of 1,171 units over the proposed Project) would be constructed on-campus that could be occupied by faculty and staff, including postdoctoral students and medical residents, and/or other workers. Application of the student generation ratios to the 1,721 new units results in an estimated increase of 861 additional school-age children (586 more school-age children than the proposed Project). As shown in Table 7B.13-1, similar to the proposed Project, the addition of school-age students to the PAUSD would be diffused over various grade levels and schools. As under the proposed Project, since buildout of this alternative, including new residential units, would occur incrementally over an approximate 17-year span, the school-age students generated by this alternative that would be added to PAUSD schools would also occur incrementally over this span.

TABLE 7B.13-1
ESTIMATED PAUSD ENROLLMENT FROM STANFORD 2018 GENERAL USE PERMIT FOR ADDITIONAL HOUSING ALTERNATIVE B

Schools	Increase in Number of Units	Student Generation Rates[a]	Estimated Number of Students
Elementary	1,721	0.23	396
Middle School	1,721	0.12	207
High School	1,721	0.15	258
Total		**0.50**	**861**

NOTE:
[a] Student generation rates from PAUSD, *Residential Research Summary,* Fall 2016 prepared by DecisionInsite, November 2016.

[72] These rates are also consistent with the rates considered in the Comprehensive Plan Update Final EIR for the City of Palo Alto (City of Palo Alto, 2017b).

[73] It should be noted that PAUSD has since completed a Winter 2018 Residential Research Summary Report that presents higher multi-family student generation rate for the moderate scenario (0.66) than from its prior report (PAUSD, 2018a). However, data provided by Stanford of its existing faculty/staff multi-family housing on and near the campus yields a student generation rate of no more than 0.38. Consequently, the continued use of a total student yield rate of 0.5 students/unit for the Project and housing alternatives is considered conservative.

As described in the Draft EIR Section 5.13, currently PAUSD middle school enrollment exceeds PAUSD middle school capacity, whereas PAUSD elementary and high school enrollment are within PAUSD capacity. However, the PAUSD projected a decline in both its elementary and middle school student enrollment through its planning horizon of 2026/27. In addition, while PAUSD projected a near-term increase in its high school enrollment until 2020, it projected a decline in its high school enrollment thereafter through 2026/27. More recent PAUSD enrollment projections through school year 2022/23 indicate similar near-term enrollment trends, with the exception of PAUSD elementary school enrollment, which under the moderate projection may experience up to a six percent increase over the next five years (PAUSD, 2018b). The overall long-term projected decline in PAUSD enrollment could serve to lessen the effect of Project-generated school-age children that would attend PAUSD schools on student capacity.

Consistent with the analysis for the proposed Project in Section 5.13 of the Draft EIR, if conservatively assuming that all of the students generated under Additional Housing Alternative B would be added to the PAUSD schools prior to PAUSD's planning horizon of 2026/27, when considering the existing student capacities of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27 planning horizon, similar to the proposed Project there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated students added by this alternative in 2026/27.

On the other hand, if considering an even more conservative scenario that the entire increase in students generated under Additional Housing Alternative B would be added to the PAUSD schools prior to its current shorter planning horizon of 2022/23, and using the more recent PAUSD enrollment projections which show higher near-term enrollment, this alternative would result in exceedances in capacity of PAUSD elementary, middle and high schools. However, these results are unlikely because as discussed above, in actuality, the development of new on-campus residential units under this alternative, and thus, the increase in school-age students generated by this alternative that would be added to PAUSD schools, would not all be concentrated within the first five years of the general use permit, but rather, would occur incrementally over an approximate 17-year span between 2018 and 2035.

In any case, even if school enrollment were to increase such that more school capacity is needed, PAUSD would have multiple options to explore before building a new school. In addition to reactivating existing school sites owned by PAUSD, such as Cubberley, Greendell and Garfield, the PAUSD also has several school properties currently leased to private school providers, such as Athena Academy, and Pinewood School. PAUSD also maintains an agreement with the City of Palo Alto that allows PAUSD the right to repurchase the Ventura site for educational purposes. PAUSD could also take advantage of schools that may be operating below capacity by redrawing lines designating which neighborhoods attend a given school or by adding modular classrooms. Given these circumstances, construction of a new school appears to be speculative even with the increases in student generation that could occur under this alternative. In the event any PAUSD school expansion occurs, PAUSD would be required to undergo site-specific environmental review, as appropriate, prior to consideration of approval by the PAUSD.

Pursuant to California Government Code Sections 65995.5 through 65997, and related impact fees established by the PAUSD, school impact fees are charged for new residential and commercial development that would be developed by Stanford under this alternative. Pursuant to Government Code section 65997, payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with this alternative.

When considering all the above factors, while Additional Housing Alternative B would increase enrollment in local public schools, this alternative would not result in adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards.

Mitigation: None required.

Cumulative Impacts

Impact 7B.13-5: Implementation of Additional Housing Alternative B in combination with past, present, and reasonably foreseeable projects, would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

This section analyzes potential impacts to fire protection services that could occur from this alternative in combination with reasonably foreseeable growth in the PAFD service area. As discussed in the Environmental Setting, the PAFD service area includes the jurisdictional boundaries of Palo Alto in addition to some of the unincorporated land surrounding the city limits, including the Project site.

As discussed in Impacts 7B.13-1 and 7B.13-2, above, the alternative's impact to PAFD's fire protection and EMS services is determined to be less than significant. Sufficient fire protection facilities would exist on campus to the serve additional development and population under this alternative. Furthermore, under this alternative, Stanford would pay the City of Palo Alto a fair share contribution annually for fire protection services from the PAFD.

The City of Palo City is implementing a number of improvements to PAFD fire station facilities in its City, including improvements to Fire Station 1 by 2019, replacement of Fire Station 3 by 2019, and a planned replacement of Fire Station 4 by 2020. As discussed for the Project, PAFD indicates with these planned improvements, the PAFD can adequately serve the increased demand from increased growth and buildout of the City. Annual City reviews and monitoring of fire department services and performance metrics (including response times) that is conducted by the City would help to ensure that the PAFD would continue to adequately meet the demands of the city and accommodate growth not only by this alternative but from throughout the city.

Therefore, the cumulative impact under this alternative would be less than significant.

Mitigation: None required.

Impact 7B.13-6: Development of Additional Housing Alternative B in combination with past, present, and reasonably foreseeable projects would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards. (*Less than Significant*)

Cumulative impacts are considered in the context of the growth and development under the alternative as they are within the service area of Stanford DPS, as well as that of the PAPD and the Santa Clara County Sheriff's Department.

As discussed in Impacts 7B.13-1 and 7B.13-3, above, the alternative's impact on police protection services, including Stanford DPS, PAPD and the Santa Clara County Sheriff's Department, is determined to be less than significant. Stanford DPS is relocating on-campus to its planned Public Safety Building and Departmental Operations Center which will provide adequate space for Stanford DPS to operate under this alternative. In addition, the City of Palo Alto planned new PSB will house the PAPD, as well as its emergency dispatch center and other services, and will accommodate existing and future police and emergency planning facility needs of the City. Additionally, annual City reviews and monitoring of law enforcement services and performance metrics (including dispatch response times) that is conducted by the City of Palo Alto would help to ensure that the PAPD would continue to adequately meet the demands of the city and are able to accommodate growth not only by this alternative but from throughout the city.

Therefore, implementation of this alternative in combination with past, present, and reasonably foreseeable projects would have a less-than-significant cumulative effect with respect to police protection services.

Mitigation: None required.

Impact 7B.13-7: Development of Additional Housing Alternative B in combination with past, present, and reasonably foreseeable projects would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards. (*Less than Significant*)

This section analyzes potential impacts related to schools that could occur from implementation of this alternative in combination with reasonably foreseeable growth in PAUSD's service area. Cumulative development within the PAUSD service area would generate new students to PAUSD, which could result in the need for new or expanded school facilities.

As discussed in Impact 7B.13-4, above, when conservatively considering the existing student capacity of PAUSD schools and the declining PAUSD enrollment forecasts through its 2026/27

planning horizon, there would be sufficient remaining capacity in PAUSD elementary, middle and high school categories to accommodate all the estimated added students generated by this alternative in 2026/27. Impact 7B.13-4 also acknowledges that in an even more conservative scenario that the entire increase in students generated under Additional Housing Alternative B would be added to the PAUSD schools prior to its current shorter planning horizon of 2022/23, this alternative would result in exceedances in capacity of PAUSD schools; although, these results are unlikely given that new on-campus residential uses under alternative would be developed incrementally over an approximate 17-year span under the new general use permit. Nonetheless, Impact 7B.13-4 describes multiple options available to PAUSD to explore to increase school capacity if needed. Impact 7B.13-4 also discusses that Stanford's payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with the proposed alternative.

The City of Palo Alto recently completed environmental review for, and adopted an update to, its Comprehensive Plan, which considered a range of future growth scenarios. The selection of the preferred scenario by the City would result in 3,545 to 4,420 new housing units in the City that could generate between 1,773 and 3,632 new students. The Final EIR for the update to the Comprehensive Plan determined that this range of anticipated student growth would result in an exceedance of existing PAUSD capacity for its elementary, middle and high schools. The PAUSD is responsible for updating it enrollment forecasts as needed, including any increases that would be associated with growth under the City's Comprehensive Plan. However, the additional student growth under Additional Housing Alternative B combined with the cumulative growth anticipated under the Comprehensive Plan would result in a cumulative increase to enrollment of public schools within the PAUSD service area. As with the Additional Housing Alternative B, all other cumulative projects within the PAUSD service area would also be subject to the school development fees.

It is unknown where or how school facilities would be expanded to accommodate future students. It would therefore be speculative to analyze the impacts of potential future school construction projects in this EIR. As noted above under Impact 7.A.13-4, even if school enrollment were to increase such that more school capacity is needed, PAUSD would have multiple options to explore before building a new school. In addition to reactivating existing school sites owned by PAUSD, such as Cubberley, Greendell and Garfield, the PAUSD also has several school properties currently leased to private school providers, such as Athena Academy, and Pinewood School. PAUSD also maintains an agreement with the City of Palo Alto that allows PAUSD the right to repurchase the Ventura site for educational purposes. PAUSD could also take advantage of schools that may be operating below capacity by redrawing lines designating which neighborhoods attend a given school or by adding modular classrooms, and/or developing two-story facilities. The PAUSD is currently preparing its 2018 Facilities Master Plan. As part of the development of the plan, the PAUSD is in the process of defining districtwide standards, and considering infrastructure needs at each of its school sites. The PAUSD Board is considering placing a bond measure on the November 2018, March 2020, or November 2020 ballot to provide funding for the next 20 years of PAUSD facilities improvements. Given these circumstances, construction of a new school appears to be speculative even with the increases in student generation that could occur under this alternative. Further, if it is determined that additional

school facilities are needed as growth occurs, expansion and/or construction would be subject to separate environmental review, thereby providing an opportunity to identify and mitigate associated environmental impacts.

Therefore, Additional Housing Alternative B's contribution to cumulative impacts related to school facilities would be less than significant.

Mitigation: None required.

Recreation[74]

Approach to Analysis

On-Campus Impacts

Consistent with the analysis prepared for the proposed Project, this alternative analysis also considers the number of all on-campus residents anticipated under Additional Housing Alternative B compared to the total acreage of designated Campus Open Space lands to determine whether there would be at least five acres of designated Campus Open Space per 1,000 campus residents.[75]

Off-Campus Impacts

Similar to the approach used to consider off-campus impacts to parks and recreation facilities for the proposed Project, the analysis of Additional Housing Alternative B considers the neighboring public park and recreation facilities used by Stanford's residential population and the potential that an increase in use of off-site facilities under this alternative could contribute to substantial deterioration of those facilities.

Consistent with the approach used to analyze the proposed Project, a combined daily visit generation rate is used for faculty, staff and postdoctoral students to estimate the potential increase in visits to public park and recreation facilities identified in Palo Alto and Menlo Park. This data relies on visit generation rates calculated from a campus-wide survey conducted in 2016. Where other Workers are included in the on-campus resident population under this alternative, their household size and park usage behavior are assumed to be the same as that of faculty, staff and postdoctoral students. Similar to that assumed for the proposed Project, this analysis also assumes that spouses and dependents would have the same behavior as the primary affiliate.

Similar to the analysis of the proposed Project, Stanford also conducted a sensitivity analysis that conservatively considered the additive effect of any incidental use of nearby parks and recreation facilities associated with an increase in Stanford commuters that would occur under the alternative.

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74 The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives park and recreation facilities analysis prepared by Stanford and independently peer reviewed by ESA; see Appendix ALT-REC included in this document.

75 Campus residents include all residents on Stanford lands within the General Use Permit boundary, including students, faculty, staff, postdoctoral students and other workers. The resident population estimates also include the spouses and children of the population living on the campus.

Using the same screening criteria as that used for the proposed Project, if growth in on-campus residents under this alternative is found to result in more than 12.5 daily visits per acre at a particular public park or recreation facility, additional site specific analysis would be performed to determine whether the increase in visitors might require replacement of turf or other recreation facilities substantially in advance of their expected life cycles. Alternately, an increase of less than 12.5 daily visits per acre at a particular park or recreation facility would indicate that substantial deterioration from increased use by campus residents would be highly unlikely, and no additional analysis would be necessary.

Construction and Operational Impacts

Impact 7B.14-1: Additional Housing Alternative B would increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Significant*)

Additional Housing Alternative B would result in a greater on-campus residential population compared to the proposed Project, and consequently, would create a greater demand for, and use of, on- and off-campus park and recreational facilities than the proposed Project.

On-Campus Park and Recreational Facility Deterioration

It is assumed that under this alternative, the location and amount of land designated as Campus Open Space in the Stanford Community Plan on the Project site would not change from baseline conditions. **Table 7B.14-1**, below, demonstrates that, with an estimated ratio of 10.7 acres of designated Campus Open Space per 1,000 campus residents, the lands designated Campus Open Space on the Project site would provide adequate space to support the estimated campus residents under this alternative. The ratio provided under this alternative would be less than that provided under the proposed Project (12.2 acres of designated Campus Open Space per 1,000 campus residents), however would still be well more than the minimum of five acres of designated Campus Open Space per 1,000 campus residents. Similar to the conclusion reached for the proposed Project, based on the availability of Campus Open Space, the increased residents under this alternative would not result in overuse that could lead to substantial degradation of parks and recreation facilities and would not create a need for construction of new onsite park, recreation and open space facilities.

TABLE 7B.14-1
STANFORD CAMPUS OPEN SPACE ACREAGE PER RESIDENT - ADDITIONAL HOUSING ALTERNATIVE B

	Fall 2018	Fall 2035 (with buildout of Additional Housing Alternative B)
Campus resident population	15,338	24,789
Designated Campus Open Space (approximate)	265	265
Ratio (acres per 1,000 residents, approximate)	17.3	10.7

SOURCE: Stanford, 2018 (see Appendix ALT-REC)

Off-Campus Park and Recreational Facility Deterioration

Table 7B.14-2 presents the estimated increase in usage in public park and recreation facilities in Palo Alto and Menlo Park by campus residents under Additional Housing Alternative B.

TABLE 7B.14-2
ESTIMATED INCREASE IN USAGE IN PUBLIC PARK AND RECREATION FACILITIES BY ON-CAMPUS RESIDENTS UNDER ADDITIONAL HOUSING ALTERNATIVE B

Figure[a] Reference	Name	Acres[b]	Growth in Daily Visits	Daily[c] Visits per Acre
PALO ALTO				
Regional/District Parks				
1	Foothills Park/Open Space Preserve	Total 1,400; Active 26.7	107	0.1; 4.0
2	Baylands Nature Preserve	Total 1,940; Active 9.2	86	0.0; 9.3
3	Pearson-Arastradero Preserve	Total 622; Active 6.2	67	0.1; 10.8
Neighborhood Parks and Recreation Facilities				
4	Neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks)	4.4	101	23.0
5	Mayfield (Stanford-Palo Alto) playing fields	5.9	40	6.8
6	El Camino Park	12.2	38	3.1
7	Baylands Athletic Center fields	10.0	17	1.7
8	Heritage Park	2.01	17	8.5
9	Rinconada Pool	NA	11	NA
10	Mitchell Park	21.4	9	0.4
11	Peers Park	4.7	16	3.4
12	Lawn Bowling Green	1.9	3	1.6
13	Avenidas Senior Center	NA	4	NA
14	Cubberley Community Center	NA	12	NA
MENLO PARK				
Regional/District Parks				
15	Bedwell Bayfront Park	Total 160; Active 7.0	3	0.0; 0.3
Neighborhood Park and Recreation Facilities				
16	Civic Center recreation facilities	9.3	33	3.5
17	Stanford Hills Park	3.1	28	9.0
18	Sharon Park	9.8	8	0.8
19	Sharon Hills Park	11.5	8	0.7
20	Nealon Park	9.0	6	0.7
21	Jack W. Lyle Park	4.6	5	1.1

NOTES:
[a] Figure references are associated with recreation facilities shown on Figure 5.14-2 in the Draft EIR.
[b] Acreages of all parks were obtained from Palo Alto or Menlo Park City websites and documents, except for Sharon Hills Park, which was calculated by Stanford. Please see Appendix REC in the Draft EIR for calculations on "actively used" park areas for regional/district parks.
[c] Resulting daily visits per acre is calculated based on the total of growth in daily visits under the housing alternative, which includes the growth in campus residents under the proposed Project plus the additional growth assumed for the Additional Housing Alternative B.

SOURCE: Stanford, 2018 (see Appendix ALT-REC)

As shown in Table 7B.14-2, the increase in on-campus residents anticipated to occur under Additional Housing Alternative B would cause one neighborhood park (College Terrace parks) to experience an increase of visits over the screening threshold of 12.5 daily visits per acre. In addition, the sensitivity analysis conducted for Additional Housing Alternative B showed that with the inclusion of commuters in the analysis, Additional Housing Alternative B would also exceed the screening criteria at the Pearson-Arastradero Preserve in Palo Alto. In comparison, under the proposed Project, no public parks would experience an increase over the screening threshold.

Following the approach to analysis described above, the next step was to consider whether the increase in visitors (exceeding 12.5 per acre per day) might require replacement of turf or other recreation facilities substantially in advance of their expected life cycles. Because there are turf areas identified at the neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks), in Palo Alto, additional study is required to determine monitoring.

The neighborhood parks in College Terrace do not have a reservation system in place to ensure adequate recovery time for the turf areas, therefore impacts to turf areas at these parks under Additional Housing Alternative B could be significant. Over the long term, cities plan for future turf replacement on a schedule that is needed to accommodate observed increases in park usage. However, the relatively large increase in turf usage that could occur under this alternative could necessitate an initial turf replacement more quickly than might have been planned. Because turf has a natural life, and must be replaced from time to time regardless of the increase in use caused by this alternative, a one-time turf replacement could offset the impact associated with possible acceleration of turf replacement. Therefore, mitigation for increased or accelerated physical deterioration to the turf areas due to implementation of this alternative would take the form of a contribution toward one-time turf replacement at these parks as included below.

Conclusion

Similar to the proposed Project, Stanford is expected to provide adequate on-campus sports, fitness and recreation facilities for faculty, staff and students under Additional Housing Alternative B. As under the proposed Project, new and expanded indoor recreation facilities would be authorized as needed as part of the academic and academic support space authorized by the General Use Permit for this alternative.

There are no turf areas at the Pearson-Arastradero Preserve in Palo Alto. The calculation of active areas at this park was based on the length and average width of trails, mostly paved trails.[76] However, increased visits to the trail system would not necessarily result in accelerated deterioration of the trails. According to research by the National Park Service, human-powered trail activities effectively have a minimal degradation on unsurfaced trails.[77] Therefore, the potential degradation of paved trails by an increased number of visitors at the Pearson-Arastradero Preserve is minimal, and no further analysis to this park is necessary.

[76] The calculation of turf areas and active areas is documented on Pages 16.73 and 16.74 of Appendix REC of the Draft EIR.

[77] Marion and Olive, 2006. *Assessing and Understanding Trail Degradation: Results from Big South Fork National River and Recreational Area*. Retrieved from California Department of Parks and Recreation: https://www.parks.ca.gov/pages/1324/files/f10602%20marion&olive.pdf.

However, as discussed above, the increase in campus residents anticipated to occur under the Additional Housing Alternative B would result in an increase in off-campus public park visits resulting in a significant impact to turfs at College Terrace parks. Project impacts related to deterioration of recreation facilities generated by this alternative would be offset with implementation of **Mitigation Measure 7B.14-1**, and thus, this impact would be reduced to less than significant with mitigation. Impacts related to deterioration of recreation facilities generated by Additional Housing Alternative B would be offset with implementation of **Mitigation Measure 7B.14-1**, and thus, this impact would be reduced to less than significant with mitigation.

Furthermore, similar to the voluntary improvement measure identified for the proposed Project, Improvement Measure 7B.14-1 identified for this alternative would provide for park upgrade funds at the four College Terrace parks to ensure these parks remain in good condition.

> **Mitigation Measure 7B.14-1:** Prior to occupancy of net new on-campus housing units exceeding 3,150, Stanford shall provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs to provide for one-time turf replacement at neighborhood parks in College Terrace (Cameron, Mayfield, Weisshaar, and Werry Parks). The amount of the contribution shall be determined by the County of Santa Clara based on an estimate from an independent contractor. The payment shall not be used for any purpose other than turf replacement at College Terrace parks.
>
> **Significance after Mitigation:** Less than Significant.
>
> **Improvement Measure 7B.14-1:** Stanford has proposed to provide to the City of Palo Alto a one-time contribution equivalent to the capital budget needs previously identified by the City of Palo Alto (approximately $300,000) to provide for planned park upgrades and ensure that the four College Terrace parks remain in good condition. These improvements identified in the Palo Alto Capital Budget were as follows:
>
> - Tennis court upgrade ($215,000 planned for both Terman Park and Weisshaar Park, this good-neighbor offer assumes $140,000 is for Weisshaar Park), planned for FY 2021.
> - Planned infrastructure improvements to upgrade and renovate safety and accessibility of the playground and other features in Cameron Park, approximately $160,000, planned for FY 2020.

Impact 7B.14-2: The construction of recreational facilities under Additional Housing Alternative B would cause physical effects on the environment. (*Significant*)

As with the proposed 2018 General Use Permit, under Additional Housing Alternative B Stanford would likely relocate or replace some of its existing campus recreation facilities, and would use a portion of authorized net new academic and academic support square footage for new or expanded athletic and recreation facilities. Under this alternative, the placement of additional housing at the edges of the West Campus and DAPER and Administrative Development Districts could require development of lands that are currently used for existing recreation fields, which could, in turn, need to be relocated elsewhere on the campus.

Similar to the proposed Project, the creation of new open spaces and construction of recreational amenities on the Project site would result in physical effects. These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. As with the proposed Project, since on-campus recreational improvements are part of the overall anticipated development program under the alternative, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses above, including Section 7A.2 Air Quality, 7A.3 Biological Resources, 7A.4, Cultural Resources, 7A.8 Hazardous Materials, 7A.9 Hydrology and Water Quality, 7A.11 Noise and Vibration, and 7A.15 Transportation and Traffic. Similar to those mitigation measures identified for the proposed Project, the mitigation measures outlined in these respective topics for this alternative to reduce construction related impacts would similarly apply to on-campus park and recreation facility development.

Mitigation: Implement the following mitigation measures, as needed for construction of recreation facilities:

Air Quality

Mitigation Measure 7B.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 7B.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 7B.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 7B.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 7B.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 7B.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 7B.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 7B.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 7B.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 7B.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 7B.3-11(a)-(c): *Mitigation for protected trees during construction.*

Cultural Resources

Mitigation Measure 7B.4-2(a)-(b): *Mitigation for protection of archaeological resources during construction.*

Mitigation Measure 7B.4-3: *Mitigation for protection of paleontological resources during construction.*

Hazardous Materials

Mitigation Measure 7B.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 7B.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 7B.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 7B.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 7B.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 7B.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact 7B.14-3: Additional Housing Alternative B in combination with past, present, and reasonably foreseeable future projects would increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Significant*)

The geographic area for the cumulative analysis of public park and recreation facilities is focused on facilities on campus and those within three miles of the Project site. The increased demand by the Project on public park and recreation facilities (as identified under Impact 7B.14-1 above), would be coupled with that generated by the increased populations of the cities of Menlo Park and Palo Alto. Under its Comprehensive Plan Update, the City of Palo Alto considered its local City and sphere of influence population increase from 2014 to 2030 to range from 92,045 to 94,06, which correlates to an increase of 13 to 16 percent. Palo Alto's Comprehensive Plan Update Final EIR considers this population increase and concluded that cumulative impacts to parks and recreation facilities would be less that significant through compliance with the City's Municipal Code which would ensure that in-lieu fees and impact fees are collected for the creation of new or physically altered parks and recreational facilities to the extent feasible, and

with implementation of mitigation to evaluate and mitigate the construction impacts associated with park and recreational facility creation and expansion (City of Palo Alto, 2017b). Similarly, the City of Menlo Park's 2016 update of its Land Use Element identified a 24-year population growth of nearly 53 percent by 2040. Evaluation of cumulative impacts to parks also concluded that conformity with General Plan goals and polices would ensure that adequate parklands and recreational facilities would be provided (City of Menlo Park, 2016).

Ultimately, while there is expected to be a cumulative population increase in the Project area, this growth is not expected to generate a cumulative significant impact to park and recreation facilities with the use of established municipal fee structures of the local jurisdictions. However, because the neighboring plans do not include assumptions of growth under Additional Housing Alternative B, the deterioration of off-campus park and recreation facilities at Pearson-Arastradero Preserve and the College Terrace parks from this alternative would contribute significantly to a cumulative recreation impact. Implementation of Mitigation Measure 7B.14-1, for a one-time turf replacement at the College Terrace parks, would reduce Stanford's contribution to a cumulative impact. The potential degradation of paved trails by an increased number of visitors at Pearson-Arastradero Preserve is minimal, and no further mitigation for these parks are necessary. Given all these factors, the cumulatively considerable impact identified to park and recreation facilities would be less than significant with mitigation.

Similar to the improvement measure identified for the proposed Project, implementation of Improvement Measure 7B.14-1 to provide for park upgrade funds at the four College Terrace parks to ensure these parks remain in good condition would further reduce Stanford's contribution to a cumulative impact.

Mitigation: Implement Mitigation Measure 7B-14.1.

Significance after Mitigation: Less than Significant.

Improvement Measure: Implement Improvement Measure 7B.14-1.

Transportation and Traffic[78]

Approach to Analysis

Vehicle Trip Generation

The trip generation was estimated for Additional Housing Alternative B using the same Stanford resident and commuter peak hour trip generation rates used for the proposed Project. It should be noted that the commuter trip generation rate is the average rate per Stanford commuter, which accounts for the fact that only a portion of the commuters drive to campus.

78 The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives transportation impact analysis and VMT analyses prepared by Fehr & Peers Transportation Consultants for Stanford and independently peer reviewed by ESA; see Appendices ALT-TIA and ALT-VMT included in this document.

Table 7B.15-1 identifies the trip generation rates for campus commuters, campus residents living in student housing, and campus residents living in faculty/staff housing. A campus commuter is a Stanford affiliate who lives off campus. At Stanford, many commuters travel to the campus by taking public transit (Caltrain and buses) and/or Marguerite shuttles, bicycling, walking, vanpooling or carpooling. As a result, the vehicle trip generation rates for campus commuters are low. Table 7B.15-1 shows that in the morning peak hour, campus commuters generate 0.096 inbound trips per commuter and 0.041 outbound trips per commuter for a total of 0.137 morning peak hour trips per campus commuter. In the evening peak hour, campus commuters generate 0.084 inbound trips per commuter and 0.135 outbound trips per commuter for a total of 0.143 evening peak hour trips per campus commuter.

TABLE 7B.15-1
2018 GENERAL USE PERMIT VEHICLE TRIP GENERATION ESTIMATE

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Commuter (trips/Stanford affiliate living off campus)	0.096	0.041	0.137	0.051	0.084	0.135
Student Resident (trips/bed)	0.028	0.037	0.065	0.077	0.066	0.143
Faculty/Staff Resident (trips/unit)	0.150	0.280	0.430	0.260	0.190	0.450

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Table 7B.15-1 shows that the vehicle trip generation rates measured for on-campus faculty/staff housing units are higher than the trip generation rates for campus computers in both the inbound and outbound directions in both the morning and evening peak hours. The residential rates are the measured trip generation rates on a per-bed or per-unit basis at Stanford student and faculty/staff housing sites. Residential rates include trips by Stanford affiliates as well as spouses and other household members. A campus resident travels between the campus and other destinations for a variety of purposes, including shopping, dining out, religion, clubs and activities, recreation and exercise, entertainment, socializing, daycare, school, and off-campus employment. These types of trips can generate both outbound and inbound trips during the morning or evening periods. Faculty/staff housing units can also house non-Stanford affiliates as well as Stanford affiliates. In addition, many of the residence-based trips are not as amenable to transit and other modes as commute trips such as vanpools. In the morning peak hour, on-campus faculty/staff housing residential units generate 0.150 inbound trips per unit and 0.280 outbound trips per unit for a total of 0.430 morning peak hour trips per faculty/staff residential unit. In the evening peak hour, on-campus faculty/staff residential units generate 0.260 inbound trips per unit and 0.190 outbound trips per unit for a total of 0.450 evening peak hour trips per residential unit.

Under Additional Housing Alternative B, 1,171 more faculty/staff units are assumed to be constructed on the campus, as compared to the proposed 2018 General Use Permit. These units would reduce the population that otherwise would commute to the campus under Project conditions by 1,171 individuals. Therefore, the trip generation estimation process starts by subtracting from Project conditions the commuters who would no longer commute to campus by multiplying 1,171 by the commuter trip generation rate and showing that result as a negative

number. The trips associated with 1,171 new faculty/staff housing units are then added to that number to generate a net change in faculty/staff trips compared to Project conditions. The same process was used for the 105 graduate students who are assumed to be housed in new graduate student beds (incorporating a factor for two-student couples).

Table 7B.15-2 presents the trip generation for the proposed Project, for reference, and **Table 7B.15-3** summarizes the residential trips added, commute trips eliminated, and the net change for this alternative.

TABLE 7B.15-2
2018 GENERAL USE PERMIT VEHICLE TRIP GENERATION ESTIMATE

	AM Peak Hour			PM Peak Hour		
Generator	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Total Campus Trips (based on academic space growth)	**751**	**428**	**1,179**	**600**	**779**	**1,379**
Residents	153	250	403	343	277	620
Non-Residential Generators (Commuters, visitors, others)	598	178	776	257	502	759

SOURCE: Fehr & Peers, August 2017 (see Draft EIR Appendix TIA)

TABLE 7B.15-3
ADDITIONAL HOUSING ALTERNATIVE B TRIP GENERATION ESTIMATE
(COMPARED TO PROPOSED 2018 GENERAL USE PERMIT)

	AM Peak Hour			PM Peak Hour		
Trip Type	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Resident Trips Added	179	332	510	313	229	542
Commuter Trips Eliminated	(122)	(536)	(175)	(65)	(107)	(172)
Net Change Compared to Project	56	279	335	247	123	370

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Compared to the proposed Project, Additional Housing Alternative B would generate a net increase in vehicle trips entering and leaving campus during the peak hours, due to the higher vehicle trip generating characteristics of faculty/staff residential units as compared to Stanford commuters. These trips would be in addition to those of the proposed Project. The faculty/staff residential units could house singles, couples and families, generating the full range of housing-related trips by vehicle and other modes. As explained above, faculty/staff residential units generate both inbound and outbound vehicle trips during the morning and evening peak periods. The residential trips would have a different distribution than the commuter trips, as described below.

Vehicle Trip Distribution

The commuter and resident trip distribution patterns for Additional Housing Alternative B are the same as for the proposed project. The commuter distribution is based on Stanford off-campus

resident locations, and the resident distribution is based on census data for the census tracts including the Stanford campus residential areas. These distribution patterns were used to distribute and assign the commuter trip reductions and residential bed/unit trip additions to the roadway network. In summary, Additional Housing Alternative B would contribute more trips to the local area when compared to the proposed Project.

Construction Impacts

Impact 7B.15-1: Additional Housing Alternative B would generate construction traffic that would cause a substantial reduction in mobility and in access to land uses. (*Significant*)

Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, and therefore, would involve more construction than would occur under the proposed Project. Consequently, Additional Housing Alternative B would generate more construction traffic than would occur under the proposed Project. Similar to the proposed Project, impacts could include reduction in off-campus on-street parking; reduction in pedestrian, bicycle and public transit access; additional peak-hour traffic; use of non-truck routes by construction traffic; and interference with special events. These impacts would be significant.

Implementation of the following mitigation measures, same as those identified for the proposed Project, would reduce impacts of construction traffic to mobility and access to less-than-significant levels:

> **Mitigation Measure 7B.15-1:** *Construction Traffic Control Measures.* The following traffic control measures are required to address impacts from construction of individual projects for Additional Housing Alternative B.
>
> - ***Protection and Maintenance of Public Transit Access and Routes***. Stanford and its contractors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, during project construction without prior approval from the VTA and other affected jurisdictions. Such approvals shall require submittal and advance coordination per VTA's Bus Stop Relocation Policy of a mitigation plan to reduce transit impacts to a less than significant level. Potential actions that would impact access to transit include, but are not limited to, relocating or removing public transit bus stops, limiting access to public transit bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.
>
> - ***Maintenance of Pedestrian Access***. Stanford and its contractors shall be prohibited from substantially limiting pedestrian access to properties or facilities during construction of the project, without prior approval from the affected jurisdictions. Such approvals shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting pedestrian access include, but are not limited to, sidewalk closures, bridge closures, crosswalk closures, pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided if determined by the County to be needed for pedestrian safety.

- ***Maintenance of Bicycle Access***. Stanford and its contractors shall be prohibited from substantially limiting bicycle access to properties or facilities during construction of the project, without prior approval from those jurisdictions. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less than significant level. Actions substantially limiting bicycle access include, but are not limited to, bike lane closures or narrowing, closing or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists.

- ***Protection and Maintenance of Emergency Service Access and Routes***. Stanford shall inform the Stanford Police and Palo Alto Police and Fire Departments of construction locations, and shall designate alternate evacuation and emergency routes to maintain response times during construction periods.

- ***Parking for Construction-Related Vehicles***. Stanford shall provide adequate on-campus parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the Stanford campus, a satellite parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to/from the job site.

- ***Restriction on Construction Delivery Hours***. Stanford shall make feasible attempts to avoid construction material deliveries from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM on weekdays. When feasible, Stanford shall be required to prohibit or limit the number of construction employees arriving or departing the site between 4:30 PM and 6:00 PM.

- ***Construction Truck Routes***. Stanford shall deliver and remove all construction-related equipment and materials on truck routes designated by the Cities of Palo Alto and Menlo Park and, in the event the County of San Mateo designates truck routes, by the County of San Mateo. Heavy construction vehicles shall be prohibited from accessing the site from routes that the Cities of Palo Alto, Menlo Park or County of Santa Clara have prohibited for use by such vehicles. Stanford shall provide written notification to all contractors regarding appropriate routes to and from construction sites and the weight and speed limits for local roads used to access construction sites. A copy of all such written notifications shall be submitted to the County Planning Office.

- ***Phone Number for Complaints***. Stanford shall post at least one sign no smaller than 1,296 square inches at all active construction sites. The sign shall contain the name, telephone number and e-mail address of the appropriate Stanford person the public may contact to report alleged violations of this mitigation measure or to register complaints about construction traffic associated with building projects under the 2018 General Use Permit. Stanford shall keep a written record of all such complaints and shall provide copies of these records to the County Planning Office as part of the annual report process.

- ***Construction Impact Mitigation Plan***. In lieu of the above mitigation measures, Stanford may submit a detailed construction impact mitigation plan to the County for review and approval prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an

acceptable method of reducing or eliminating significant transportation impacts. If Stanford determines that it is not feasible to comply with the "Restriction on Construction Delivery Hours" above, then the plan shall also explain the basis for this infeasibility determination. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.

- ***Construction During Special Events***. Stanford shall prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be obtained to host such events during significant construction phases.

Significance after Mitigation: Less than Significant.

Operational Impacts

2018 Baseline With Additional Housing Alternative B Conditions

Impact 7B.15-2: Implementation of Additional Housing Alternative B could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Additional Housing Alternative B conditions. (*Significant*)

Impacts associated with Additional Housing Alternative B are identified by comparing the 2018 Baseline traffic volumes to the 2018 Baseline with Additional Housing Alternative B Conditions traffic volumes. Significant impacts are identified based on the applicable impact criteria, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay and critical V/C ratios[79] for intersections operating unacceptably. The results of the LOS analysis are summarized in **Table 7B.15-4**. Significant impacts would occur at five intersections under this alternative – the same five that would occur under the proposed Project.[80] Generally, at the study intersections located closest to the campus, Additional Housing Alternative B would increase congestion compared to the proposed Project. At the study intersections located farther from the campus, this alternative would reduce congestion by a small degree compared to the proposed Project because peak-hour, peak-direction residence-based trips are assumed to start and end at destinations closer to the Stanford campus as compared to peak-hour, peak-direction commute trips. When compared to the proposed Project, Additional Housing Alternative B would add approximately 110 peak hour trips to intersections directly adjacent to the campus along El Camino Real and between 10 to 60 peak hour trips to intersections that border the campus along Sand Hill Road and Junipero Serra Boulevard. Overall, Additional Housing Alternative B would not reduce significant effects of the proposed 2018 General Use Permit under 2018 conditions.

79 V/C ratios (volume-to-capacity ratios) are calculated based on traffic volumes and capacity values for various types of roadways that comprise intersections.

80 The Draft EIR identified one additional intersection with a significant impact under the proposed 2018 General Use Permit, at Intersection #31, Foothill Expressway / San Antonio Road. However, that result was due to a volume error that has since been corrected. This correction will be reflected in the forthcoming Response to Comments Document.

TABLE 7B.15-4
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
1	I-280 NB On-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.4 12.5	B+ B	10.2 13.5	B+ B	0.015 0.032	-0.2 1.1	10.2 13.5	B+ B	0.021 0.032	-0.2 1.1
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**137.4** 21.4	**F** C+	**0.038** 0.021	**18.9** 0.2	**137.5** 21.8	**F** C+	**0.038** 0.029	**19.0** 0.6
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	32.4 21.0	C- C+	42.4 21.7	D C+	0.037 0.032	15.7 1.3	41.7 21.7	D C+	0.035 0.032	14.7 1.3
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	15.0 21.7	B C+	15.3 21.2	B C+	0.036 0.031	0.6 -0.5	15.3 21.2	B C+	0.034 0.031	0.5 -0.5
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	16.7 16.6	B B	16.8 16.3	B B	0.036 0.032	0.4 -0.1	16.7 16.3	B B	0.034 0.032	0.3 -0.1
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	16.1 16.9	B B	16.0 16.8	B B	0.000 0.000	0.0 0.0	16.0 16.8	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	48.9 48.1	D D	49.8 49.0	D D	0.031 0.038	1.4 1.7	50.3 49.1	D D	0.041 0.037	2.6 1.6
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.6 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.0 0.1	10.5 3.9	B+ A	0.028 0.029	0 0.1
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	23.3 28.2	C C	24.3 29.2	C C	0.028 0.027	1.6 1.2	23.9 28.9	C C	0.030 0.031	1.3 1.0
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.9 27.3	C+ C	20.9 27.7	C+ C	0.009 0.017	0.3 0.7	20.8 27.6	C+ C	0.015 0.023	0.3 0.6
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	18.5 27.3	B- C	19.3 27.8	B- C	0.013 0.017	1.3 0.9	20.2 28.3	C+ C	0.026 0.027	2.6 1.7
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	39.0 34.1	D C-	38.9 34.3	D+ C-	0.012 0.016	-0.1 0.3	39.0 34.3	D C-	0.014 0.015	0.1 0.3
13	I-280 SB Ramps / Page Mill Rd*	Santa Clara County	LOS E (warrant)	AM PM	**151.7** **85.9**	**F** **F**	**153.3** **88.3**	**F** **F**	N/A	N/A	**153.5** **88.6**	**F** **F**	N/A	N/A
14	I-280 NB Ramps / Page Mill Rd*	Santa Clara County	LOS E (warrant)	AM PM	40.5 14.8	E B	41.5 14.9	E B	N/A	N/A	41.5 14.9	E B	N/A	N/A
15	Deer Creek Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	14.5 13.5	B B	15.4 13.7	B B	0.026 0.021	1.4 -0.3	15.4 13.7	B B	0.026 0.026	1.4 -0.3
16	Coyote Hill Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	7.5 9.0	A A	8.0 9.4	A A	0.014 0.021	0.0 -0.2	8.0 9.4	A A	0.020 0.026	0.0 -0.2
17	Junipero Serra Blvd - Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**101.5** **109.9**	**F** **F**	**0.029** **0.063**	**7.2** **19.3**	**104.7** **111.0**	**F** **F**	**0.043** **0.070**	**13.1** **20.4**

TABLE 7B.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
18	Peter Coutts / Page Mill Rd	Santa Clara County	LOS E	AM PM	20.9 29.7	C+ C	21.3 29.8	C+ C	0.020 0.015	0.6 0.0	21.7 30.2	C+ C	0.029 0.024	1.1 0.3
19	Hanover St / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	63.0 47.6	E D	65.7 48.2	E D	0.013 0.017	0.6 -0.1	67.2 48.5	E D	0.020 0.023	1.0 -0.3
20	El Camino Real / Page Mill Rd - Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	61.2 66.2	E E	66.1 68.8	E E	0.047 0.021	6.5 2.7	68.7 70.3	E E	0.063 0.019	11.8 5.4
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	63.6 58.5	E E+	64.2 58.9	E E+	0.009 0.012	1.0 0.5	64.4 59.1	E E+	0.011 0.014	1.2 0.6
22	Oregon Expy / West Bayshore Rd	Santa Clara County	LOS E	AM PM	20.7 18.9	C+ B-	20.7 19.1	C+ B-	0.003 0.008	0.1 0.2	20.7 19.2	C+ B-	0.007 0.012	0.1 0.4
23	I-280 SB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	40.2 16.1	E C	41.0 16.2	E C	N/A	N/A	40.8 16.2	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	27.2 26.8	D D	28.5 29.9	D D	N/A	N/A	28.8 29.9	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Rd	Menlo Park	LOS D	AM PM	43.8 48.8	D D	46.2 50.9	D D	0.049 0.048	3.0 2.4	46.1 50.8	D D	0.046 0.048	2.8 2.4
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	28.7 40.7	C D	30.5 45.4	C D	0.009 0.052	1.2 5.9	31.3 44.6	C D	0.025 0.045	3.0 4.9
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14.1 16.3	B B	14.5 17.9	B B	0.020 0.036	0.8 2.8	14.5 17.8	B B	0.028 0.042	0.8 2.5
28	Junipero Serra Blvd / Stanford Ave	Santa Clara County	LOS E	AM PM	19.6 21.1	B- C+	21.0 25.1	C+ C	0.061 0.076	1.8 4.4	21.5 25.3	C+ C	0.071 0.090	2.4 4.9
29	Foothill Expy / Hillview Ave	Santa Clara County	LOS E	AM PM	35.0 34.9	C- C-	35.7 35.1	D+ D+	0.006 0.015	-0.3 0.2	35.7 35.2	D+ D+	0.007 0.014	-0.3 0.2
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	74.7 **95.8**	E **F**	0.016 **0.150**	4.6 **-1.0**	74.3 **95.4**	E **F**	0.015 **0.149**	3.9 **-1.8**
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	LOS E	AM PM	18.7 75.8	B- E-	19.2 78.5	B- E-	0.016 0.022	0.6 4.7	19.1 78.0	B- E-	0.014 0.019	0.5 4.1
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	LOS E	AM PM	74.6 **88.9**	E **F**	79.0 **89.9**	E- **F**	0.014 **0.004**	9.5 **1.3**	78.3 **89.8**	E- **F**	0.012 **0.003**	8.1 **1.1**
33	Foothill Expy / Springer Road-Magdalena Ave	Santa Clara County (SC CMP)	LOS E	AM PM	62.6 71.9	E E	64.0 73.2	E E	0.015 0.010	1.9 2.3	63.8 73.2	E E	0.013 0.010	1.7 2.3
34	Bowdoin St / Stanford Ave*	Palo Alto	LOS E (warrant)	AM PM	14.4 18.5	B C	18.4 27.6	C D	N/A	N/A	18.6 29.7	C D	N/A	N/A

TABLE 7B.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
35	Arboretum Rd / Quarry Rd	Palo Alto	LOS D	AM PM	43.6 41.5	D	44.1 42.1	D D	0.040 0.039	1.2 1.4	45.0 43.2	D D	0.077 0.074	3.1 3.0
36	Arboretum Rd / Palm Dr	Palo Alto	LOS D	AM PM	29.9 28.6	C C	31.9 29.4	C C	0.085 0.044	3.3 1.3	33.0 30.2	C- C	0.101 0.064	4.8 2.1
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	17.2 29.9	B C	17.0 29.8	B C	0.011 0.015	-0.1 0.1	17.0 29.8	B C	0.010 0.014	-0.1 0.1
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	42.5 42.0	D D	42.4 42.2	D D	0.017 0.015	0.4 0.5	42.3 42.2	D D	0.015 0.015	0.3 0.5
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	31.3 35.6	C D+	31.0 35.4	C D+	0.018 0.017	-0.3 -0.1	31.0 35.4	C D+	0.016 0.016	-0.3 -0.1
40	El Camino Real / Santa Cruz Ave	Menlo Park	LOS D	AM PM	14.0 23.0	B C	13.8 22.7	B C+	0.018 0.016	-0.3 -0.4	13.8 22.7	B C+	0.016 0.015	-0.3 -0.3
41	El Camino Real / Ravenswood Rd	Menlo Park	LOS D	AM PM	43.7 47.0	D D	43.9 47.2	D D	0.022 0.020	0.6 0.7	43.9 47.3	D D	0.021 0.021	0.6 0.8
42	El Camino Real / Roble Ave	Menlo Park	LOS D	AM PM	14.4 14.7	B B	14.1 14.3	B B	0.014 0.013	-0.3 -0.3	14.1 14.3	B B	0.013 0.013	-0.3 -0.3
43	El Camino Real / Middle Ave	Menlo Park	LOS D	AM PM	27.2 27.5	C C	27.0 27.2	C C	0.014 0.009	-0.3 -0.2	27.0 27.2	C C	0.013 0.010	-0.3 -0.2
44	El Camino Real / Cambridge Ave	Menlo Park	LOS D	AM PM	13.6 19.6	B B-	13.4 19.5	B B-	0.014 0.009	-0.3 -0.2	13.4 19.5	B B-	0.013 0.010	-0.2 -0.2
45	El Camino Real / Quarry Rd	Palo Alto	LOS D	AM PM	14.3 33.2	B C-	15.8 34.2	B C-	0.029 0.031	1.6 1.6	16.6 34.9	B C-	0.037 0.048	2.4 2.6
46	El Camino Real (SB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	21.1 20.3	C+ C+	20.7 20.0	C+ C+	0.028 0.030	-0.2 -0.3	20.8 20.0	C+ B-	0.030 0.036	-0.2 -0.2
47	El Camino Real (NB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	19.5 26.3	B- C	20.0 26.4	B- C	0.030 0.033	0.4 0.8	20.0 26.3	C+ C	0.035 0.043	0.6 0.6
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	LOS E	AM PM	45.9 51.1	D D-	47.5 54.9	D D-	0.047 0.059	2.0 7.0	47.7 56.6	D E+	0.060 0.079	2.3 10.3
49	El Camino Real / Churchill Ave	Palo Alto	LOS D	AM PM	24.7 26.6	C C	24.4 26.4	C C	0.017 0.018	-0.1 -0.1	24.3 26.3	C C	0.027 0.032	-0.2 0.0
50	El Camino Real / Serra St	Palo Alto	LOS D	AM PM	24.5 28.0	C C	27.8 33.2	C C-	0.082 0.112	5.4 8.0	29.6 34.6	C C-	0.118 0.149	7.2 10.4
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	33.0 31.9	C- C	33.8 33.1	C- C-	0.060 0.054	11.5 2.0	33.6 33.3	C- C-	0.078 0.066	11.2 2.3

TABLE 7B.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	24.0 28.8	C C	22.8 27.9	C+ C	0.029 0.031	-0.9 -0.7	22.5 27.7	C+ C	0.033 0.039	-1.0 -0.9
53	El Camino Real / Arastradero Rd - Charleston Rd	Palo Alto (SC CMP)	LOS E	AM PM	47.8 55.6	D E+	48.3 56.3	D E+	0.020 0.007	0.9 0.4	48.4 56.3	D E+	0.022 0.007	1.1 0.4
54	El Camino Real / San Antonio Rd	Mountain View (SC CMP)	LOS E	AM PM	53.4 53.6	D- D-	53.4 53.5	D- D-	0.008 0.007	0.0 -0.1	53.3 53.5	D- D-	0.007 0.007	0.0 -0.1
55	Alma St / Lytton Ave	Palo Alto	LOS D	AM PM	20.8 18.0	C+ B	21.8 18.6	C+ B-	0.016 0.015	1.5 0.8	22.0 18.9	C+ B-	0.022 0.024	1.8 1.4
56	Alma St / Hamilton Ave	Palo Alto	LOS D	AM PM	6.9 14.9	A B	7.1 15.3	A B	0.008 0.012	0.2 0.8	7.2 15.7	A B	0.012 0.021	0.3 1.6
57	Alma St / Churchill Ave	Palo Alto	LOS D	AM PM	28.2 48.3	C D	28.3 48.3	C D	0.005 0.005	0.1 0.0	28.4 48.5	C D	0.007 0.008	0.2 0.3
58	Alma St / Charleston Rd	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**55.7** **55.9**	**E+** **E+**	**0.010** **0.017**	**0.5** **1.1**	**55.9** **56.1**	**E+** **E+**	**0.012** **0.019**	**0.8** **1.2**
59	Middlefield Rd / Marsh Rd	Atherton	LOS D	AM PM	29.2 53.9	C D-	30.1 54.4	C D-	0.012 0.005	1.4 0.8	30.2 54.4	C D-	0.012 0.005	1.5 0.8
60	Middlefield Rd / Ravenswood Ave	Menlo Park	LOS D	AM PM	34.3 40.4	C- D	35.0 41.2	C- D	0.012 0.012	0.8 0.9	35.1 41.4	D+ D	0.013 0.015	0.9 1.1
61	Middlefield Rd / Ringwood Ave	Menlo Park	LOS D	AM PM	38.0 50.6	D+ D	38.1 50.7	D+ D	0.004 0.005	0.2 0.2	38.3 50.9	D+ D	0.006 0.008	0.4 0.4
62	Middlefield Rd / Willow Rd	Menlo Park	LOS D	AM PM	47.9 47.3	D D	48.0 47.5	D D	0.007 0.006	5.3 0.2	48.0 47.6	D D	0.007 0.008	5.3 0.2
63	Middlefield Rd / Lytton Ave	Palo Alto	LOS D	AM PM	38.0 45.9	D+ D	38.3 46.5	D+ D	0.018 0.016	0.4 0.6	38.4 46.6	D+ D	0.018 0.018	0.4 0.7
64	Middlefield Rd / University Ave	Palo Alto	LOS D	AM PM	30.0 35.6	C D+	30.3 36.1	C D+	0.019 0.031	0.3 0.9	30.4 36.1	C D+	0.019 0.031	0.3 0.9
65	Middlefield Rd / Hamilton Ave	Palo Alto	LOS D	AM PM	11.5 11.6	B+ B+	11.5 11.6	B+ B+	0.009 0.007	0.0 0.0	11.4 11.6	B+ B+	0.008 0.008	0 0
66	Middlefield Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	33.7 39.6	C- D	34.1 40.1	C- D	0.030 0.025	0.7 0.5	34.1 40.2	C- D	0.029 0.026	0.7 0.6
67	St. Francis Drive / Embarcadero Road	Palo Alto	LOS D	AM PM	23.6 17.5	C B	23.4 17.3	C B	0.015 0.014	0.0 -0.1	23.4 17.3	C B	0.014 0.014	0 -0.1
68	E. Bayshore Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	51.3 **57.6**	D- **E+**	51.6 **58.1**	D- **E+**	0.007 **0.005**	0.4 **0.6**	51.7 **58.3**	D- **E+**	0.007 **0.007**	0.5 **0.9**

TABLE 7B.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	50.5 52.6	D D-	50.6 52.7	D D-	0.004 0.006	0.0 0.2	50.6 52.8	D D-	0.006 0.008	0.1 0.4
70	US 101 SB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	32.6 33.9	C- C-	32.6 33.9	C- C-	0.000 0.000	0.0 0.0	32.6 33.9	C- C-	0.000 0.000	0.0 0.0
71	US 101 NB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	18.2 20.7	B- C+	18.2 20.7	B- C+	0.000 0.000	0.0 0.0	18.2 20.7	B- C+	0.000 0.000	0.0 0.0
72	Bay Rd / Willow Rd	Menlo Park	LOS D	AM PM	18.8 10.7	B- B+	18.8 10.7	B- B+	0.008 0.006	0.1 0.0	18.9 10.7	B- B+	0.008 0.007	0.1 0.1
73	Newbridge St / Willow Rd	Menlo Park	LOS D	AM PM	43.5 44.1	D D	43.4 44.1	D D	0.005 0.004	0.0 0.2	43.4 44.1	D D	0.006 0.006	0.0 0.3
74	O'Brien Dr / Willow Rd	Menlo Park	LOS D	AM PM	12.0 14.5	B+ B	11.9 14.5	B+ B	0.003 0.005	0.0 0.0	11.9 14.4	B+ B	0.005 0.005	0.0 0.0
75	Hamilton Ave / Willow Rd	Menlo Park	LOS D	AM PM	40.9 45.3	D D	41.5 45.5	D D	0.005 0.003	1.0 0.3	41.6 45.6	D D	0.006 0.005	1.1 0.4
76	Bayfront Expy / Willow Rd	Menlo Park (SM CMP)	LOS F	AM PM	40.3 57.8	D E+	40.3 58.0	D E+	0.000 0.004	0.0 0.2	40.3 58.0	D E+	0.000 0.004	0.0 0.2
77	Woodland Ave / University Ave	East Palo Alto	LOS D	AM PM	54.5 **60.1**	D- **E**	54.8 **60.3**	D- **E**	0.000 **0.000**	0.0 **0.0**	54.8 **60.3**	D- **E**	0.000 **0.000**	0.0 **0.0**
78	US 101 SB Ramps / University Ave	East Palo Alto	LOS D	AM PM	29.4 25.5	C C	29.4 25.5	C C	0.003 0.006	0.1 0.1	29.4 25.5	C C	0.004 0.006	0.1 0.1
79	Donohoe St / University Ave	East Palo Alto	LOS D	AM PM	**72.4** 44.3	**E** D	**73.2** 44.3	**E** D	**0.005** 0.004	**1.3** 0.1	**73.1** 44.3	**E** D	**0.004** 0.004	**1.1** 0.1
80	University Ave / Bay Rd	East Palo Alto	LOS D	AM PM	48.6 50.1	D D	48.7 50.6	D D	0.005 0.009	0.2 0.9	48.7 50.7	D D	0.004 0.011	0.1 1.1
81	University Ave / Bayfront Expy	Menlo Park (SM CMP)	LOS F	AM PM	23.6 94.4	C F	23.7 96.9	C F	0.008 0.007	0.2 3.1	23.7 97.1	C F	0.009 0.008	0.3 3.4
82	Town & Country Driveway / Embarcadero Rd	Palo Alto	LOS D	AM PM	28.9 28.4	C C	28.1 28.0	C C	0.031 0.021	-0.6 -0.3	28.1 27.9	C C	0.030 0.026	-0.6 -0.3
83	Charleston Rd / San Antonio Rd	Palo Alto (SC CMP)	LOS E	AM PM	61.6 62.5	E E	61.8 62.7	E E	0.001 0.002	0.3 0.4	61.8 62.7	E E	0.001 0.002	0.4 0.4
84	US 101 SB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	11.4 13.0	B+ B	11.5 13.0	B+ B	0.002 0.000	0.2 0.0	11.4 13.0	B+ B	0.002 0.000	0.2 0.0
85	US 101 NB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	21.1 23.5	C+ C	21.2 23.5	C+ C	0.000 0.002	0.0 0.1	21.2 23.5	C+ C	0.000 0.004	0.0 0.1

TABLE 7B.15-4 (CONTINUED)
BACKGROUND (2018) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	Background (2018) No Project[d]		Background (2018) With Proposed Project[d]				Background (2018) With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
86	Central Expy / Rengstorff Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**175.3** **83.9**	**F** **F**	**177.4** **86.1**	**F** **F**	**0.010** **0.008**	**3.1** **1.3**	**177.3** **86.2**	**F** **F**	**0.009** **0.009**	**2.9** **1.4**
87	Central Expy / Shoreline Blvd (N)	Santa Clara County (SC CMP)	LOS E	AM PM	3.6 7.0	A A	3.6 6.9	A A	0.003 0.007	0.0 -0.1	3.6 6.9	A A	0.005 0.007	0.0 -0.1
88	Central Expy / Shoreline Blvd (S)	Santa Clara County (SC CMP)	LOS E	AM PM	12.0 7.6	B+ A	11.9 7.5	B+ A	0.003 0.005	-0.1 0.0	11.9 7.5	B+ A	0.004 0.006	-0.2 0.0
89	Central Expy / Castro St-Moffett Blvd	Santa Clara County (SC CMP)	LOS E	AM PM	**122.6** **94.4**	**F** **F**	**125.1** **97.1**	**F** **F**	**0.007** **0.006**	**4.1** **3.3**	**125.0** **97.4**	**F** **F**	**0.006** **0.006**	**3.9** **3.7**
90	Foothill Expy / Edith Ave	Santa Clara County	LOS E	AM PM	28.9 39.0	C D+	29.2 43.2	C D	0.016 0.288	0.6 22.9	29.1 42.7	C D	0.014 0.287	0.5 22.0
91	Foothill Expy / Main St	Santa Clara County (SC CMP)	LOS E	AM PM	23.0 24.3	C+ C	23.2 24.4	C C	0.016 0.009	0.5 -0.4	23.2 24.5	C C	0.014 0.009	0.4 -0.4
92	University Ave / O'Brien Dr	Menlo Park	LOS D	AM PM	9.2 12.7	A B	9.2 12.7	A B	0.005 0.006	0.0 0.0	9.2 12.7	A B	0.005 0.006	0.0 0.0
93	University Ave / Adams Dr*	Menlo Park	LOS E (warrant)	AM PM	76.3 30.7	F[10] D	79.8 31.9	F[10] D	N/A	N/A	80.2 32.1	F[10] D	N/A	N/A
94	University Ave / Runnymede St	East Palo Alto	LOS D	AM PM	15.3 19.9	B B-	15.3 19.8	B B-	0.005 0.005	0.0 0.0	15.3 19.8	B B-	0.005 0.005	0.0 0.0
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 18.2	B B-	14.7 18.1	B B-	0.005 0.005	0.0 -0.1	14.7 18.1	B B-	0.005 0.005	0.0 -0.1

NOTES: **Bold text** indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

In some cases, intersections may show a reduction in average delay with the addition of Project traffic, or with the addition of Additional Housing Alternative B traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County, "(SM CMP)" indicates CMP intersection in San Mateo County.

[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(Warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.

[c] AM = morning peak hour, PM = evening peak hour.

[d] Background (2018) With Proposed 2018 General Use Permit presents the results it was included in the Draft EIR. These results are provided for comparison purposes only.

[e] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.

[f] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software packages, which applies the methods described in the 2000 *Highway Capacity Manual*.

[g] Change ("Δ") in critical volume to capacity ratio (V/C) between Background (2018) and Background (2018) With Project; and between Background (2018) and Background (2018) With Additional Housing Alternative B Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[h] Change ("Δ") in average critical movement delay between Background (2018) and Background (2018) With Project; and between Background (2018) and Background (2018 With Additional Housing Alternative B Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[i] A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

The intersections where Additional Housing Alternative B would have a significant impact under 2018 Baseline with Additional Housing Alternative B conditions, and the reason that the impact is considered significant, are documented in **Table 7B.15-5**. Measures/strategies to mitigate the significant impacts are described below.

TABLE 7B.15-5
2018 BASELINE WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#13 I-280 SB Off-Ramp / Page Mill Road (AM and PM Peak Hours)	**Unsignalized Intersection:** Under unacceptable LOS F conditions without and with the project, peak-hour traffic signal warrant would be met.
#17 Junipero Serra Blvd – Foothill Expy / Page Mill Rd (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Project-generated traffic would cause a degradation from an acceptable LOS D to an unacceptable LOS E.

Mitigation Measure 7B.15-2(a) addresses peak hour, peak direction project impacts, with fair share mitigation fees triggered if the "no net new commute trips" standard is not achieved, while Mitigation Measure 7B.15-2(b) addresses peak-hour, off-peak (reverse commute) direction impacts, which are not subject to the "no net new commute trips" standard and, therefore, fair share mitigation fees are triggered upon project approval.[82a]

> **Mitigation Measure 7B.15-2(a):** Stanford shall mitigate the transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of fair share fees for the improvements for adversely affected intersections specified in Table 1B [minus the contribution to these improvements provided pursuant to Mitigation Measure 7B.15-2(b), below], which funds shall be expended by the County to fund mitigation efforts.
>
> 1. As specified on page 64 and Policy C-1 of the Stanford Community Plan, the no net new commute trips standard is defined as no increase in automobile trips during peak commute times in the peak commute direction, as counted at defined cordon locations around the central campus. The peak commute period is defined as the one-hour period in the morning (AM) and afternoon (PM) with the highest volume of traffic at the cordon locations, as determined by traffic counts.
>
> 2. The reasonable cost of all traffic counts and other work conducted for determination of compliance with this mitigation measure shall be paid for by Stanford. The counts shall be performed by an independent consultant under the direction of the County Planning Office or provided to the County Planning Office through another County-approved methodology.

[82a] Fehr and Peers, 2018 Stanford General Use Permit: Reverse-Commute Analysis, Appendix RCA.

TABLE 1B
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE B

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alternative B	2035 Cumulative with Additional Housing Alternative B
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	Contribute fair share funding toward the addition of second northbound right-turn lane, as identified in the ConnectMenlo Final Environmental Impact Report.	X	X
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X	
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair-share funding toward the addition of a third westbound through lane on Page Mill Road and a receiving lane on the west leg of the intersection (resulting in three westbound lanes from Junipero Serra Boulevard to approximately Old Page Mill Road); installation of an overlap signal phase for northbound, southbound, and westbound right-turning vehicles; at the signalized intersection of Junipero Serra Boulevard – Foothill Expressway / Page Mill Road and widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane	X	X
19	Hanover St / Page Mill Rd – Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a second westbound left-turn lane, identified as an option in the Page Mill Expressway Corridor Study Report.		X
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report. Contribute fair-share funding toward the installation of a southbound right-turn lane and overlap phase.		X
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	No feasible mitigation measure.		X
29	Foothill Expy / Hillview Ave	Santa Clara County	No feasible mitigation measure.		X
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward a grade separation improvement project, as identified in the draft Santa Clara County Expressway Plan 2040. The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.	X	X

TABLE 1B (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE B

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alternative B	2035 Cumulative with Additional Housing Alternative B
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue as identified in the draft Santa Clara County Expressway Plan 2040.		X
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the addition of a third northbound through lane and associated receiving lane that extends to San Antonio Avenue, as identified in the draft Santa Clara County Expressway Plan 2040.		X
33	Foothill Expy / Springer Road - Magdalena Ave	Santa Clara County (SC CMP)	Contribute fair share funding toward the following improvements, as identified as a Tier 2 improvement in the draft Santa Clara County Expressway Plan 2040: • Convert the signal to provide 8-phase phasing; • Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and • Change the configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.		X
37	El Camino Real / Encinal Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
38	El Camino Real / Valparaiso Ave	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane. Contribute fair-share funding toward widening Menlo Avenue for an exclusive left-turn lane.		X
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	Contribute fair share funding toward the addition of a second northbound left-turn lane.		X
56	Alma St / Hamilton Ave	Palo Alto	Contribute fair share funding toward the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, by removing a portion of the parking.		X
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements.	X	X

TABLE 1B (CONTINUED)
STUDY INTERSECTION MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE B

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alternative B	2035 Cumulative with Additional Housing Alternative B
59	Middlefield Rd / Marsh Rd	Atherton	Contribute fair share funding toward the addition of a second westbound left-turn lane and second receiving lane on the south leg.		X
63	Middlefield Rd / Lytton Ave	Palo Alto	No feasible mitigation measure.		X
66	Middlefield Rd / Embarcadero Rd	Palo Alto	No feasible mitigation measure.		X
89	Central Expy / Moffett Blvd	Santa Clara County (SC CMP)	The City of Mountain View's planned closure of Castro Street at the train tracks to form a T-intersection of Central Expressway and Moffett Boulevard would mitigate Additional Housing Alternative B's impact (Mountain View Transit Center Master Plan). If the Castro Street closure project is not implemented, the secondary, back-up mitigation is to contribute fair-share funding toward the construction of a second southbound left turn lane from Central Expressway to Moffett Boulevard. Stanford shall contribute its fair-share funding toward the second southbound left-turn lane from Central Expressway to Moffett Boulevard. The funding can be used for the Castro Street closure project.		X
90	Foothill Expressway / Edith Avenue	Santa Clara County (SC CMP)	No feasible mitigation measure.		X

3. The baseline for measuring the no net new commute trips standard shall be the count that was established in 2001. However, during implementation of the 2018 General Use Permit, the County may modify, or approve Stanford-proposed modifications to the monitoring methodology on new technology such as automation, so long as the basic principles underlying the no net new commute trips standard are still met. If the monitoring methodology is updated, testing and calibration of the new methodology or equipment will require coordination with the County. The County may adjust the 2001 baseline as needed to reflect any such calibration. Monitoring counts shall be performed each year using the County-approved methodology.

4. Traffic counts and determination of traffic volumes shall occur as described below, unless modifications are approved the County Planning Office.

    a. Peak-hour traffic for a single year shall be determined through counts taken at two times during the year. All counts shall be conducted during the regular academic year, which does not include academic breaks or end-of-quarter finals. Homecoming or other irregular traffic patterns should be avoided. Specific dates for each count shall be determined by the County Planning Office. The two annual counts shall be averaged to determine the annual traffic level for each monitoring year.

        i. During monitoring periods, the total amount of traffic crossing the cordon line will be counted by travel direction. The cordon count monitoring will be conducted on a 24-hour basis. The morning (AM) and afternoon (PM) peak hours within the 24-hour count period will be calculated based on total volumes to determine the campus-wide peak hours.

        ii. All counts shall be taken at the campus entry and exit points shown in Figure 5.15-2, which together form the defined cordon line. Additional cordon gateways may be added or the location of the cordon line may be modified as determined by the County.

            a) Traffic counts shall include a methodology to determine the rate of cut-through traffic.

                1) Cut-through trips will be identified through license plates on each vehicle or other means. Entry and exit times will be noted to determine when a vehicle crosses the cordon in either direction.

                2) Matching license plates will be determined by comparing numbers that crossed both an entering and exiting cordon within a defined period (i.e., 20 minutes or as updated), or through other means. Vehicles that enter and exit the cordon within the time period will be cut-through trips across the campus without a campus-related purpose. If data are available or it is feasible to measure, the County will include in the cordon counts all rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs.

            b) Cordon volumes will be adjusted to account for use of parking lots within the cordon line by hospital-related traffic and use of lots outside the cordon line by campus-related traffic. Parking areas change due to the evolving

needs of campus and hospital operations. The lots used for hospital and university parking shall be confirmed prior to annual surveys. The County reserves the right to change the methodology related to hospital parking or other parking factors in response to changing conditions.

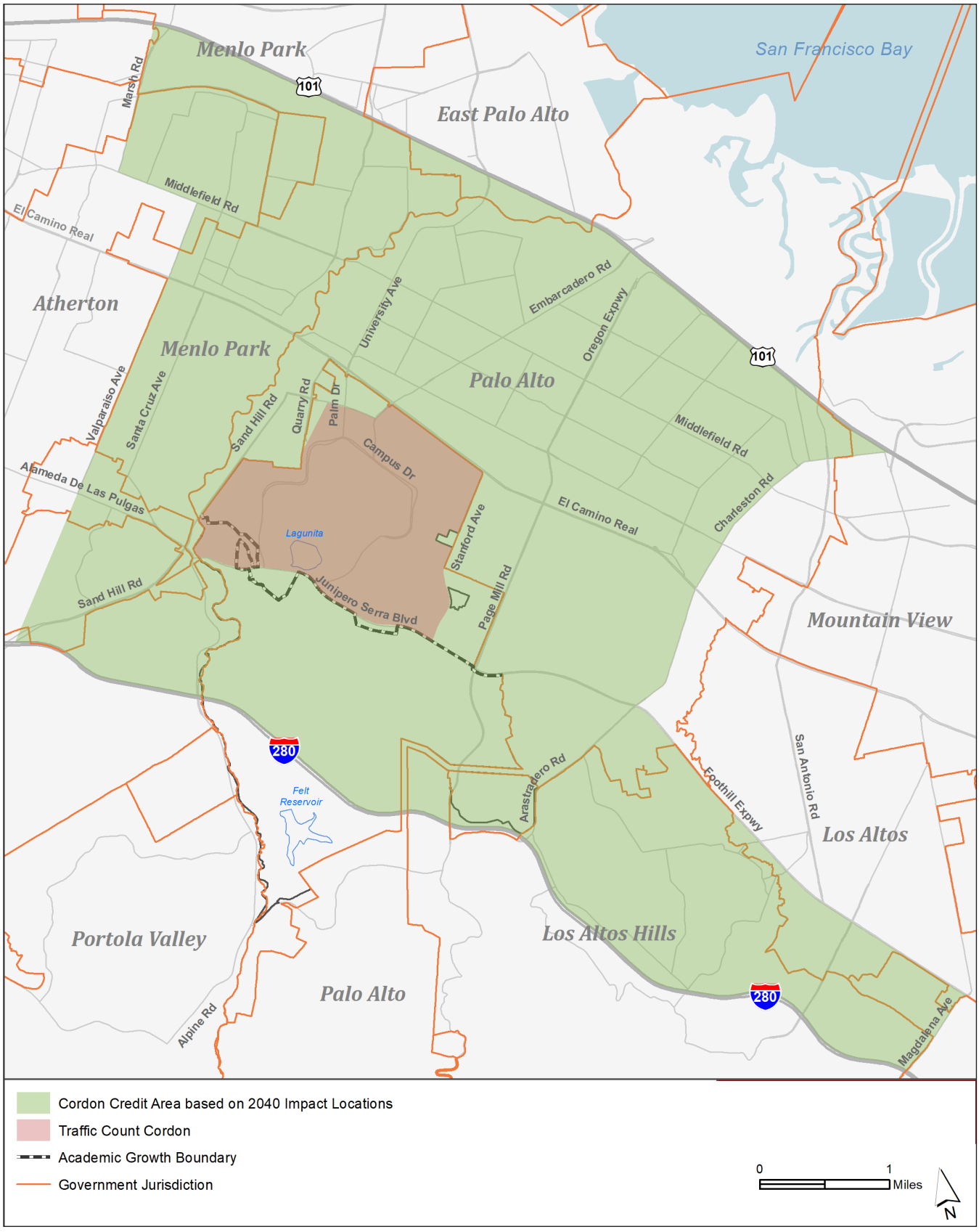
1) Hospital trips will be subtracted from the count and campus trips will be added to the count. The count adjustment will also factor in the potential for hospital trips to park in the campus lots and campus trips to park in the hospital lots. At the beginning and end of the peak hours, data will need to be collected from each lot. If campus parking occurs in lots outside the cordon, trips associated with those vehicles will be added back into the count. If hospital parking occurs inside the cordon, trips associated with those vehicles will be subtracted from the count. All vehicles without a parking permit will be assumed to be correctly parked in their respective lots, unless the County approves an alternate protocol for assigning such parking.

c) Based on the 24-hour counts, the AM and PM peak hours will be identified for the campus. Peak hour traffic volume will be determined for the campus based on the count, adjusted for cut-through traffic and hospital parking as described above.

1) Total entering and exiting traffic will be summed for the 16 campus gateways. A single AM and PM peak hour will be determined for the entire campus based on the peak inbound traffic in the AM period and the peak outbound traffic in the PM period. The percent of cut-through trips calculated by the license plate matching (or other technology) described above will be removed. With the exception of rideshare trips (e.g., Uber and Lyft) and other trips associated with drop-offs and pick-ups of people from locations within the cordon line that are not using public or Stanford-sponsored transit programs, the cut-through vehicles will be removed from both the inbound and the outbound traffic since they will have been observed crossing both an entering and exiting cordon boundary. Finally, the entering and exiting traffic for hospital uses inside the cordon boundary and the campus uses outside the cordon boundary calculated as described above will be subtracted from or added to the counts.

5. As specified by Community Plan Policy C-8, the County Planning Office will recognize participation by Stanford in off-campus trip reduction efforts and credit those reduced trips towards Stanford's attainment of the no net new commute trips standard. Stanford shall receive credit commensurate with the actual number of trips reduced outside the cordon due to Stanford's direct efforts, or the proportion of the cost of the program to which Stanford is contributing. A reduction of an off-campus trip may be recognized as long as at least one terminus for the trip is within the area shown on **Figure 7B.15-1**.[81] The County Planning Office will determine the appropriate trip credit and monitoring methodology for each program in which Stanford proposes to participate. Such proposals shall be submitted by Stanford to the County Planning

[81] Please note this figure is identical to Figure 5.15-8 in the Draft EIR, and was not revised for Additional Housing Alternative B.



SOURCE: Stanford LBRE LUEP

Stanford 2018 General Use Permit . 160531

Figure 7B.15-1
Revised Cordon Credit Area

Office for review, modification and potential approval. The proposals shall be presented to the Community Resource Group prior to any determination by the County Planning Office. Once the County Planning Office has accepted the proposal and the program implementation begins, the County Planning Office will identify, at Stanford's cost, the number of trips reduced outside the cordon and calculate a trip reduction credit for application toward attainment of the no net new commute trips standard, with the continuing requirement that Stanford provide evidence of its participation in the ongoing program in a manner that can be independently verified. The County reserves the right to further regulate Project-generated trips and the use of trip credits through the Conditions of Approval for the General Use Permit.

Funding of off-campus circulation infrastructure improvements may also qualify for trip credits if the improvements will enhance safety or increase mobility for pedestrians, bicyclists or transit users within the local impact area, and thereby remove vehicular trips from the local impact area. For example, funding roadway widening or modifications to add transit vehicle or bicycle lanes or to add signals to improve pedestrian or bicycle safety could qualify for trip credits under this approach if approved by the County. Any proposal for such credits shall be accompanied by substantial evidence demonstrating that the infrastructure project would remove vehicular trips from the local impact area. Once the County Planning Office has approved infrastructure improvement project for a trip reduction credit, the project has been implemented, and the trip reductions have been verified, the trip reduction credit will be factored into the County's conclusion regarding Stanford's annual compliance with the no net new commute trips standard in each subsequent year.

Each year, the County will report Stanford's trip credits in its annual monitoring report. The County will track and calculate trip reduction credits in a manner designed to ensure that credits benefit the three geographic sub-areas surrounding the Stanford campus (north, east, and south/southwest) in rough proportion to the 2018 General Use Permit trip assignment forecasted in the Draft EIR. Trip reduction credits with area-wide benefit will be tracked separately from trip reduction credits with sub-area geographic benefits.

6. The County Planning Office shall monitor the cordon counts using the procedures described above. If the cordon counts, as modified by trip reduction credits, exceed the baseline volume by 1% or more for any two out of three consecutive years, mitigation of impacts to intersections in the form of fair share payments will be required, implementing Stanford Community Plan Implementation Recommendation C(i)(9). Table 1B identifies the intersection impacts that could occur if the no net new commute trips standard is not achieved, and the physical improvements that would substantially reduce each impact.

   Upon the County's determination that the no net new commute trips standard has been exceeded by 1% or more in two out of three consecutive years, the County will require Stanford to make its fair share contribution toward improvements at adversely affected intersections and roadways based on all exceedances of the "no net new commute trips" standards.

   The County Planning Office will use the intersection improvement fees collected from Stanford as follows:

a. The fees shall be used to fund the intersection improvements identified in Table 1B. The priority order for funding such intersection improvements will be determined by the County Planning Office in consultation with the affected jurisdictions. If the fees are used to fund an intersection improvement in another jurisdiction, the County will enter into an agreement with such jurisdiction to address the timing for the County to provide the funding, the timing for the relevant jurisdiction to complete the improvement, and any other matters that the County determines to be appropriate.

b. Substitute Mitigation: If the County Planning Office determines that it is not feasible to use the fees for the specified intersection improvements (e.g., it does not appear that there will be full funding for the improvements within a reasonable time; the public agencies with authority or jurisdiction over the improvement projects will not approve the projects), then the fees may be used to fund off-campus projects that encourage and improve the use of alternative transportation modes or otherwise reduce peak period traffic in the local impact area, including but not limited to transit improvements that would directly or indirectly benefit the local impact area. This fund also could be used for transportation improvements that increase safety and mobility for pedestrians, bicyclists and transit users provided there is substantial evidence demonstrating how the improvements would remove vehicular trips from the local impact area.

Mitigation Measure 7B.15-2(b): Stanford shall mitigate the transportation impacts of its additional development and population growth with respect to reverse-commute impacts through the contribution of fair share fees for the cost of improvements for adversely affected intersections specified in Table 2B (a subset of the adversely affected intersections specified in Table 1B), which funds shall be expended by the County to fund transportation mitigation efforts in the same manner as provided in Mitigation Measure 7B.15-2(a)(6)(a) and (b).

Significance after Mitigation: Significant and Unavoidable.

This mitigation would substantially reduce traffic congestion impacts to intersections; however, this is considered a significant and unavoidable impact because it is uncertain whether it would be feasible to improve some of the affected intersections if the No Net New Commute Trips standard is not achieved, if there are not sufficient additional funds to complete the intersection impacts, or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2018 Baseline with Additional Housing Alternative B conditions are located in other jurisdictions (i.e., other than County of Santa Clara, such as City of Palo Alto, Caltrans, etc.), and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. For these reasons, the impact would remain significant and unavoidable.

TABLE 2B
STUDY INTERSECTION REVERSE-COMMUTE MITIGATION MEASURES UNDER ADDITIONAL HOUSING ALTERNATIVE B

ID No.	Intersection	Jurisdiction/ Congestion Management Program (CMP)	Mitigation Measure	2018 Baseline with Additional Housing Alternative B	2035 Cumulative with Additional Housing Alternative B	Fair Share Contribution[a]
13	I-280 SB Off-Ramp / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair share funding toward the installation of a traffic signal.	X		17.9%
17	Junipero Serra Blvd – Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	Contribute fair-share funding toward installation of an overlap signal phase for northbound and southbound right-turning vehicles, and widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane.	X	X	16.0%
20	El Camino Real / Page Mill Rd - Oregon Expressway	Santa Clara County (SC CMP)	Contribute fair share funding toward the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, identified in the Page Mill Expressway Corridor Study Report.		X	10.8%
29	Foothill Expy / Hillview Ave	Santa Clara County	No feasible mitigation measure.		X	2.6%
41	El Camino Real / Ravenswood Rd	Menlo Park	Contribute fair share funding toward the conversion of the northbound right-turn lane to a shared through/right-turn lane.		X	5.1%
56	Alma St / Hamilton Ave	Palo Alto	Contribute fair share funding toward the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, by removing a portion of the parking.		X	2.4%
58	Alma St / Charleston Rd	Palo Alto	Contribute fair share funding toward the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements.	X		1.8%

NOTE:

[a] The fair-share contribution is estimated based on the total number of proposed Additional Housing Alternative B reverse-commute direction trips at the intersection divided by the difference between the total cumulative intersection volume and the existing intersection volume. The value presented in this table represents the maximum percentage of the AM and PM peak hours if both peak hours are impacted; the AM percentage if only the AM peak hour is impacted, and the PM percentage if only the PM peak hour is impacted. Additional calculations are provided in Appendix RCA. It should be noted that these percentages are projected based on Baseline and Cumulative projects known at this time, and are subject to change if new projects (i.e., projects not included in Baseline and/or Cumulative analysis scenarios) that would add volumes to the study intersections are approved prior to issuance of the first building permit authorized under the 2018 General Use Permit.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by a project (in this case, Additional Housing Alternative B), the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are evaluated below. In all cases, these effects of mitigation are determined to be less than significant.

- **Intersection #2: Contribute fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report.***

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #13: Contribute fair-share funding to the installation of a traffic signal at the unsignalized intersection of I-280 Southbound Off-Ramp / Page Mill Road.**

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and requires additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the bicycle StreetScore+ QOS, as it would remain unchanged at QOS 3.7. There is no pedestrian access at this intersection.

  It is noted that Santa Clara County's *Page Mill Expressway Corridor Study Report* describes improvements along the length of Page Mill Road from the I-280 Southbound Ramps to El Camino Real. The improvement concept at the I-280 Southbound Ramps intersection is a roundabout with a traffic signal at the I-280 Northbound Ramps

intersection and a third eastbound and westbound through lane on Page Mill Road to the east of the I-280 Northbound Ramps intersection. The County would determine the ultimate improvement design and phasing for the corridor improvements. Additional Housing Alternative B's fair-share funding contribution identified for Intersection #13 may be applied toward a roundabout at the I-280 Southbound Ramps intersection if the County chooses, and the timing of this improvement would also be determined by the County.

Intersection #17: Contribute fair-share funding to the addition of a third westbound through lane on Page Mill Road and a receiving lane on the west leg of the intersection (resulting in three westbound lanes from Junipero Serra Boulevard to approximately Old Page Mill Road); installation of an overlap signal phase for northbound, southbound, and westbound right-turning vehicles; and widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane.

This mitigation differs from the mitigation under the proposed Project. For the proposed Project, the impact at this intersection would be reduced to a less-than-significant level with the following mitigation: Contribute fair share funding toward:

(1) the addition of a third through lane on Page Mill Road in the westbound direction (for a total of two left-turn lanes, three through lanes, and a right-turn lane plus a bike lane);

(2) addition of a receiving lane to westbound Page Mill Road (resulting in three lanes from Junipero Serra Boulevard approximately to Old Page Mill Road); and

(3) installation of an overlap phase for northbound and southbound right-turning vehicles and widening of the southbound approach to two lanes between Page Mill Road and Stanford Avenue to align with the existing designated right-turn lane.[82]

For Additional Housing Alternative B, the impact at this intersection cannot be mitigated to a less-than-significant level with the mitigation measures identified for the proposed Project, and the additional mitigation described above (installation of an overlap phase for westbound right-turning vehicles) would be needed. Installation of the overlap phases would be accommodated through the modification of the existing traffic signal, which requires no additional right-of-way. Widening the southbound approach to two lanes between Page Mill Road and Stanford Avenue will likely require the acquisition of additional right-of-way. This improvement would allow southbound right-turning vehicles additional queuing space so southbound through vehicles do not block the right-turn lane. The new westbound improvements would require some right of way (10-12 feet) from the subdivision corner (northeast) and along the dish parcel for the receiving lane (northwest).

[82] The third improvement was identified as a mitigation measure in the Draft EIR. Two additional improvements have been added to ensure the impact is mitigated to a less-than-significant level under the assumption that Page Mill Road is four lanes, rather than six lanes as previously assumed.

Implementation of this mitigation measure would reduce the impact to a less-than-significant level under Cumulative (2035) conditions (discussion below), but would not reduce the impact to a less-than-significant level under Background (2018) conditions. In addition, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* to widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. The Tier 1 improvement is fully funded through Measure B, but conservatively is not anticipated to be in place by 2035. This was evaluated as a potential mitigation measure and was determined not bring the impact to a less-than-significant level under 2018 Conditions.

***Impacts of Mitigation*:** With the exception of construction-related impacts, the mitigation would not have a substantial adverse effect on bicycle and pedestrian QOS, which would remain at QOS 3.5 and 4.0, respectively.

- **Intersection #30: Contribute fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of-way would be required to construct this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound and southbound approaches would be reduced from the existing 6+ lanes to an estimated 2 to 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #58: Contribute fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  Impacts of Mitigation: The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection and remain unchanged on all other approaches while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on the northbound and southbound approaches. The proposed mitigation measure would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

  See **Table 7B.15-65** for mitigated LOS conditions.

Impact 7B.15-3: Implementation of Additional Housing Alternative B could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Additional Housing Alternative B conditions. (*Significant*)

Please note that only the freeway mainline segment impact analysis is provided for the Additional Housing Alternative B analysis. As described in Draft EIR page 5.15-58, freeway ramp queueing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions.

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Under 2018 Baseline with Additional Housing Alternative B Conditions, the following 6 freeway segments would meet the significance criteria, which is two more than under 2018 Baseline with Project Conditions:

TABLE 7B.15-6
2018 BASELINE WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2018 Baseline		2018 Baseline With Additional Housing Alternative B		Mitigation Measure	2018 Baseline With Additional Housing Alternative B (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**119.6** 21.2	**F** C+	**137.5** 21.8	**F** C+	See MM 7B.15-2(a) (Table 2B)	46.0 17.6	D B	LTS/SU
13	I-280 SB Ramps / Page Mill Road	Santa Clara County	LOS E (Warrant)	AM PM	**151.7** **85.9**	**F**	**153.5** **88.6**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	37.2 42.3	D+ D	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**97.2** **97.0**	**F** **F**	**104.7** **111.0**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	**100.4** **98.6**	**F** **F**	SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	71.8 **92.3**	E **F**	74.3 **95.4**	E **F**	See MM 7B.15-2(a) (Table 2B)	60.3 67.9	E E	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	**55.2** 55.0	**E+** D-	**55.9** **56.1**	**E+** **E+**	See MM 7B.15-2(a) (Table 2B)	54.8 55.0	D- D-	LTS/SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection; SU = significant and unavoidable.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour);
  - South De Anza Boulevard to Saratoga Avenue (PM peak hour);
- Northbound I-280
  - Magdalena Avenue to El Monte Road (AM peak hour).
- Southbound I-280
  - El Monte Road to Magdalena Avenue (PM peak hour).

There are limited options to widen these freeway segments due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 7B.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fees from exceeding the No Net New Commute Trips standard to alternative programs that reduce vehicular trips. Nevertheless, because it is uncertain whether the No Net New Commute Trips standard would be achieved, the freeway impacts under Additional Housing Alternative B would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable.

Impact 7B.15-4: Implementation of Additional Housing Alternative B would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. Similar to the proposed Project, Additional Housing Alternative B does not propose infrastructure changes outside the Project site and, thus, would not interfere with the ability of transit agencies to modify or expand service.

Additional Housing Alternative B would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 7B.15-7**, Additional Housing Alternative B would not add substantial delays relative to the total route travel time to any of the transit routes assessed, although delays are sometimes higher than proposed Project delays. The additional delay would be fewer than 30 seconds on all but one of the routes, and fewer than 60 seconds on all of the routes. Therefore, Additional Housing Alternative B's impact on transit services would be less than significant, as would the proposed Project.

TABLE 7B.15-7
BACKGROUND (2018) WITH ADDITIONAL HOUSING ALTERNATIVE B TRANSIT ROUTE DELAY [a]

Route		Direction	Peak Hour	Additional Route Average Delay (seconds)[b]	
				Proposed Project [c]	Additional Housing Alternative B
22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM PM	< 5.0 14.3	< 5.0 17.9
		Westbound	AM PM	10.9 7.0	12.1 6.6
35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
102	South San Jose to Palo Alto	Northbound	AM	< 5.0	< 5.0
		Southbound	PM	7.1	13.0
104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0	< 5.0
		Westbound	AM	14.4	29.9
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM PM	< 5.0 16.0	< 5.0 20.6
		Westbound	AM PM	10.9 7.0	12.1 6.6
281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM PM	5.1 < 5.0	< 5.0 5.5
		Westbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
		Southbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
		Westbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM PM	< 5.0 9.3	< 5.0 10.1
		Westbound	AM PM	20.8 13.3	36.4 26.0
U	Fremont BART to Stanford Oval	Eastbound	PM	12.3	18.9
		Westbound	AM	< 5.0	< 5.0
E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM PM	< 5.0 5.3	< 5.0 6.2
		Westbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
		Westbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0

[a] Transit route delay is calculated by summing each transit route movements through the study intersections. Some movements may experience large increases or decreases in delay as a result of the analysis software (Traffix 8.0) redistributing green time for each phase.
[b] Additional Housing Alternative B was not considered to have a measureable change in overall transit route delay if the increase in travel time was less than five seconds or the travel time improved slightly (due to changes in signal timing, critical movement changes, etc.).
[c] Background (2018) With Proposed 2018 General Use Permit presents the results as it was included in the Draft EIR. These results are provided for comparison purposes only.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Mitigation: None required.

Impact 7B.15-5: Implementation of Additional Housing Alternative B would not substantially increase intrusion by traffic in nearby neighborhoods. (*Less than Significant*)

Traffic impacts on residential streets were estimated using the Traffic Infusion on Residential Environment (TIRE) methodology, which empirically determines the potential impact on residential streets based on the premise that any increase in traffic that would cause an index increase of 0.1 or more would be noticeable to residents. The TIRE index is based on a logarithmic scale, and is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling, or playing. The TIRE indices values range from zero (representing the least noticeable effect on traffic) to five (representing the most severe effect).

Similar to what was analyzed for the proposed Project, two neighborhoods in Palo Alto (College Terrace and Crescent Park) were identified as locations where neighborhood traffic impacts might occur with the proposed growth in the 2018 General Use Permit, assuming the build-out of Additional Housing Alternative B for the following reasons:

- **College Terrace** – The neighborhood lies along the southern boundary of the campus and shares access with Stanford Avenue, which is a primary access route to the campus. Even though the traffic calming measures instituted in this neighborhood appear to have been effective, there remains a concern that there are routes through the neighborhood that drivers from Stanford might use to travel between Stanford Avenue and California Avenue to access Page Mill Road or El Camino Real.

- **Crescent Park** – The neighborhood lies along University Avenue, which is a major access route to regional roadways such as US 101 and SR 84 (Dumbarton Bridge), and is a road used by some drivers accessing Stanford. There is existing congestion on the corridor that includes spillover traffic to parallel roadways such as Hamilton Avenue.

TIRE Indices on Local Streets

Given that travel patterns throughout and surrounding the Stanford campus may change with Additional Housing Alternative B, variations to the methodology used for the proposed Project were used to calculate the total number of daily trips that may divert through the College Terrace and Crescent Park neighborhoods. Separate approaches were used to estimate the number of diverted daily trips for the two neighborhoods. For the College Terrace neighborhood, a ratio was developed between the number of peak hour trips accessing the University via Bowdoin Street and the total number of daily trips under the proposed Project conditions. This ratio was applied to the new number of peak hour trips using Bowdoin Avenue to determine the new number of daily trips that would potentially cut through the College Terrace neighborhood. This method was also applied to vehicle trips along University Avenue to estimate the number of daily trips that would potentially cut through the Crescent Park neighborhood.

College Terrace TIRE Analysis

As shown in **Table 7B.15-8**, TIRE indices for the local streets serving Stanford in the College Terrace neighborhood currently range from 2.6 to 3.1. Applying the ratio described above yields an estimate that 1,935 daily vehicles would use Bowdoin Street to access Stanford University for Additional Housing Alternative B.

TABLE 7B.15-8
COLLEGE TERRACE NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Volume that Equates to 0.1 Change[a]	Project Daily Trips[b]	Additional Housing Alt. B Trips[b]	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index				
Columbia Street, between College Avenue and California Avenue	2	640	2.8	140	57	58	No
Hanover Street, between Stanford Avenue and College Avenue	2	1,160	3.1	290	76	77	No
Harvard Street, between Stanford Avenue and College Avenue	2	430	2.6	97	28	29	No
Oberlin Street, between Stanford Avenue and College Avenue	2	850	2.9	170	55	57	No
Princeton Street, between College Avenue and California Avenue	2	610	2.8	140	54	55	No
Cornell Street, between College Avenue and California Avenue	2	370	2.6	97	33	33	No

[a] Minimum daily traffic volume increase to produce an impact.
[b] Assumes 20% of the added daily Stanford traffic east of Bowdoin Street on Stanford Avenue.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Many of the daily trips that access the Stanford campus at Bowdoin Street do not pass through the College Terrace neighborhood, as there is a barrier at the entrance to the College Terrace neighborhood at Bowdoin Street, and all vehicles entering or exiting the campus at Bowdoin Street must also use Stanford Avenue. Vehicles traveling to or from the campus by way of the portion of Stanford Avenue that is to the west of Bowdoin Street do not pass through the College Terrace neighborhood. Vehicles traveling to or from the campus by way of the portion of Stanford Avenue that is to the east of Bowdoin Street can continue on Stanford Avenue directly to El Camino Real. These vehicles also do not pass through the College Terrace neighborhood. The only vehicles that travel through the College Terrace neighborhood are those that zig zag through the neighborhood by taking College Avenue or California Avenue to and from El Camino Real, or by taking Hanover Street to or from Page Mill Road. Vehicles cannot travel directly from Stanford Avenue to Page Mill Road on Hanover Street; there is a barrier at the intersection of California Avenue and Hanover Street that prevents through traffic.

Morning and afternoon peak period turning movement counts collected at the Bowdoin Street / Stanford Avenue intersection were used to estimate trip distribution along Stanford Avenue. Of the 1,935 additional daily trips accessing the campus at Bowdoin Street, it is estimated that 650 daily trips would travel on Stanford Avenue to the east of Bowdoin Street, thereby having the potential to pass through the College Terrace neighborhood.

Existing daily traffic volumes collected throughout the College Terrace neighborhood where Stanford traffic may use neighborhood streets were used to estimate trip distribution throughout College Terrace neighborhood. Due to the existing street closures and traffic calming devices, relatively few drivers are likely to choose to negotiate the circuitous route, as well as multiple stop signs and speed humps, to pass through the neighborhood to access El Camino Real; the alternative (Stanford Avenue) is a direct route to El Camino Real with fewer stops. Similarly, it is unlikely that a large number of drivers would choose to travel from Stanford Avenue to Page Mill Road through the College Terrace neighborhood given that multiple turns and out-of-way travel would be needed. For example, if a driver were to leave the campus at Bowdoin Street, they would need to turn left on Stanford Avenue, right on Hanover Street, right on College Avenue, left on Columbia Street and left on California Avenue to access Page Mill Road. The other options would be to use Stanford Avenue to access Peter Coutts to Junipero Serra Boulevard, or El Camino Real to access Page Mill Road.

While the traffic calming and circuitous routing minimizes the number of drivers electing to cut through the neighborhood, the analysis assumed (based on professional judgment and knowledge of the neighborhood traffic calming and routing) that approximately 20 percent of drivers who travel to and from the Stanford gateway via the east of Bowdoin Street might elect to pass through the neighborhood streets. Because the TIRE index is based on daily traffic volumes, and the greatest time savings for drivers cutting through the neighborhood would be during the morning or evening peak periods when El Camino Real, Page Mill Road and Junipero Serra Boulevard are congested, the 20 percent assumption is considered conservative.

While it is unlikely that even 20 percent of the added daily Stanford traffic traveling east of Bowdoin Street on Stanford Avenue would travel through the neighborhood, this percentage was used to demonstrate a conservatively-high analysis scenario. Additional Housing Alternative B trip estimates along Oberlin Street, Harvard Street, Hanover Street, Cornell Street, Princeton Street, and Columbia Street were distributed based on the relative existing daily volumes on these roadways. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in Table 7B.15-8, Additional Housing Alternative B would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact on local streets, although higher than the proposed Project impact, would be less than significant, the same as the result of the analysis of the proposed 2018 General Use Permit.

Crescent Park TIRE Analysis

The percentage of trips using University Avenue that would be likely to divert to neighborhood roadways when passing through Downtown Palo Alto was calculated. The potential diversion of this volume to parallel routes within the Crescent Park neighborhood was based on an analysis of

the relative existing daily traffic volumes on University Avenue, Lytton Avenue, and Hamilton Avenue for four different segments: east of Middlefield Road, west of Lincoln Avenue, east of Lincoln Avenue, and west of Woodland Avenue. The existing daily traffic volumes along each roadway in each segment were used to estimate potential daily trip distributions. For example, if the Stanford 2018 General Use Permit is estimated to contribute 15 trips on University Avenue, while University Avenue has an existing 100 daily trips and Hamilton Avenue has an existing 50 trips, then 10 additional Stanford trips would be assumed to use University Avenue and five trips would be assumed to use Hamilton Avenue. The estimated potential daily trip distributions of Additional Housing Alternative B trips in Crescent Park neighborhood are shown in **Table 7B.15-9**. These values were compared to the volume changes needed to create a 0.1 TIRE index increase for each roadway to ascertain whether an impact would result. As shown in **Table 7B.15-10**, TIRE indices for the local streets serving Stanford in the Crescent Park neighborhood currently range from 3.5 to 3.7, and Additional Housing Alternative B would not surpass the 0.1 change in TIRE index on any of the local residential street segments evaluated in this analysis, and the impact on local streets, although higher than the proposed Project impact, would be less than significant, the same as the result of the analysis of the proposed 2018 General Use Permit.

It should be noted that since the TIRE indices are based on the effect of Additional Housing Alternative B as a percentage of total traffic, that Alternative's A effect on cumulative traffic conditions would be even less, and similarly less than significant.

Mitigation: None required.

Impact 7B.15-6: Implementation of Additional Housing Alternative B would not substantially increase hazards due to a design feature or incompatible uses. (*Less than Significant*)

The potential safety impacts of Additional Housing Alternative B are evaluated based on whether any identified intersection mitigation measures would cause adverse safety effects for vehicles, transit, pedestrians, or bicyclists, and if Additional Housing Alternative B would introduce incompatible uses (i.e., types of vehicles that differ from those currently on area roadways). The intersection mitigation measures would be constructed according to the design standards of the relevant jurisdiction/agency (i.e., where the intersection is located), which conform to industry standards for roadway and intersection design and operations. In addition, the secondary effects of the intersection mitigations on pedestrians and bicyclists are described for each mitigation measure (Impact 7B.15-2, above, and Impact 7B.15-9, below). Lastly, the mix of vehicles on area roadways (trucks, autos, etc.) would not materially change from existing conditions. Therefore, the mitigation measures and increased traffic would not cause adverse safety effects for vehicles, transit, pedestrians or bicyclists under Additional Housing Alternative B and cumulative conditions, and impact of Additional Housing Alternative B on safety is less-than-significant.

TABLE 7B.15-9
CRESCENT PARK NEIGHBORHOOD TRIP DISTRIBUTION CALCULATIONS

Roadway Description		Average Daily Traffic	Percent of Total Volumes	Estimated Daily Trips
Cordon 1	University Avenue East of Middlefield Road	20,640	71%	739
	Lytton Avenue East of Middlefield	2,940	10%	105
	Hamilton Avenue East of Middlefield Road	5,580	19%	200
	Total for Cordon 1	***29,160***	***100%***	***1,044***
Cordon 2	University Avenue West of Lincoln Avenue	19,500	84%	878
	Hamilton Avenue West of Lincoln Avenue	3,700	16%	167
	Total for Cordon 2	***23,200***	***100%***	***1,044***
Cordon 3	University Avenue East of Lincoln Avenue	20,920	86%	898
	Hamilton Avenue East of Lincoln Avenue	3,400	14%	146
	Total for Cordon 3	***24,320***	***100%***	***1,044***
Cordon 4	University Avenue Wes of Woodland Avenue	24,890	100%	1,044
	Total for Cordon 4	***24,890***	***100%***	***1,044***

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

TABLE 7B.15-10
CRESCENT PARK NEIGHBORHOOD TIRE INDEX RESULTS

Segment	Existing Conditions			Volume that Equates to 0.1 Change[a]	Project Daily Trips	Additional Housing Alt. B Trips	Surpass the 0.1 Threshold?
	Lanes	Daily Traffic Volume	TIRE Index				
Lytton Avenue, between Middlefield Road and Fulton Street	2	2,940	3.5	825	76	105	No
Hamilton Avenue, between Middlefield Road and Fulton Street	2	5,580	3.7	1,250	145	200	No
Hamilton Avenue, between Hamilton Court and Lincoln Avenue	2	3,700	3.6	1,025	121	167	No
Hamilton Avenue, between Lincoln Avenue and Crescent Drive	2	3,400	3.5	825	106	146	No

[a] Minimum daily traffic volume increase to produce an impact.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

It is also noted that Stanford's proposed mitigation approach aims to eliminate congestion impacts and the need for the intersection mitigation measures. The approach includes a combination of trip reduction measures for trips to and from the Stanford campus, and trip reduction measures for trips outside the Project site within the impact area, incorporating both infrastructure projects and programs supporting non-auto modes. If successful, this approach would avoid the need to construct any of the intersection capacity mitigations.

Mitigation: None required.

Impact 5.15-7: Implementation of Additional Housing Alternative B would not result in inadequate emergency access. (*Less than Significant*)

Emergency access can be impeded as a result of the construction of physical features that can block emergency access routes or make them more circuitous, or as a result of high levels of congestion that lengthen the response time of emergency providers. Additional Housing Alternative B would not result in any infrastructure changes outside the Project site, and thus would not create fixed physical barriers to, or impede, emergency access. The Additional Housing Alternative B traffic analyses (Impact 7B.15-2, above, and Impact 7B.15-9, below) indicate significant impacts (increased congestion/delays) at intersections in both the 2018 with Additional Housing Alternative B and 2035 Cumulative with Additional Housing Alternative B conditions. As described in Impacts 7A.15-2 and Impact 7A.15-9, Additional Housing Alternative B would incrementally increase congestion/delays compared to the proposed Project, but similar to the Project, identifies intersection capacity mitigations, if feasible. Emergency responders are charged with developing fastest-response travel routes and assessing traffic conditions and developing alternate routes in real time to provide emergency services. Therefore, the identified significant impacts at area intersections would not result in inadequate emergency access within the traffic study area, and the impact on emergency access under Additional Housing Alternative B and cumulative conditions, and although effects would be incrementally greater than the proposed Project's impact, would be less-than-significant.

Mitigation: None required.

Impact 7B.15-8: Implementation of Additional Housing Alternative B would not conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

A significant impact to bicycle or pedestrian facilities could occur when Additional Housing Alternative B would create a hazardous condition that currently does not exist for pedestrians or bicyclists, or conflicts with planned facilities or local agency policies regarding bicycle and pedestrian facilities. Additional Housing Alternative B would not result in any infrastructure changes outside the Project site and would preclude implementation of planned bicycle or

pedestrian facilities, and thus, would not create hazardous conditions where none exist today, nor conflict with planned facilities or local agency policies.

However, several intersection capacity mitigation measures are identified (for Impact 7B.15-2, above, and Impact 7B.15-9, below). Therefore, the analysis of potential impacts also focuses on the proposed mitigations, as these could be effects of Additional Housing Alternative B if they are constructed. The analysis of each mitigation location also includes the effect of the daily traffic volume with the additional trips generated by Additional Housing Alternative B. The analysis found that the identified intersection improvements would not substantially affect quality of service for pedestrians and bicyclists (i.e., no substantial worsening of QOS indices) in all but two cases. At one Cumulative (2035) mitigation location, Middlefield Road / Marsh Road (Intersection #59), the bicycle quality of service would decrease from QOS 2.7 to QOS 3 (the same result as under the Cumulative (2035) with Project Conditions).

While the rest of the traffic mitigation measures do not change the quality of service index at the mitigation location, in some cases the mitigations do add another vehicle lane to cross or navigate as a bicyclist. However, these changes do not affect the QOS rating because it is already at 4 (the worst rating). In several cases, the mitigation measures may result in a slight improvement for bicyclists by removing a right-turn conflict zone due to re-striping. As noted in the traffic mitigation discussions, the implementation of the traffic mitigation measures would ultimately be the decision of the responsible jurisdiction, and considerations for bicyclist and pedestrian comfort and convenience may enter into those decisions, resulting in a modified improvement project that adds or enhances pedestrian and/or bicycle facilities, or rejection of the improvement project.

In some cases, the mitigations would add another vehicle lane to cross or navigate as a bicyclist. However, these changes would not affect the QOS rating because it is already at 4 (the worst rating). As noted in the traffic mitigation discussions, the implementation of the mitigation measures would ultimately be the decision of the responsible jurisdiction, and considerations for bicyclist and pedestrian comfort and convenience may enter into those decisions, resulting in a modified improvement that adds or enhances pedestrian and/or bicycle facilities, or rejection of the identified mitigation measure.

In addition, assessment of the bicycle facility capacity to serve future growth in bicycle commuters to the campus (based on existing bicycle counts at the campus gateways and estimates of future growth to 2018 and 2035 under the proposed 2018 General Use Permit) shows that the carrying capacities of bicycle paths and lanes in the various “bike shed” areas surrounding the campus exceed the estimated future growth in bicycle volumes.

For the above reasons, the impact of Additional Housing Alternative B on pedestrian and bicycle facilities under Additional Housing Alternative B and cumulative conditions, and although effects would be incrementally greater than the proposed Project’s impact, would be less than significant.

Separate from the above analysis, it is noted that under Additional Housing Alternative B, like the proposed Project, Stanford would construct improvements on its lands in unincorporated Santa Clara County that have been identified by the Palo Alto Unified School District (PAUSD) and the

City of Palo Alto as the Suggested Routes to Schools shown on the Walkabout Maps for Nixon and Escondido Elementary Schools. These improvements would benefit both pedestrian and bicycle circulation in the immediate area of both schools. Circulation improvements on Stanford lands in unincorporated Santa Clara County, in and around Nixon Elementary School, could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, and wayfinding signs. Circulation improvements in and around Escondido Elementary School similarly could include such items as improved crosswalks with high-visibility yellow markings, pavement markings, additional signage, additional traffic control. Specific improvements on Stanford property could include an enhanced mid-block crosswalk on Escondido Road.

Mitigation: None required.

Cumulative Impacts

2035 Baseline With Additional Housing Alternative B Conditions

Impact 7B.15-9: Implementation of Additional Housing Alternative B, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Additional Housing Alternative B conditions. (*Significant*)

The results for the Cumulative (2035) No Project and 2035 Cumulative With Proposed Project conditions have been updated since publication of the Draft EIR to correct the assumed lane configuration on Page Mill Road under cumulative conditions. Modeling conducted for the Draft EIR assumed Page Mill Road would have six travel lanes based on VTA's 2040 traffic model. Subsequently, VTA staff indicated that inclusion of the 6-lane configuration had been an error on the part of VTA.[83] The updated results are based on modeling that assumes no change to the existing 4-lane configuration for Page Mill Road. [84]

Cumulative impacts associated with Additional Housing Alternative B are identified by comparing 2035 Cumulative (no project) to 2035 Cumulative with Additional Housing Alternative B Conditions. Significant impacts are identified based on the applicable impact criteria, which include changes in the LOS from an acceptable to an unacceptable level or changes in critical delay and critical V/C ratios for intersections operating unacceptably. The results of the LOS analysis are summarized in **Table 7B.15-11**. The results for 2035 Cumulative No Project and 2035 Cumulative With Proposed Project (2018 General Use Permit) conditions are included in Table 7B.15-11 for comparison purposes.

[83] Email dated 10/3/17 from George Naylor (Santa Clara County VTA) to Ananth Prasad (Santa Clara County Roads and Airports), forwarded via Dave Rader (Santa Clara County Planning Department) to Ellen Poling (Fehr & Peers) on 10/19/18.

[84] This updated results will also be reflected in the forthcoming Response to Comments Document.

TABLE 7B.15-11
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
1	I-280 NB On-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.3 12.6	B+ B	10.1 13.7	B+ B	0.015 0.032	-0.2 1.2	10.1 13.7	B+ B	0.021 0.032	-0.2 1.2
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**155.2** 18.6	**F** B-	**0.038** 0.021	**19.2** 0.2	**155.1** 19.0	**F** B-	**0.038** 0.029	**19.2** 0.6
3	Addison Wesley / Sand Hill Rd	Menlo Park	LOS D	AM PM	37.9 21.5	D+ C+	49.6 22.3	D C+	0.037 0.032	18.3 1.4	48.6 22.2	D C+	0.034 0.032	17.0 1.4
4	Saga Ln / Sand Hill Rd	Menlo Park	LOS D	AM PM	19.4 30.1	B- C	19.6 29.8	B- C	0.036 0.031	0.5 -0.2	19.7 29.7	B- C	0.033 0.031	0.4 -0.2
5	Sharon Park Dr / Sand Hill Rd	Menlo Park	LOS D	AM PM	17.4 18.9	B B-	17.4 18.6	B B-	0.036 0.032	0.3 0.0	17.3 18.6	B B-	0.033 0.032	0.3 0.0
6	Alameda de las Pulgas / Santa Cruz Ave	San Mateo County	LOS D	AM PM	13.3 14.6	B B	13.3 14.5	B B	0.000 0.000	0.0 0.0	13.3 14.5	B B	0.000 0.000	0.0 0.0
7	Santa Cruz Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	51.3 46.2	D- D	52.8 47.2	D- D	0.030 0.038	2.1 1.7	53.3 47.3	D- D	0.035 0.037	2.8 1.5
8	Oak Ave / Sand Hill Rd	Menlo Park	LOS D	AM PM	10.5 3.9	B+ A	10.5 3.9	B+ A	0.025 0.024	0.1 0.1	10.4 3.9	B+ A	0.028 0.029	0.1 0.2
9	Stock Farm Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	24.3 29.4	C C	25.4 30.3	C C	0.028 0.022	1.7 0.9	25.0 29.7	C C	0.029 0.009	1.4 2.4
10	Pasteur Dr / Sand Hill Rd	Palo Alto	LOS D	AM PM	20.7 26.8	C+ C	20.8 27.4	C+ C	0.009 0.017	0.4 0.7	20.6 27.2	C+ C	0.015 0.023	0.3 0.6
11	Arboretum Rd / Sand Hill Rd	Palo Alto	LOS D	AM PM	25.3 31.7	C C	26.0 32.3	C C-	0.013 0.012	1.3 0.9	27.0 33.0	C C-	0.026 0.017	2.9 1.4
12	El Camino Real / Sand Hill Rd	Palo Alto (SC CMP)	LOS E	AM PM	43.8 39.8	D D	43.6 40.3	D D	0.019 0.013	-3.1 0.6	43.7 40.4	D D	0.021 0.017	-2.9 0.9
13	I-280 SB Ramps / Page Mill Rd**	Santa Clara County	LOS E (warrant)	AM PM	37.0 44.6	D+ D	37.2 45.0	D+ D	0.003 0.003	0.3 0.2	37.3 44.7	D+ D	0.003 0.001	0.3 0.1
14	I-280 NB Ramps / Page Mill Rd**	Santa Clara County	LOS E (warrant)	AM PM	15.2 12.4	B B	14.5 12.5	B B	0.005 0.004	0.6 0.7	15.3 12.6	B B	0.005 0.005	0.6 0.9
15	Deer Creek Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	17.5 11.5	B B+	19.1 11.8	B- B+	0.026 0.021	2.7 0.1	19.1 11.9	B- B+	0.026 0.026	2.7 0.1
16	Coyote Hill Rd / Page Mill Rd	Santa Clara County	LOS E	AM PM	8.9 8.5	A A	9.8 8.9	A A	0.014 0.021	0.0 -0.1	9.8 8.9	A A	0.020 0.026	0.0 -0.1
17	Junipero Serra Blvd - Foothill Expy / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**186.9** **175.2**	**F** **F**	**0.028** **0.044**	**4.5** **27.8**	**191.0** **176.4**	**F** **F**	**0.043** **0.049**	**9.8** **29.0**

TABLE 7B.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
18	Peter Coutts / Page Mill Rd	Santa Clara County	LOS E	AM PM	22.3 30.5	C+ C	22.9 30.8	C+ C	0.020 0.015	0.8 0.0	23.3 31.2	C C	0.029 0.024	1.3 0.4
19	Hanover St / Page Mill Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**92.1** 52.8	**F** D-	**0.025** 0.018	**11.2** 0.6	**94.3** 60.1	**F** E	**0.039** 0.128	**14.7** 11.5
20	El Camino Real / Page Mill Rd - Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**84.9** **90.2**	**F** **F**	**0.047** **0.035**	**13.2** **11.0**	**88.1** **94.1**	**F** **F**	**0.077** **0.058**	**28.1** **18.4**
21	Middlefield Rd / Oregon Expy	Santa Clara County (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.6** **103.6**	**F** **F**	**0.014** **0.012**	**4.7** **3.1**	**125.5** **103.5**	**F** **F**	**0.015** **0.014**	**4.5** **2.7**
22	Oregon Expy / West Bayshore Rd	Santa Clara County	LOS E	AM PM	23.4 20.8	C C+	23.4 21.0	C C+	0.003 0.008	0.0 0.1	23.5 21.1	C C+	0.007 0.012	0.1 0.4
23	I-280 SB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	10.5 2.1	E C	42.7 16.9	E C	N/A	N/A	42.6 16.8	E C	N/A	N/A
24	I-280 NB Ramps / Alpine Rd*	San Mateo County	LOS E (warrant)	AM PM	26.7 29.1	D D	27.8 32.5	D D	N/A	N/A	28.1 32.7	D D	N/A	N/A
25	Junipero Serra Blvd / Alpine Rd	Menlo Park	LOS D	AM PM	48.1 50.6	D D	51.6 52.8	D- D-	0.049 0.029	4.6 1.7	51.4 52.7	D- D-	0.045 0.030	4.2 1.7
26	Junipero Serra Blvd / Campus Drive West	Santa Clara County	LOS E	AM PM	30.1 44.1	C D	32.5 50.3	C- D	0.009 0.043	1.5 8.6	33.4 49.7	C- D	0.025 0.036	4.0 6.8
27	Junipero Serra Blvd / Campus Drive East	Santa Clara County	LOS E	AM PM	14 17.8	B B	14.4 19.5	B B-	0.020 0.037	0.7 2.8	14.4 19.4	B B-	0.028 0.042	0.8 2.6
28	Junipero Serra Blvd / Stanford Ave	Santa Clara County	LOS E	AM PM	20.6 24.9	C+ C	22.4 29.9	C+ C	0.061 0.084	2.5 6.8	22.9 30.6	C+ C	0.071 0.093	3.3 7.5
29	Foothill Expy / Hillview Ave	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**135.0** 64.2	**F** E	**0.024** 0.015	**16.1** 9.0	**133.5** 63.7	**F** E	**0.031** 0.014	**13.5** 8.3
30	Foothill Expy / Arastradero Rd	Santa Clara County (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**201.2** **208.9**	**F** **F**	**0.016** **0.095**	**10.4** **18.2**	**200.8** **208.4**	**F** **F**	**0.015** **0.093**	**9.8** **17.0**
31	Foothill Expy / San Antonio Rd	Santa Clara County (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	43.2 **171.0**	D **F**	0.016 **0.021**	6.7 **8.1**	42.7 **170.4**	D **F**	0.014 **0.019**	5.8 **7.3**
32	Foothill Expy / El Monte Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**149.3** **137.9**	**F** **F**	**0.014** 0.004	**13.5** 1.9	**148.5** **137.4**	**F** **F**	**0.013** 0.003	**11.9** 1.5
33	Foothill Expy / Springer Road-Magdalena Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.9** **154.4**	**F** **F**	**0.014** **0.010**	**4.8** **5.1**	**131.8** **154.5**	**F** **F**	**0.013** **0.009**	**4.7** **5.2**
34	Bowdoin St / Stanford Ave*	Palo Alto	LOS E (warrant)	AM PM	16.7 25.8	C D	22.8 43.2	C E	N/A	N/A	23.1 46.2	C E	N/A	N/A

TABLE 7B.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
35	Arboretum Rd / Quarry Rd	Palo Alto	LOS D	AM PM	46.8 43.3	D D	47.5 44.2	D D	0.040 0.039	1.3 1.8	48.4 45.4	D D	0.077 0.074	3.2 3.5
36	Arboretum Rd / Palm Dr	Palo Alto	LOS D	AM PM	31 31.1	C C	32.4 32.5	C- C-	0.080 0.049	2.1 2.5	32.9 33.6	C- C-	0.096 0.070	3.0 3.6
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.4 **92.9**	D **F**	0.007 **0.015**	1.4 **5.5**	45.6 **92.7**	D **F**	0.008 **0.014**	1.8 **5.2**
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 **57.4**	D- **E+**	0.017 **0.015**	1.9 **2.7**	54.0 **57.3**	D- **E+**	0.016 **0.015**	1.7 **2.5**
39	El Camino Real / Oak Grove Ave	Menlo Park	LOS D	AM PM	34.4 39.0	C- D+	34.1 38.9	C- D+	0.018 0.017	-0.2 0.0	34.1 38.9	C- D+	0.016 0.016	-0.2 0.0
40	El Camino Real / Santa Cruz Ave	Menlo Park	LOS D	AM PM	26.8 35.5	C D+	26.5 35.5	C D+	0.018 0.010	-0.1 0.0	26.7 35.5	C D+	0.016 0.011	-0.1 0.0
41	El Camino Real / Ravenswood Rd	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.7 **65.8**	D **E**	0.008 **0.020**	1.0 **3.8**	48.8 **66.1**	D **E**	0.012 **0.020**	1.4 **3.9**
42	El Camino Real / Roble Ave	Menlo Park	LOS D	AM PM	12.8 15.3	B B	12.7 15.2	B B	0.006 0.009	-0.1 -0.1	12.7 15.1	B B	0.008 0.010	-0.1 -0.2
43	El Camino Real / Middle Ave	Menlo Park	LOS D	AM PM	25.1 28.5	C C	24.9 28.3	C C	0.014 0.009	-0.2 0.1	24.9 28.4	C C	0.013 0.010	-0.2 0.1
44	El Camino Real / Cambridge Ave	Menlo Park	LOS D	AM PM	15.2 24.8	B C	15.0 24.8	B C	0.014 0.009	-0.2 0.2	15.0 24.8	B C	0.013 0.010	-0.2 0.2
45	El Camino Real / Quarry Rd	Palo Alto	LOS D	AM PM	11.9 33	B+ C-	13.3 34.8	B C-	0.029 0.032	1.6 2.7	14.1 35.8	B D+	0.036 0.048	2.4 4.3
46	El Camino Real (SB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	21 22.7	C+ C+	20.7 22.5	C+ C+	0.016 0.031	-0.1 0.0	20.6 22.4	C+ C+	0.026 0.036	-0.2 0.2
47	El Camino Real (NB) / University Ave	Palo Alto (SC CMP)	LOS E	AM PM	27.3 25.2	C C	28.6 26.1	C C	0.008 0.016	0.5 0.7	27.8 26.3	C C	-0.007 0.016	-1.6 0.6
48	El Camino Real / Embarcadero Rd	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	60.4 **82.2**	E **F**	0.032 **0.059**	5.2 **20.0**	62.1 **86.2**	E **F**	0.052 **0.078**	8.9 **27.4**
49	El Camino Real / Churchill Ave	Palo Alto	LOS D	AM PM	25.4 26.7	C C	25.4 26.6	C C	0.017 0.018	0.1 0.1	25.4 26.7	C C	0.028 0.032	0.3 0.3
50	El Camino Real / Serra St	Palo Alto	LOS D	AM PM	24.6 29.3	C C	28.3 36.1	C D+	0.082 0.111	6.1 10.7	30.2 38.8	C D+	0.118 0.149	8.3 15.3
51	El Camino Real / Stanford Ave	Palo Alto	LOS D	AM PM	31.1 32.2	C C-	31.7 34.7	C C-	0.033 0.054	1.0 3.9	31.7 35.2	C D+	0.051 0.065	1.0 4.7

TABLE 7B.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
52	El Camino Real / California Ave	Palo Alto	LOS D	AM PM	22.8 27.8	C+ C	22.1 27.5	C+ C	0.029 0.031	-0.4 0.0	22.0 27.5	C+ C	0.033 0.039	-0.5 0.0
53	El Camino Real / Arastradero Rd - Charleston Rd	Palo Alto (SC CMP)	LOS E	AM PM	67.1 68.7	E E	70.2 70.3	E E	0.020 0.019	5.5 3.8	70.6 70.4	E E	0.023 0.021	6.3 4
54	El Camino Real / San Antonio Rd	Mountain View (SC CMP)	LOS E	AM PM	60.8 55.6	E E+	61.3 55.7	E E+	0.008 0.007	0.8 0.0	61.2 55.7	E E+	0.007 0.007	0.8 0.0
55	Alma St / Lytton Ave	Palo Alto	LOS D	AM PM	28.2 25.9	C C	30.9 27.1	C C	0.017 0.015	4.1 1.9	31.6 27.9	C C	0.022 0.023	5.3 3.0
56	Alma St / Hamilton Ave	Palo Alto	LOS D	AM PM	10.2 57.7	B+ E+	10.4 **60.0**	B+ **E**	0.007 **0.012**	0.3 **5.0**	10.5 **62.0**	B+ **E**	0.012 **0.021**	0.4 **8.8**
57	Alma St / Churchill Ave	Palo Alto	LOS D	AM PM	32.4 **59.2**	C- **E+**	32.5 **59.8**	C- **E+**	0.005 **0.006**	0.2 **1.0**	32.7 **60.0**	C- **E**	0.006 **0.008**	0.4 **1.4**
58	Alma St / Charleston Rd	Palo Alto	LOS D	AM PM	**123.4** **121.5**	**F** **F**	**127.3** **126.7**	**F** **F**	**0.009** **0.017**	**3.9** **6.6**	**128.3** **127.6**	**F** **F**	**0.012** **0.019**	**5.1** **7.5**
59	Middlefield Rd / Marsh Rd	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.7** **77.4**	**E-** **E-**	**0.012** **0.000**	**4.6** **0.0**	**79.8** **77.5**	**E-** **E-**	**0.012** **0.000**	**4.8** **0.0**
60	Middlefield Rd / Ravenswood Ave	Menlo Park	LOS D	AM PM	49.3 45.3	D D	51.0 46.7	D D	0.011 0.012	2.1 1.9	51.3 47.1	D- D	0.012 0.015	2.4 2.4
61	Middlefield Rd / Ringwood Ave	Menlo Park	LOS D	AM PM	43.2 52.6	D D-	43.4 52.9	D D-	0.004 0.006	0.2 0.4	43.5 53.1	D D-	0.007 0.009	0.4 0.6
62	Middlefield Rd / Willow Rd	Menlo Park	LOS D	AM PM	50.0 53.0	D D-	50.2 53.4	D D-	0.000 0.006	0.0 0.5	50.2 53.5	D D-	0.000 0.008	0.0 0.7
63	Middlefield Rd / Lytton Ave	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.1 **70.1**	D- **E**	0.018 **0.017**	2.1 **4.4**	51.1 **70.4**	D- **E**	0.018 **0.018**	2.2 **4.8**
64	Middlefield Rd / University Ave	Palo Alto	LOS D	AM PM	35.1 39.4	D+ D	35.6 40.8	D+ D	0.019 0.031	0.5 2.0	35.6 40.8	D+ D	0.019 0.031	0.5 2.0
65	Middlefield Rd / Hamilton Ave	Palo Alto	LOS D	AM PM	10.5 10.8	B+ B+	10.6 10.9	B+ B+	0.005 0.007	0.1 0.1	10.5 10.9	B+ B+	0.005 0.008	0.0 0.1
66	Middlefield Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**59.4** **72.9**	**E+** **E**	**0.030** **0.025**	**5.8** **6.4**	**59.2** **73.1**	**E+** **E**	**0.029** **0.026**	**5.6** **6.6**
67	Saint Francis Dr / Embarcadero Rd	Palo Alto	LOS D	AM PM	23.0 19.3	C+ B-	23.0 19.1	C+ B-	0.015 0.014	0.2 -0.1	23.0 19.1	C+ B-	0.014 0.014	0.2 -0.1
68	E. Bayshore Rd / Embarcadero Rd	Palo Alto	LOS D	AM PM	**98.5** **77.7**	**F** **E-**	**99.0** **78.7**	**F** **E-**	**0.006** **0.004**	**0.5** **0.9**	**99.4** **79.0**	**F** **E-**	**0.007** **0.005**	**1.0** **1.2**

TABLE 7B.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
69	Middlefield Rd / Charleston Rd	Palo Alto	LOS D	AM PM	**58.0** **67.7**	**E+** **E**	**58.3** **68.5**	**E+** **E**	**0.004** **0.007**	**0.4** **1.6**	**58.3** **69.0**	**E+** **E**	**0.004** **0.010**	**0.3** **2.4**
70	US 101 SB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	**77.3** **78.0**	**E-** **E-**	**77.2** **77.9**	**E-** **E-**	**0.000** **0.000**	**0.0** **0.0**	**77.2** **77.9**	**E-** **E-**	**0.000** **0.000**	**0.0** **0.0**
71	US 101 NB Ramps / Marsh Rd	Menlo Park	LOS D	AM PM	23.2 41.1	C D	23.2 41.1	C D	0.000 0.000	0.0 0.0	23.2 41.1	C D	0.000 0.000	0.0 0.0
72	Bay Rd / Willow Rd	Menlo Park	LOS D	AM PM	19.7 11.3	B- B+	19.7 11.3	B- B+	0.008 0.006	0.1 0.1	19.8 11.3	B- B+	0.008 0.007	0.1 0.1
73	Newbridge St / Willow Rd	Menlo Park	LOS D	AM PM	42.7 53.6	D D-	42.7 53.9	D D-	0.005 0.004	0.1 0.6	42.7 54.0	D D-	0.006 0.006	0.1 0.9
74	O'Brien Dr / Willow Rd	Menlo Park	LOS D	AM PM	19.4 20.1	B- C+	19.4 20.0	B- C+	0.003 0.004	0.0 0.0	19.4 20.0	B- C+	0.005 0.005	0.1 0.0
75	Hamilton Ave / Willow Rd	Menlo Park	LOS D	AM PM	41.3 40.9	D D	42.0 41.1	D D	0.005 0.004	1.2 0.3	42.0 41.1	D D	0.006 0.005	1.3 0.4
76	Bayfront Expy / Willow Rd	Menlo Park (SM CMP)	LOS F	AM PM	51.1 64.9	D- E	51.1 65.3	D- E	0.000 0.004	0.0 0.6	51.0 65.4	D- E	0.000 0.004	0.0 0.7
77	Woodland Ave / University Ave	East Palo Alto	LOS D	AM PM	**71.7** **66.1**	**E** **E**	**72.7** **66.4**	**E** **E**	**0.000** **0.006**	**0.0** **0.9**	**72.7** **66.4**	**E** **E**	**0.000** **0.006**	**0.0** **0.9**
78	US 101 SB Ramps / University Ave	East Palo Alto	LOS D	AM PM	27.9 25.8	C C	28.0 25.8	C C	0.004 0.006	0.2 0.1	28.0 25.8	C C	0.004 0.006	0.2 0.1
79	Donohoe St / University Ave	East Palo Alto	LOS D	AM PM	**76.3** 43.4	**E-** D	**77.1** 43.5	**E-** D	**0.005** 0.004	**1.3** 0.1	**77.0** 43.5	**E-** D	**0.004** 0.004	**1.2** 0.1
80	University Ave / Bay Rd	East Palo Alto	LOS D	AM PM	54.1 51.8	D- D-	54.4 52.4	D- D-	0.005 0.009	0.5 1.1	54.3 52.5	D- D-	0.004 0.010	0.4 1.3
81	University Ave / Bayfront Expy	Menlo Park (SM CMP)	LOS F	AM PM	26.4 137.3	C F	26.6 140.0	C F	0.008 0.007	0.5 3.3	26.7 140.3	C F	0.009 0.008	0.6 3.8
82	Town & Country Driveway / Embarcadero Rd	Palo Alto	LOS D	AM PM	27.8 28.3	C C	27.2 27.9	C C	0.031 0.021	-0.4 -0.3	27.2 27.9	C C	0.030 0.026	-0.4 -0.3
83	Charleston Rd / San Antonio Rd	Palo Alto (SC CMP)	LOS E	AM PM	79.2 68.3	E- E	79.4 68.6	E- E	0.001 0.002	0.4 0.5	79.4 68.6	E- E	0.001 0.002	0.5 0.5
84	US 101 SB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	11.1 12.8	B+ B	11.2 12.8	B+ B	0.003 0.000	0.2 0.0	11.2 12.8	B+ B	0.002 0.000	0.2 0.0
85	US 101 NB Ramps / Willow Rd	Menlo Park	LOS D	AM PM	25 24.2	C C	25.1 24.2	C C	0.000 0.003	0.0 0.1	25.1 24.2	C C	0.000 0.004	0.0 0.1

TABLE 7B.15-11 (CONTINUED)
CUMULATIVE (2035) NO PROJECT AND WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative[d]		2035 Cumulative With Proposed Project[d]				2035 Cumulative With Additional Housing Alternative B			
					Delay[e]	LOS[f]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]	Delay[e]	LOS[f]	Δ in Crit. V/C[g]	Δ in Crit. Delay[h]
86	Central Expy / Rengstorff Ave	Santa Clara County (SC CMP)	LOS E	AM PM	**447.1** **248.1**	**F** **F**	**449.7** **250.5**	**F** **F**	**0.010** **0.008**	**2.2** **2.6**	**449.8** **250.7**	**F** **F**	**0.010** **0.009**	**2.1** **2.8**
87	Central Expy / Shoreline Blvd (N)	Santa Clara County (SC CMP)	LOS E	AM PM	**224.5** **97.4**	**F** **F**	**223.6** **97.1**	**F** **F**	**0.004** **0.006**	**0.2** **-0.1**	**223.4** **96.7**	**F** **F**	**0.005** **0.006**	**-0.5** **-1.0**
88	Central Expy / Shoreline Blvd (S)	Santa Clara County (SC CMP)	LOS E	AM PM	11.2 7.5	B+ A	11.2 7.5	B+ A	0.003 0.005	-0.1 0.0	11.2 7.5	B+ A	0.004 0.006	-0.1 0.0
89	Central Expy / Castro St-Moffett Blvd	Santa Clara County (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**243.7** **225.7**	**F** **F**	**0.010** **0.009**	**5.2** **4.5**	**243.9** **225.8**	**F** **F**	**0.009** **0.010**	**4.8** **4.5**
90	Foothill Expy / Edith Ave	Santa Clara County	LOS E	AM PM	55.9 **105.5**	E+ **F**	61.5 **112.6**	E **F**	0.016 **0.015**	10.2 **11.8**	60.8 **118.8**	E **F**	0.014 **0.013**	8.9 **10.6**
91	Foothill Expy / Main St	Santa Clara County (SC CMP)	LOS E	AM PM	44.6 54.8	D D-	49.9 55.8	D E+	0.016 0.009	8.5 -1.3	49.2 55.7	D E+	0.014 0.009	7.4 -1.3
92	University Ave / O'Brien Dr	Menlo Park	LOS D	AM PM	9.1 13.4	A B	9.1 13.3	A B	0.005 0.006	0.0 0.0	9.1 13.3	A B	0.005 0.006	0.0 0.0
93	University Ave / Adams Dr*	Menlo Park	LOS E (warrant)	AM PM	425.5 39.6	F[10] E	456.2 41.4	F[8] E	N/A	N/A	457.4 41.7	F[10] E	N/A	N/A
94	University Ave / Runnymede St	East Palo Alto	LOS D	AM PM	15.3 19.1	B B-	15.3 19.1	B B-	0.005 0.005	0.0 0.0	15.3 19.1	B B-	0.005 0.005	0.0 0.0
95	University Avenue / Bell Street	East Palo Alto	LOS D	AM PM	14.8 17.3	B B	14.7 17.2	B B	0.005 0.005	0.0 0.0	14.7 17.2	B B	0.005 0.005	0.0 0.0

NOTES: **Bold text** indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

In some cases, intersections may show a reduction in average delay with the addition of Project traffic, or with the addition of Additional Housing Alternative B traffic, which is counter-intuitive. However, average delay values are weighted averages, which will decrease when traffic is added to a vehicle movement that operates with low delay. Conversely, relatively small volume increases to movements with high delays can substantially increase the weighted average delay.

* Indicates unsignalized intersection.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County, "(SM CMP)" indicates CMP intersection in San Mateo County.

[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(Warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.

[c] AM = morning peak hour, PM = evening peak hour.

[d] Cumulative (2035) No Project and Cumulative (2035) With Proposed 2018 General Use Permit presents the results from the Cumulative (2035) Conditions with Four-Lane Page Mill Road from I-280 to Junipero Serra Boulevard Memorandum (see Appendix PMR), which evaluated the effects of the Draft EIR project description on the surrounding transportation network assuming that Page Mill Road remained two lanes in each direction. These results are provided for comparison purposes only.

[e] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.

[f] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software packages, which applies the methods described in the 2000 *Highway Capacity Manual*.

[g] Change ("Δ") in critical volume-to-capacity ratio (V/C) between Cumulative (2035) and Cumulative (2035) With Additional Housing Alternative B Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[h] Change ("Δ") in average critical movement delay between Cumulative (2035) and Cumulative (2035) With Additional Housing Alternative B Conditions. This ratio is not applicable for side-street stop controlled intersections and is denoted by "N/A".

[i] A signal warrant is not met for this intersection.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Generally, at the study intersections located closest to the campus, Additional Housing Alternative B would increase congestion compared to the proposed Project. At the study intersections located farther from the campus, this alternative would reduce congestion by a small degree compared to the proposed Project because peak-hour, peak-direction residence-based trips are assumed to start and end at destinations closer to the Stanford campus as compared to peak-hour, peak-direction commute trips. When compared to the proposed Project, Additional Housing Alternative B would add approximately 110 peak hour trips to intersections directly adjacent to the campus along El Camino Real and between 10 to 60 peak hour trips to intersections that border the campus along Sand Hill Road and Junipero Serra Boulevard. Overall, Additional Housing Alternative B would not reduce significant effects of the proposed 2018 General Use Permit under 2035 conditions.

The intersections where there would be a significant impact under 2035 Cumulative with Additional Housing Alternative B conditions, and the reason that the impact is considered significant, are documented in **Table 7B.15-12**. Additional Housing Alternative B would make a cumulatively considerable contribution that differs from that for the proposed Project in terms of the time period(s) when the impact would occur, as follows:

- At Intersection #33 (Foothill Expressway/Springer Road- Magdalena Avenue) – Additional Housing Alternative B (AM peak hour) versus Proposed Project (AM and PM peak hours)
- Intersection #58 (Alma Street/Charleston Road) – Additional Housing Alternative B (AM and PM peak hours) versus Proposed Project (PM peak hour)
- Intersection #89 (Central Expressway/Castro Street-Moffett Boulevard) – Additional Housing Alternative B (PM peak hour) versus Proposed Project (AM peak hour)

Measures/strategies to mitigate the contribution of Additional Housing Alternative B to significant cumulative impacts are described below.

Mitigation Measure: Implement Mitigation Measure 7B.15-2(a)-(b).

As detailed in Mitigation Measure 7B.15-2a, Stanford shall mitigate the peak hour, peak direction transportation impacts of its additional development and population growth either through a program of "no net new commute trips" or through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts. Further, Mitigation Measure 7B.15-2(b) requires that Stanford mitigate the peak-hour, off-peak (reverse commute) transportation impacts of its additional development and population growth through the contribution of funding equivalent to Stanford's fair share of the cost of improvements for adversely affected intersections, which funds shall be expended by the County to fund transportation mitigation efforts.

Significance after Mitigation: Significant and Unavoidable.

TABLE 7B.15-12
2035 CUMULATIVE WITH PROJECT INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#2 I-280 NB Off-Ramp / Sand Hill Road (AM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#17 Junipero Serra Blvd – Foothill Expressway / Page Mill Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#19 Hanover Street / Page Mill Road (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#20 El Camino Real / Page Mill Road – Oregon Expressway (AM and PM Peak Hours)	**VTA:** During the AM peak hour, project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F. During the PM peak hour, under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#21 Middlefield Road / Oregon Expressway (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#29 Foothill Expressway / Hillview Avenue (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#30 Foothill Expressway / Arastradero Road (AM and PM Peak Hours)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#31 Foothill Expressway / San Antonio Road (PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#32 Foothill Expressway / El Monte Avenue (AM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#33 Foothill Expressway / Springer Road – Magdalena Avenue (AM and PM Peak Hour)	**VTA:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#37 El Camino Real / Encinal Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#38 El Camino Real / Valparaiso Avenue (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.
#41 El Camino Real / Ravenswood Road (PM Peak Hour)	**Menlo Park:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average delay on a critical movement by more than 0.8 seconds.

TABLE 7B.15-12 (CONTINUED)
2035 CUMULATIVE WITH PROJECT INTERSECTION SIGNIFICANT IMPACTS

Intersection	Significance Criteria (Threshold of Significance) Exceeded
#48 El Camino Real / Embarcadero Road (PM Peak Hour)	**VTA:** Project-generated traffic would cause a degradation from an acceptable LOS E to an unacceptable LOS F.
#56 Alma Street / Hamilton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#58 Alma Street / Charleston Road (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#59 Middlefield Road / Marsh Road (AM Peak Hour)	**Atherton:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#63 Middlefield Road / Lytton Avenue (PM Peak Hour)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#66 Middlefield Road / Embarcadero Road (AM and PM Peak Hours)	**Palo Alto:** Under unacceptable LOS E conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#89 Central Expwy / Castro St. – Moffett Blvd. (AM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.
#90 Foothill Expressway / Edith Avenue (PM Peak Hour)	**Santa Clara County:** Under unacceptable LOS F conditions without and with the project, project-generated traffic would increase the average critical delay by more than four seconds and would increase the critical volume-to-capacity ratio by 0.01 or more.

This mitigation would substantially reduce Additional Housing Alternative B's contribution to cumulative traffic congestion impacts to intersections; however, the contribution of Additional Housing Alternative B to the cumulative impact would be a significant and unavoidable impact because there is no feasible mitigation to improve some of the affected intersections, and for others it is uncertain whether it would be feasible to improve the intersections if the No Net New Commute Trips standard is not achieved or if there are not sufficient off-campus projects available to reduce peak hour traffic. As discussed in further detail below, many of the intersections adversely affected under 2035 Cumulative with Additional Housing Alternative B conditions identified in Table 1B in Mitigation Measure 7B.15-2(a) are located in other jurisdictions, and consequently, the improvements depend on the actions of those jurisdictions. In some cases, additional funding for intersection improvements may be required and is not yet identified, and consequently, it is not certain that these improvements would be implemented in a timely manner. At one intersection, the mitigation measure would improve LOS and delay, but would not mitigate impacts to a less-than-significant level. At other intersections, there are no feasible improvements to reduce the impact to a less-than-significant level. For these reasons, the impact would remain significant and unavoidable.

CEQA Guidelines section 15126.4(1)(1)(D) states that if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the proposed Project, the effects of the mitigation measure should be discussed. Because, as discussed below, the identified intersection improvements would have the potential to result in effects on bicycle and/or pedestrian conditions, these effects are discussed below. In all cases, these effects are determined to be less than significant.

- **Intersection #2: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative B conditions, which stipulates contribution of fair-share funding to the addition of a second northbound right-turn lane at the signalized intersection of I-280 Northbound Off-Ramp / Sand Hill Road, as identified in the *ConnectMenlo Final Environmental Impact Report.***

  To accommodate the construction of a second right-turn lane on the northbound off-ramp, the off-ramp would be widened from two to three lanes, which may require the acquisition of additional right-of-way.

  Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement depends on the actions of Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on the eastbound bicycle lane's StreetScore+ QOS, as it would remain unchanged at QOS 4. Right turns from the northbound off-ramp to Sand Hill Road are not permitted during a red light. The addition of a second northbound right-turn lane would not conflict with eastbound bicyclists if the No Right Turn on Red were to remain in-force. Therefore, the mitigation measure would not adversely affect the existing bicycle lane on Sand Hill Road. There are no pedestrian facilities at this intersection.

- **Intersection #17: Contribute fair-share funding to the addition of a third westbound through lane on Page Mill Road and a receiving lane on the west leg of the intersection (resulting in three westbound lanes from Junipero Serra Boulevard to approximately Old Page Mill Road); installation of an overlap signal phase for northbound, southbound, and westbound right-turning vehicles; and widening of southbound Junipero Serra Boulevard to two lanes between Stanford Avenue and Page Mill Road to align with the existing designated right-turn lane.**

  This mitigation differs from the mitigation under the proposed Project. For the proposed Project, the impact at this intersection would be reduced to a less-than-significant level with the following mitigation: Contribute fair share funding toward:

  (1) the addition of a third through lane on Page Mill Road in the westbound direction (for a total of two left-turn lanes, three through lanes, and a right-turn lane plus a bike lane);

  (2) addition of a receiving lane to westbound Page Mill Road (resulting in three lanes from Junipero Serra Boulevard approximately to Old Page Mill Road); and

(3) installation of an overlap phase for northbound and southbound right-turning vehicles and widening of the southbound approach to two lanes between Page Mill Road and Stanford Avenue to align with the existing designated right-turn lane.[85]

For Additional Housing Alternative B, the impact at this intersection cannot be mitigated to a less-than-significant level with the mitigation measures identified for the proposed Project, and the additional mitigation described above (installation of an overlap phase for westbound right-turning vehicles) would be needed.[86] Installation of the overlap phases would be accommodated through the modification of the existing traffic signal, which requires no additional right-of-way. Widening the southbound approach to two lanes between Page Mill Road and Stanford Avenue will likely require the acquisition of additional right-of-way. This improvement would allow southbound right-turning vehicles additional queuing space so southbound through vehicles do not block the right-turn lane. The new westbound improvements would require some right of way (10-12 feet) from the subdivision corner (northeast) and along the dish parcel for the receiving lane (northwest).

Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's impact is mitigated. Therefore, the impact would remain significant and unavoidable.

It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* to widen Page Mill Road from just east of Junipero Serra Boulevard-Foothill Expressway to the I-280 ramps. The Tier 1 improvement is fully funded through Measure B, but conservatively is not anticipated to be in place by 2035. This was evaluated as a potential mitigation measure and was determined not to bring the impact to a less-than-significant level under 2035 Conditions.

***Impacts of Mitigation*:** With the exception of construction-related impacts, the mitigation would not have a substantial adverse effect on bicycle and pedestrian QOS, which would remain at QOS 3.5 and 4.0, respectively.

- **Intersection #19: Contribute fair-share funding to installation of a second westbound left-turn lane, at the signalized intersection of Hanover Street / Page Mill Road, identified as an option in the *Page Mill Expressway Corridor Study Report*.**

  To accommodate the construction of a second westbound left-turn lane, the westbound approach would need to be widened from three to four lanes and may require the removal of the center median, reduction in lane width, and/or reduction in bicycle lane width at

[85] The third improvement was identified as a mitigation measure in the Draft EIR. Two additional improvements have been added to ensure the impact is mitigated to a less-than-significant level under the assumption that Page Mill Road is four lanes, rather than six lanes as previously assumed.

[86] Note that the third westbound through lane and receiving lane on the east leg was added to the mitigation for the proposed project to address the impact at this intersection with the revised assumption that Page Mill Road would remain four lanes between Junipero Serra Boulevard and I-280.

the intersection. There is adequate right-of-way to accommodate the dual westbound left-turn lanes and associated receiving lanes on Hanover Street.

Implementation of this mitigation measure would reduce the impact to a less-than-significant level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to the cumulative impact is reduced to less than considerable. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4 and QOS 3, respectively. With the proposed mitigation, limited bicycle facilities on Hanover Street would remain, as well as the intersection crossing distance, maintaining but not exacerbating the current uncomfortable conditions for bicyclists at the intersection. Pedestrian crossing distances would be unchanged on all approaches. The proposed mitigation measure would not create additional conflicts for the City of Palo Alto's proposed Class I facility on the south side of Page Mill Road as identified in their *Bicycle and Pedestrian Transportation Plan*.

It is noted that there is another Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*. The improvement would convert the signal phasing to an eight-phase signal. That improvement would not reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. Therefore, it was not identified as a mitigation measure. The proposed mitigation measure for Intersection 19 would not conflict with the County's Tier 1 intersection improvement.

- **Intersection #20: Contribute fair-share funding to the reconfiguration of the north leg of the intersection to include a designated southbound right-turn lane with an overlap signal phase; the reconfiguration of the east leg of the intersection to include one right-turn lane, two through lanes, two extended left-turn lanes, two receiving lanes, and no on-street parking; and to the extension of the double left-turn lanes, at the signalized intersection of El Camino Real / Page Mill Road – Oregon Expressway, as identified in the *Page Mill Expressway Corridor Study Report*. In addition, a designated southbound right-turn lane with an overlap signal phase would be installed.**

  This is the same mitigation measure identified for the proposed Project, except that the addition of a designated southbound right-turn lane with an overlap signal phase would be required under Additional Housing Alternative B to mitigate the significant impact to a less-than-significant level.

  To accommodate the reconfiguration of the east leg of the intersection, parking would need to be removed along the south side of Page Mill Road, and the median island would need to be shifted to the south to accommodate the additional westbound lane. Little to no right-of-way would be needed to accommodate this improvement; however, an easement would be needed on the north side of the roadway to preserve the sidewalk width, and the bus stop on the southeast corner of the intersection on Oregon Expressway may need to be relocated or further addressed during design. To accommodate the southbound right-turn lane, parking would need to be removed and the eastbound U-turn movement would need to be restricted. This would limit the access to some of the parcels along Page Mill Road. These

improvements are identified in Santa Clara County's *Page Mill Corridor Expressway Plan*, and the extension of the double westbound left-turn lanes is identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040* along with enhanced pedestrian facilities on the southwest and southeast corners of the intersection.

Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. However, because this improvement depends on the actions of Caltrans, and the provision of the remaining improvements may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 4. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions assuming the parking is removed next to the eastbound receiving lanes, and right-turn slip lanes and/or high vehicle turning speeds would remain, maintaining the current uncomfortable conditions for bicyclists and pedestrians at the intersection. The proposed mitigation measure would not conflict with the City of Palo Alto's *Bicycle and Pedestrian Transportation Plan* to implement a Class III facility on Oregon Expressway east of the intersection.

- **Intersection #30: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative B conditions, which stipulates contribution of fair-share funding to a grade-separation improvement project, at the signalized intersection of Foothill Expressway / Arastradero Road, as identified in the draft *Santa Clara County Expressway Plan 2040* (if such project is approved and implemented). The grade separation assumes inclusion of a separated through-way for vehicles on Foothill Expressway.**

  Although the configuration of this proposed interchange has yet to be determined, additional right-of- way would be required to construction this improvement. Due to the proximity of the Miranda Avenue / Arastradero Road intersection, additional modifications to roadway alignment and turning movements would need to be evaluated along with adequate access for bicyclists and pedestrians.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. However, because this improvement has not undergone CEQA review, may not be approved, and would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, which would remain unchanged at QOS 3.5. Right-turn lanes and high vehicle speeds would continue to cause uncomfortable situations for bicyclists at the intersection. However, the mitigation would improve pedestrian QOS from QOS 4 to QOS 2.5. With the proposed mitigation, the pedestrian crossing distances at the northbound

and southbound approaches would be reduced from the existing 6+ lanes to an estimated 3 lanes, providing more comfortable pedestrian crossing conditions at the intersection.

- **Intersection #31: Contribute fair-share funding to the addition of a third southbound through lane on Foothill Expressway between San Antonio Road and El Monte Avenue.**

  A third receiving lane would be added on the south leg of Foothill Expressway, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040*, to extend the southbound right-turn lane from El Monte Avenue to San Antonio Road, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle StreetScore+ QOS, as it would remain unchanged at QOS 4. With the proposed mitigation, right-turn slip lanes and high vehicle turning speeds would remain, maintaining the current uncomfortable environments for bicyclists at the intersection. The proposed mitigation measure would have no effect on pedestrian quality of service as there is no pedestrian access at this intersection.

  It is noted that the full Tier 1 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #31 would implement the southbound widening.

- **Intersection #32: Contribute to fair-share funding to the addition of a third northbound through lane, and an associated receiving lane at the signalized intersection of Foothill Expressway / El Monte Avenue, as identified in the draft *Santa Clara County Expressway Plan 2040.***

  To accommodate the construction of a third northbound through lane, the northbound approach would be widened from two to three lanes and may require the acquisition of additional right-of-way. The receiving lanes on the north side of the intersection would also need to be widened, as identified as a Tier 1 improvement in the draft *Santa Clara County Expressway Plan 2040,* to extend the northbound right-turn lane from San Antonio Road to El Monte Avenue, which likely would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. The Tier 1 improvements are fully funded through Measure B. Because the remainder of these improvements would require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged, at QOS 4 (for both). The east-west bicycle and pedestrian crossing distances would increase slightly due to the additional through lane and continue to have right-turn slip lanes and high vehicle turning speeds, while maintaining the current QOS score.

It is noted that the full Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes widening Foothill Expressway from four to six lanes between San Antonio Road and El Monte Avenue. The mitigation measure identified above for Intersection #32 would implement the northbound widening, but while southbound widening would increase the available storage capacity, it would not be enough to reduce Additional Housing Alternative B's AM peak-hour impact to a less-than-significant level. Therefore, the southbound widening was not identified as a potential mitigation measure at this intersection.

- **Intersection #33: Contribute fair-share funding to the following improvements, at the signalized intersection of Foothill Expressway / Springer Road – Magdalena Avenue, as identified as a Tier 2 improvement in the draft Santa Clara County *Expressway Plan 2040*:**

  – Convert the signal to provide 8-phase phasing;

  – Change the lane configuration for the east leg to have two left-turn lanes, one through lane, and one right-turn lane; and

  – Change the lane configuration for the west leg to have one left-turn lane, two through lanes, and one right-turn lane.

  To accommodate an eight-phase signal, the eastbound and westbound left-turn movements would require designated left-turn lanes, and may require the acquisition of additional right-of-way. To accommodate the change to eastbound and westbound lane configurations, the center median on the west leg of the intersection would need to be shifted to incorporate a designated left-turn lane and remove one receiving lane from the west leg. The eastbound approach would require restriping to change the shared left-turn/through lane to a designated left-turn lane.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. However, because this improvement may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. To construct the designated eastbound left-turn lane, the eastbound lanes will be narrowed and the center median may be reduced, resulting in the same curb-to-curb width, but increasing the number of travel lanes. The proposed mitigation would not adversely affect the City of Los Alto's existing Class II bicycle facilities at the intersection.

It is noted that the full Tier 2 intersection improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040* includes converting to an eight-phase signal, operational/safety improvements at the County Club Drive intersection, and potentially adding a signal at the adjacent Berry Avenue intersection. The mitigation measure identified above for Intersection #33 would implement the eight-phase signal and associated lane configuration changes at the intersection.

- **Intersection #37: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Encinal Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to the significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.8 and QOS 2.7, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances on all approaches. While the bicycle StreetScore+ QOS on the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a dedicated right-turn lane. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) proposes Class II bike lanes on El Camino Real between Valparaiso Avenue and Alejandra Avenue, and the City of Menlo Park *El Camino Corridor Study* (approved May 2016) proposes buffered Class II bike facilities (bicycle lanes) on El Camino Real between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At Encinal Avenue, the northbound right-turn lane would allow for the conversion of a through/ right-turn lane while maintaining the City's goal to provide bicycle lanes up to the Encinal Avenue intersection. The proposed mitigation measure could conflict with a Class II bicycle lane if only on-street parking is removed in order to add a third through lane. However, if the center median were narrowed, space for a bicycle lane could be provided. The existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers if the proposed mitigation measure is constructed. However, this is typical for bus stops on El Camino Real and other major arterials.

- **Intersection #38: Contribute fair-share funding to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Valparaiso Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable

level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 4, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. While the bicycle StreetScore+ QOS on the northbound approach would not improve, bicyclists would no longer move left across the right-turn conflict area, and instances of Right Turn On Red would be reduced because vehicles would no longer have a dedicated right-turn lane. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) proposes Class II bike lanes on El Camino Real between Valparaiso Avenue and Alejandra Avenue, and the City of Menlo Park *El Camino Corridor Study* (approved May 2016) proposes buffered Class II bike facilities (bicycle lanes) on El Camino Real between Encinal Avenue and Middle Avenue as part of the preferred alternative (Alternative 2). At Encinal Avenue, the northbound right-turn lane would allow for the conversion of a through/ right-turn lane while maintaining the City's goal to provide bicycle lanes up to the Encinal Avenue intersection. The proposed mitigation measure could conflict with a Class II bicycle lane if only on-street parking is removed in order to add a third through lane. However, if the center median were narrowed, space for a bicycle lane could be provided. The existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers if the proposed mitigation measure is constructed. However, this is typical for bus stops on El Camino Real and other major arterials

- **Intersection #41: Contribute fair-share funding reconfiguration of the eastbound approach on Menlo Avenue to include an exclusive left-turn lane, and to the conversion of the northbound right-turn lane to a shared through/right-turn lane, at the signalized intersection of El Camino Real / Ravenswood Road.**

  This is the same mitigation measure identified for the proposed Project, except that the addition of an exclusive eastbound left-turn lane would be required under Additional Housing Alternative B to mitigate the significant impact to a less-than-significant level.

  To accommodate the northbound lane reconfiguration within the existing right-of-way, on-street parking would be removed on the east side of El Camino Real; the widening of Menlo Avenue would require additional right-of-way.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.5 (for both). The proposed mitigation would not alter the existing pedestrian crossing distances, except on the west leg of the intersection, across which pedestrians would

experience an additional 10-12 feet of exposure while in the intersection. The San Mateo *County Comprehensive Bicycle and Pedestrian Plan* (2011) and the City of Menlo Park *Comprehensive Bicycle Development Plan* (2005) propose Class III bike routes on El Camino Real at Valparaiso Avenue. The proposed mitigation measure would not conflict with a Class III bikeway.

- **Intersection #48: Contribute fair-share funding to the addition of a second northbound left-turn lane, at the signalized intersection of El Camino Real / Embarcadero Road.**

  To accommodate the construction of a second northbound left-turn lane, the northbound approach would be widened from four to five lanes by potentially reducing the lane widths, reducing the width of the center median, and/or removing on-street parking for the length of the additional left-turn pocket and taper. Addition right-of-way may be required to accommodate the second northbound left-turn lane.

  Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto and Caltrans, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.8 and QOS 4, respectively. With the proposed mitigation, bicycle and pedestrian crossing distances would remain unchanged in all directions, but would add an additional travel lane on the south leg of the intersection, with right-turn slip lanes and high vehicle turning speeds maintaining the current uncomfortable environment at the intersection. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*. It should be noted that the City of Palo Alto is currently designing bicycle improvements at this intersection.

  The VTA El Camino Real Bus Rapid Transit (BRT) Project would upgrade Rapid Bus Route 522 to have BRT status. The geometric alternatives included in the draft Environmental Impact Report for the BRT Project do not include a separate bus lane through this intersection. Some alternatives studied include the creation of outboard bus lanes through the removal of parking on the south side of El Camino Real. Because there is no final design for this intersection, and the BRT project completion date is uncertain, it is not possible to determine what, if any, effect this mitigation measure would have on the BRT Project. However, the existing bus stop on the northeast corner on El Camino Real may block through traffic when boarding and alighting passengers; this typical for bus stops on El Camino Real and other major arterials.

- **Intersection #56: Contribute fair-share funding to the reconfiguration of the westbound approach to have one left-turn lane and one right-turn lane, at the signalized intersection of Alma Street / Hamilton Avenue.**

  To accommodate the lane reconfiguration within the existing right-of-way, on-street parking would be removed on the north side of Hamilton Avenue.

Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Palo Alto, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 2.5 and QOS 2, respectively. The proposed mitigation would not alter the existing pedestrian crossing distances. This proposed mitigation would not adversely affect the City of Palo Alto's proposed Class III bike routes as identified in their *Bicycle and Pedestrian Transportation Plan*.

- **Intersection #58: Implement the same mitigation identified for this intersection under 2018 Baseline with Additional Housing Alternative B conditions, which stipulates contribution of fair-share funding to the addition of a designated northbound right-turn lane and installation of an overlap phase for the northbound and southbound right-turn movements at the signalized intersection of Alma Street / Charleston Road.**

  To accommodate the construction of a designated northbound right-turn lane, the northbound Alma Street approach would need to be widened and likely would require the acquisition of additional right-of-way. Installation of an overlap phase for northbound and southbound right-turning vehicles would be accommodated through the modification of the existing traffic signal.

  Implementation of this mitigation measure would improve the level of service, and the impact would be reduced, but not to a less-than-significant level. Therefore, the contribution of Additional Housing Alternative B to this impact would remain considerable, and the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The mitigation would not have a substantial adverse effect on bicycle and pedestrian StreetScore+ QOS, as they would remain unchanged at QOS 3.3 and QOS 3.5, respectively. With the proposed mitigation, pedestrian crossing distances would increase slightly on the south leg of the intersection, and remain unchanged on all other approaches, while maintaining the current QOS score at the intersection. Bicycle lanes on the eastbound and westbound approaches, and low right-turn speeds would remain, resulting in slightly better conditions compared to what bicyclists experience on the northbound and southbound approaches. The proposed mitigation measure for Intersection #58 would not conflict with the City of Palo Alto's proposed Class III bike route along Alma Street as identified in the City of Palo Alto Bicycle & Pedestrian Transportation Plan.

- **Intersection #59: Contribute fair-share funding to the addition of a second westbound left-turn lane and a second receiving lane on the south leg, at the signalized intersection of Middlefield Road / Marsh Road.**

  The construction of a second westbound left-turn lane and a second receiving lane would require the acquisition of additional right-of-way. This mitigation measure is consistent with recommendations in the *ConnectMenlo Final EIR,* the *Middle Plaza at 500 El Camino Real Draft EIR*, the *Menlo Park Facebook Campus Expansion Project FEIR* and the *Menlo*

Gateway Final EIR. The Town of Atherton has preliminary plans to redesign the intersection.

Implementation of this mitigation measure would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level. However, because this improvement depends on the actions of the City of Menlo Park and Town of Atherton, and may require additional funding that has not yet been identified, it is not certain that this improvement would be implemented in a timely manner such that the contribution of Additional Housing Alternative B to this significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

***Impacts of Mitigation*:** The proposed mitigation would cause the bicycle StreetScore+ QOS to worsen from QOS 2.7 to QOS 3; the pedestrian StreetScore+ QOS would remain unchanged at QOS 3. With the proposed mitigation, a second receiving lane would be added on the southbound approach, causing an uncomfortable situation where bicyclists travel along a four-lane roadway compared to a three-lane roadway existing today. Missing sidewalks and curb ramps cause uncomfortable situations for pedestrians at all intersection crossings.

- **Intersection #89: Close Castro Street at the train tracks to form a T-intersection of Central Expressway / Moffett Boulevard, consistent with recommendations in the May 2017 *Mountain View Transit Center Master Plan*.**

  The City of Mountain View has approved plans to close Castro Street (the west leg) at the train tracks, which would change the current four-leg intersection to a T-intersection of Central Expressway and Moffett Boulevard. This improvement would not require any additional right-of-way if implemented by the City of Mountain View. Given that this is the City's preferred improvement and would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less-than-considerable level, the closure of Castro Street is the identified mitigation measure at this intersection; if Castro Street is independently closed by the City of Mountain View, Stanford would not need to contribute funding to any improvements at this intersection.

  It is noted that there is a Tier 1 improvement identified for this intersection in the draft *Santa Clara County Expressway Plan 2040*, which would grade-separate the train tracks from the intersection, increasing the available capacity at the intersection and reducing Additional Housing Alternative B's impact to a less-than-significant level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that Additional Housing Alternative B's contribution to the significant cumulative impact is mitigated. Therefore, the impact would remain significant and unavoidable.

  ***Impacts of Mitigation*:** The proposed mitigation is anticipated to improve bicycle and pedestrian QOS; the bicycle QOS would shift from 3.3 to 1.7, and the pedestrian QOS would shift from 4 to 2. With the closure of Castro Street, pedestrian and bicycle crossings will be moved to a separated underground facility to cross Central Expressway and the Caltrain tracks with the exception of the east leg of the intersection where pedestrian crossings would still occur at-grade. Northbound and southbound bicyclists would continue to travel on Central Expressway, but bicyclists traveling from Moffett Boulevard to Castro Street would use the underground crossing.

***Intersection #89 Alternative Mitigation*:** If the closure of Castro Street is not implemented in a timely manner and/or the City of Mountain View does not pursue the improvement, the following alternative (back-up) mitigation measure is proposed, which would reduce the contribution of Additional Housing Alternative B to this significant cumulative impact to a less than considerable level:

> *Intersection #89 Alternative Mitigation Measure*: Contribute fair-share funding to the construction of a second southbound left-turn lane from Central Expressway to Moffett Boulevard.

To accommodate the construction of a second southbound left-turn lane, the Central Expressway center median would need to be reduced and/or removed; the improvement would not require any additional right-of-way. Given the existing and proposed geometry, signal timings may also need to be modified to provide lead-lag left turns (to account for potential truck turn conflicts). With this mitigation, the contribution of Additional Housing Alternative B to the significant cumulative impact would be reduced to a less-than-considerable level. However, because this improvement depends on the actions of the City of Mountain View, it is not certain that this improvement would be implemented in a timely manner such that the contribution of the proposed Project to the significant cumulative impact is mitigated. In that case, the impact would remain significant and unavoidable.

Remaining Intersections: Due to physical constraints, no feasible mitigation measures have been identified at the following intersections, and the contribution of Additional Housing Alternative B to significant cumulative impacts would remain considerable, and the cumulative impacts would remain significant and unavoidable:

22. Middlefield Road / Oregon Expressway – the constraint is the proximity of the Oregon Avenue frontage road and the County's desire to preserve the shoulder striping along Oregon Expressway for use by bicyclists.

30. Foothill Expressway / Hillview Avenue – the constraint is the proximity of the Miranda Avenue / Hillview Avenue intersection and lack of improvement identified in the draft Santa Clara County Expressway Plan 2040.

64. Middlefield Road / Lytton Avenue – the constraint is the proximity of the residential units near the intersection.

67. Middlefield Road / Embarcadero Road – the constraint is the proximity of the residential units near the intersection.

91. Foothill Expressway / Edith Avenue – the constraint is the proximity of the residential units and retail space near the intersection.

See **Table 7B.15-13** for mitigated LOS conditions.

TABLE 7B.15-13
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Additional Housing Alt. B		Mitigation Measure	2035 Cumulative With Additional Housing Alt. B (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
2	I-280 NB Off-Ramp / Sand Hill Rd	Menlo Park	LOS D	AM PM	**136.9** 18.4	**F** B-	**155.1** 19.0	**F** B-	See MM 7B.15-2(a) (Table 2B)	**67.3** 16.0	**E** B	LTS/SU
17	Junipero Serra Blvd – Foothill Expy / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**180.4** **162.9**	**F** **F**	**191.0** **176.4**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	**150.5** **162.4**	**F** **F**	LTS/SU
19	Hanover Street / Page Mill Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**85.6** 51.9	**F** D-	**94.3** 60.1	**F** E	See MM 7B.15-2(a) (Table 2B)	74.5 57.9	E- E+	LTS/SU
20	El Camino Real / Page Mill Road – Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	75.1 **83.1**	E- **F**	**88.1** **94.1**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	67.3 **81.1**	E **F**	SU
21	Middlefield Road / Oregon Expressway	Santa Clara Co. (SC CMP)	LOS E	AM PM	**122.7** **101.5**	**F** **F**	**125.5** **103.5**	**F** **F**	*N/A (no feasible improvements)*			SU
29	Foothill Expressway / Hillview Avenue	Santa Clara County	LOS E	AM PM	**124.6** 58.3	**F** E+	**133.5** 63.7	**F** E	*N/A (no feasible improvements)*			SU
30	Foothill Expressway / Arastradero Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	**194.5** **202.5**	**F** **F**	**200.8** **208.4**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	41.9 70.7	D E	LTS/SU
31	Foothill Expressway / San Antonio Road	Santa Clara Co. (SC CMP)	LOS E	AM PM	38.8 **165.8**	D+ **F**	42.7 **170.4**	D **F**	See MM 7B.15-2(a) (Table 2B)	42.7 46.4	D D	LTS/SU
32	Foothill Expressway / El Monte Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**142.6** **133.5**	**F** **F**	**148.5** **137.4**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	74.6 **113.5**	E **F**	LTS/SU
33	Foothill Expressway / Springer Road – Magdalena Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	**128.7** **151.5**	**F** **F**	**131.8** **154.5**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	**122.7** **147.7**	**F** **F**	LTS/SU
37	El Camino Real / Encinal Ave	Menlo Park	LOS D	AM PM	44.9 **89.9**	D **F**	45.6 **92.7**	D **F**	See MM 7B.15-2(a) (Table 2B)	35.6 **67.1**	D+ **E**	LTS/SU
38	El Camino Real / Valparaiso Ave	Menlo Park	LOS D	AM PM	53.5 **56.0**	D- **E+**	54.0 **57.3**	D- **E+**	See MM 7B.15-2(a) (Table 2B)	52.5 52.3	D- D-	LTS/SU

TABLE 7B~~5~~.15-13 (CONTINUED)
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE B INTERSECTION LEVELS OF SERVICE
(*MITIGATED CONDITIONS*)

ID	Intersection	Jurisdiction/ CMP[a]	LOS Threshold[b]	Peak Hour[c]	2035 Cumulative		2035 Cumulative With Additional Housing Alt. B		Mitigation Measure	2035 Cumulative With Additional Housing Alt. B (Mitigated)		Impact Significance with Mitigation[f]
					Delay[d]	LOS[e]	Delay[d]	LOS[e]		Delay[d]	LOS[e]	
41	El Camino Real / Ravenswood Road	Menlo Park	LOS D	AM PM	48.0 **63.8**	D **E**	48.8 **66.1**	D **E**	See MM 7B.15-2(a) (Table 2B)	46.6 **59.5**	D **E+**	LTS/SU
48	El Camino Real / Embarcadero Road	Palo Alto (SC CMP)	LOS E	AM PM	56.9 72.1	E+ E	62.1 **86.2**	E **F**	See MM 7B.15-2(a) (Table 2B)	53.7 74.9	D- E	LTS/SU
56	Alma Street / Hamilton Avenue	Palo Alto	LOS D	AM PM	10.2 **57.7**	B+ **E+**	10.5 **62.0**	B+ **E**	See MM 7B.15-2(a) (Table 2B)	10.1 40.3	B+ D	LTS/SU
58	Alma Street / Charleston Road	Palo Alto	LOS D	AM PM	123.4 121.5	**F** **F**	**128.3** **127.6**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	121.5 **124.0**	F **F**	SU
59	Middlefield Road / Marsh Road	Atherton	LOS D	AM PM	**76.9** **76.0**	**E-** **E-**	**79.8** **77.5**	**E-** E-	See MM 7B.15-2(a) (Table 2B)	41.9 **68.6**	D **E**	LTS/SU
63	Middlefield Road / Lytton Avenue	Palo Alto	LOS D	AM PM	49.2 **66.1**	D **E**	51.1 **70.4**	D- **E**	N/A (no feasible improvements)			SU
66	Middlefield Road / Embarcadero Road	Palo Alto	LOS D	AM PM	55.0 **68.1**	D- **E**	**59.2** **73.1**	**E+** **F**	N/A (no feasible improvements)			SU
89	Central Expwy / Castro St-Moffett Blvd	Santa Clara Co. (SC CMP)	LOS E	AM PM	**240.1** **222.1**	**F** **F**	**243.9** **225.8**	**F** **F**	See MM 7B.15-2(a) (Table 2B)	**97.0** **132.7**	**F** **F**	LTS/SU
90	Foothill Expressway / Edith Avenue	Santa Clara Co. (SC CMP)	LOS E	AM PM	55.9 **105.5**	E+ **F**	60.8 **118.8**	E **F**	N/A (no feasible improvements)			SU

Bold text indicates intersection operates at unacceptable level of service. **Bold and Shaded text** indicates a significant impact.

[a] Intersection jurisdiction and identification of CMP (Congestion Management Program) intersections. "(SC CMP)" indicates CMP intersection in Santa Clara County.
[b] LOS Threshold is the threshold between acceptable and unacceptable level of service. "(warrant)" indicates that meeting Signal Warrant 3 (Peak Hour Volumes) is part of the threshold of a significant impact.
[c] AM = morning peak traffic hour, PM = evening peak traffic hour.
[d] Whole intersection weighted average control delay (signalized and all-way stop-controlled intersections) expressed in seconds per vehicle calculated using methods described in the 2000 *Highway Capacity Manual*, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. For side-street stop-controlled intersections, delay and LOS are reported for the worst-case approach.
[e] LOS = Level of Service. LOS calculations conducted using the TRAFFIX 8.0 analysis software program, which applies the methods described in the 2000 *Highway Capacity Manual*.
[f] LTS/SU = less-than-significant with mitigation, but is either (1) located outside Santa Clara County where mitigation measures depend on funding and actions by other jurisdictions, or (2) located in Santa Clara County, but depends on other funding for the mitigation to be constructed, and thus the mitigation measure may not be implemented in a timely manner to avoid the impact. Significance determination is based on draft mitigation and responsible jurisdiction of the intersection;
SU = significant and unavoidable.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

Impact 7B.15-10: Implementation of Additional Housing Alternative B, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Additional Housing Alternative B conditions. (*Significant)*

Please note that only the freeway mainline segment impact analysis is provided for the Additional Housing Alternative B analysis. As described on Draft EIR page 5.15-58, freeway ramp queueing is not considered an environmental impact, but rather an operational consideration that is managed over time by Caltrans and local jurisdictions.

As described above, the results for the Cumulative (2035) No Project and 2035 Cumulative With Proposed Project conditions have been updated since publication of the Draft EIR to correct the assumed lane configuration on Page Mill Road under cumulative conditions. Modeling conducted for the Draft EIR assumed Page Mill Road would have six travel lanes based on VTA's 2040 traffic model. Subsequently, VTA staff indicated that inclusion of the 6-lane configuration had been an error on the part of VTA. The updated results are based on modeling that assumes no change to the existing 4-lane configuration for Page Mill Road.

The future operations of freeway mainline segments in Santa Clara County and San Mateo County are evaluated using volume-to-capacity ratios, with a V/C ratio greater than 1.00 indicating the volume/demand exceeds capacity. Under Cumulative (2035) With Additional Housing Alternative B Conditions, the following 13 freeway segments would meet the significance criteria, which is same as the number under Cumulative (2035) with Project Conditions[87]:

- Northbound SR 85
  - South De Anza Boulevard to Stevens Creek Boulevard (AM peak hour);
  - Stevens Creek Boulevard to I-280 (AM peak hour);
- Southbound SR 85
  - Stevens Creek Boulevard to South De Anza Boulevard (PM peak hour);
  - De Anza Boulevard to Saratoga Avenue (PM peak hour);
- Northbound I- 280
  - Wolfe Road to De Anza Boulevard (AM peak hour);
  - SR 85 to Foothill Expressway (AM and PM peak hours);
  - Foothill Expressway to Magdalena Avenue (AM peak hour);
  - Sand Hill Road to Woodside Road (PM peak hour);
- Southbound I-280
  - Woodside Road to Sand Hill Road (AM peak hour);

[87] Compared to the proposed Project, Additional Housing Alternative B would add one new freeway segment that would meet the significance criteria, but one freeway segment (Southbound I-280 from Sheep Camp Trail to Edgewood Road) that would meet that criteria under the proposed Project would not meet the criteria under Additional Housing Alternative B due to the reduction in commute trips travelling toward campus in the morning.

- Magdalena Avenue to Foothill Expressway (PM peak hour);
- Foothill Expressway to SR 85 (AM and PM peak hours);
- SR 85 to De Anza Boulevard (PM peak hour);
- De Anza Boulevard to Wolfe Road (PM peak hour)

In addition, Additional Housing Alternative B would extend significant impacts on one freeway segment to both the AM and PM peak hours, whereas the proposed 2018 General Use Permit would result in a significant impact to that freeway segment during only the PM peak hour. Overall, Additional Housing Alternative B would not reduce the significant impacts of the proposed 2018 General Use Permit.

The revised assumption that Page Mill Road remains four lanes between I-280 and Junipero Serra Boulevard - Foothill Road in 2035 results in two additional freeway segments meeting the impact criteria under the proposed Project (the 2018 General Use Permit) compared to the number of freeway segments meeting this criteria in the Draft EIR. The two additional freeway segments would be on I-280 southbound (Woodside Road to Sand Hill Road [AM Peak Hour], and SR 85 to De Anza Boulevard [PM Peak Hour]). The Draft EIR concludes that impacts to freeway segments would be significant and unavoidable under Cumulative (2035) with Project conditions. The addition of two more freeway segments to the list presented in the Draft EIR does not change the Draft EIR's conclusions.

There are limited options to widen freeway segments that meet the significance criteria due to right-of-way constraints. Mitigation of freeway impacts is considered beyond the scope of an individual development project, due to the inability of any individual project or local agency to (1) acquire right-of-way for freeway widening, and (2) fully fund a major freeway mainline improvement. Mitigation Measure 7B.15-2(a) would reduce impacts to freeways to the extent that trips to and from the campus are reduced to achieve the No Net New Commute Trips standard and through applying any fair share fees paid by Stanford from exceeding the No Net New Commute Trips standard to alternative programs that reduce vehicular trips. Nevertheless, because it is uncertain whether the No Net New Commute Trips standard would be achieved, the freeway impacts under Additional Housing Alternative B would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable.

Impact 7B.15-11: Implementation of Additional Housing Alternative B, in combination with other past, present, and reasonably foreseeable future, projects, would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities. (*Less than Significant*)

Generally, a project causes a significant impact to transit facilities and services if an element of it would conflict with existing or planned transit services, or would decrease the performance or safety of such services. Similar to the proposed 2018 General Use Permit, Additional Housing Alternative B does not propose infrastructure changes outside the Project site and, thus, would not

interfere with the ability of transit agencies to modify or expand service. Therefore, Additional Housing Alternative B's impact on transit services would be less than significant. Additional Housing Alternative B would add traffic along major transit corridors throughout the cities of Palo Alto and Menlo Park, which could affect operations of bus routes serving the area. However, as shown in **Table 7B.15-14**, Additional Housing Alternative B would not add substantial delays relative to the total route travel time to any of the transit routes assessed, although certain delays are higher under this alternative than under the proposed Project. The additional delay would be fewer than 30 seconds on all but six of the routes and increase travel times by fewer than 60 seconds on all of the routes. For both peak hours, this delay constitutes less than three percent of the total travel time on that route.

Mitigation: None required.

Vehicle Miles Traveled Impacts

California has enacted a law (SB 743) that will phase out the traditional Transportation Impact Assessment as the approach used in documents prepared to comply with CEQA, and replace that methodology with an analysis of Vehicle Miles Traveled. A VMT Analysis evaluates vehicle trips made throughout the day, and focuses on the number and length of vehicle trips made by project employees and residents. Measures to reduce VMT include locating a project near major transit stops and high-quality transit corridors, improving bicycle and pedestrian facilities, and instituting programs to encourage travel by modes other than driving alone. Rather than increasing road capacity, a VMT analysis focuses on getting people out of their cars.

As was shown to be the case for the proposed Project (presented in the Draft EIR), the areas of the Stanford campus where development could occur under Additional Housing Alternative B are within 1/2 mile of an existing major transit stop or an existing stop along a high quality transit corridor. The revised draft CEQA Guidelines circulated by OPR in November 2017 continue to state that generally, projects located on sites within 1/2 mile of an existing major transit stop or an existing stop along a high quality transit corridor should be presumed to have a less-than-significant transportation impact. Nevertheless, a quantitative assessment of VMT generated by Additional Housing Alternative B is provided, similar to that provided for the proposed Project.

The County has not adopted a threshold or established a standard methodology for evaluating VMT. Like the proposed Project, Additional Housing Alternative B represents a unique and distinct set of circumstances compared to other development applications presented to the County and located in predominately rural unincorporated areas of the County because the proposed development that would occur on Stanford lands is predominantly in-fill in nature, inclusive of mixed uses (housing and academic space), and would be located near transit systems. Therefore, the approach used in the following impact discussion would not be applicable to a VMT evaluation of other development applications under consideration by the County.

TABLE 7B.15-14
2035 CUMULATIVE WITH ADDITIONAL HOUSING ALTERNATIVE B TRANSIT ROUTE DELAYS[a]

Route		Direction	Peak Hour	Additional Route Average Delay (seconds)[b]	
				Proposed Project[c]	Additional Housing Alternative B
22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	Eastbound	AM PM	12.2 35.8	16.3 48.8
		Westbound	AM PM	20.9 17.4	11.9 25.5
35	Downtown Mountain View to Stanford Shopping Center	Northbound	AM PM	11.8 22.0	14.2 24.7
		Southbound	AM PM	16.7 13.2	14.3 16.7
89	California Avenue Caltrain Station to Palo Alto Veterans Hospital	Northbound	AM PM	< 5.0 < 5.0	< 5.0 13.7
		Southbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
102	South San Jose to Palo Alto	Northbound	AM	< 5.0	< 5.0
		Southbound	PM	16.7	37.2
104	Penitencia Creek Transit Center to Palo Alto	Eastbound	PM	< 5.0	53.7
		Westbound	AM	26.3	52.2
522	Palo Alto Transit Center to Eastridge Transit Center	Eastbound	AM PM	9.1 34.1	11.7 46.0
		Westbound	AM PM	20.9 17.4	11.9 25.5
281	Onetta Harris Center to Stanford Shopping Center	Eastbound	AM PM	6.5 9.6	9.6 13.5
		Westbound	AM PM	< 5.0 < 5.0	< 5.0 < 5.0
ECR	Daly City BART to Palo Alto Transit Center	Northbound	AM PM	< 5.0 10.0	< 5.0 9.8
		Southbound	AM PM	< 5.0 < 5.0	< 5.0 7.4
DB	Dumbarton Express - Union City BART to Stanford Oval	Eastbound	AM PM	< 5.0 7.4	< 5.0 10.2
		Westbound	AM PM	22.6 9.2	25.7 11.9
DB1	Dumbarton Express 1 - Union City BART to Stanford Research Park	Eastbound	AM PM	< 5.0 8.6	< 5.0 59.2
		Westbound	AM PM	31.1 26.2	56.6 43.6
U	Fremont BART to Stanford Oval	Eastbound	PM	29.4	40.6
		Westbound	AM	17.0	16.8
E	University Avenue Caltrain Station to Baylands Business Parks	Eastbound	AM PM	5.9 14.2	9.6 17.3
		Westbound	AM PM	11.8 < 5.0	6.3 < 5.0
C	University Avenue/Downtown to South Palo Alto at Charleston Road	Eastbound	AM PM	< 5.0 8.9	< 5.0 8.9
		Westbound	AM PM	29.1 6.3	29.3 8.0

[a] Transit route delay is calculated by summing each transit route movements through the study intersections. Some movements may experience large increases or decreases in delay as a result of the analysis software (Traffix 8.0) redistributing green time for each phase.

[b] Additional Housing Alternative B was not considered to have a measurable change in overall transit route delay if the increase in travel time was less than five seconds or the travel time improved slightly (due to changes in signal timing, critical movement changes, etc.).

[c] Cumulative (2035) With Proposed 2018 General Use Permit presents the results from the Cumulative (2035) Conditions with Four-Lane Page Mill Road from I-280 to Junipero Serra Boulevard Memorandum (see Appendix PMR), which evaluated the effects of the proposed Project on the surrounding transportation network assuming that Page Mill Road remained two lanes in each direction. These results are provided for comparison purposes only.

SOURCE: Fehr & Peers, April 2018 (see Appendix ALT-TIA)

The following discussion evaluates the VMT characteristics of Additional Housing Alternative B and is based on the information from the Vehicle Miles Traveled (VMT) Analysis. The evaluation reflects the stated intent of SB 743 and is informed by the draft proposals developed by the State Office of Planning and Research (OPR) for performing SB 743 assessments in CEQA documents.

Significance Criteria

In November 2017, OPR published proposed amendments to the CEQA Guidelines to address the analysis of impacts to transportation.[88] OPR proposes the following criteria for analyzing transportation impacts of land use projects:

Proposed New Section 15064.3. Determining the Significance of Transportation Impacts.

> *(a) Purpose.*
>
> *This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding highway capacity), a project's effect on automobile delay does not constitute a significant environmental impact.*
>
> *(b) Criteria for Analyzing Transportation Impacts.*
>
> *(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.*

Other than the two presumptions listed in proposed CEQA Guidelines section 15064.3(b)(1), OPR does not propose to establish numeric significance criteria through the CEQA Guidelines. OPR's Technical Advisory provides numeric thresholds that an agency could choose to use when assessing the significance of a project's additional vehicle miles traveled in the event that the presumptions in proposed CEQA Guidelines section 15064.3(b)(1) do not apply.

Based on OPR's *Proposed Updates to the CEQA Guidelines* (November 2017) and OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (April 2018), the following significance criteria were used to assess VMT Additional Housing Alternative B:

1. Is the project within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor? If so, the project is presumed to result in a less-than-significant impact on VMT.

[88] See http://opr.ca.gov/docs/20171127_Text_of_15064-3.pdf.

2. Alternatively, the proposed Project is considered to result in a significant impact to VMT if project-related VMT would exceed the following numeric thresholds:

    - Residential Per Capita Daily VMT: A project exceeding existing regional household daily VMT per capita minus 15 percent.[89]

    - Worker Per Capita Daily VMT: A project exceeding a level of 15 percent below existing regional daily VMT per worker.

Approach to Analysis

OPR's *Technical Advisory* suggests that lead agencies can evaluate each component of a mixed-use project independently, and apply the significance threshold for each project type included in the mixed-use project. The analysis of each use may reflect credit for internal capture of trips within the project. Based on this account for internal capture.

Populations Included in the Analysis

Stanford anticipates that Additional Housing Alternative B will continue to cover all of its lands in unincorporated Santa Clara County. However, the General Use Permit does not apply to land uses within those areas that are permitted as of right (e.g., the single-family and two-family residences in the faculty/staff subdivision), and therefore are not included in this VMT analysis. In addition, Stanford does not propose development under Additional Housing Alternative B in two areas zoned for medium-density faculty and staff housing (the Peter Coutts housing area and the Olmsted Terrace housing area). Nor does Stanford propose development outside the Academic Growth Boundary, including on the Stanford Golf Course. Therefore, these areas are not included in the VMT analysis.

Benchmarks Included in the Analysis

Based on the OPR guidance described above, the numeric benchmarks against which Additional Housing Alternative B worker and resident VMT were compared are:

- the Bay Area regional daily average home-based-work VMT per worker; and
- the Bay Area regional daily average home-based VMT per capita.

The VTA transportation model is a trip-based model developed and validated for the estimation of trips made for home-based work, home-based non-work and non-home based trips. OPR's *Technical Advisory* states that home-based trips can be the focus for analysis of residential projects, and home-based-work trips can be the focus of the analysis for office projects. Therefore, the guidance, residential and worker VMT for Additional Housing Alternative B were assessed independently, and the project-specific data used in the evaluation

[89] The Draft EIR Expressed this criterion as follows: Residential Per Capita Daily VMT: A project exceeding *both* existing household daily VMT per capita in the aggregate of all incorporated jurisdictions in the County minus 15 percent, *and* existing regional household daily VMT per capita minus 15 percent. Because regional household daily VMT per capita was higher than the aggregate of all incorporated jurisdictions in the County, the Draft EIR used 15 percent below regional household daily VMT per capita as the benchmark for analysis. Use of a standard of 15 percent below regional household daily VMT per capita is consistent with OPR's updated Technical Advisory and the simplified criterion is used in this recirculated Draft EIR.

- VTA model is a reliable source to establish the Bay Area and Santa Clara County average daily VMT per worker and per capita at an aggregate level.

OPR's April 2018 *Technical Advisory* continues to recommend that regional, not city or county-level, VMT averages should be used for judging impacts of employment-generating projects. The April 2018 *Technical Advisory* also continues to recommend that the benchmark for residential projects should be either regional averages or a weighted average of all cities within the county. In this case, the regional average represents the benchmark for residential VMT generation.

OPR's April 2018 *Technical Advisory* recommends setting thresholds of significance at 15 percent below the regional benchmark for average daily VMT per worker[90] or per capita. Taking all of these recommendations into account, **Table 7B.15-15** indicates the VMT generation thresholds to be applied to Additional Housing Alternative B.[91]

TABLE 7B.15-15
APPLICABLE BENCHMARKS AND NUMERIC SIGNIFICANCE THRESHOLDS

Traveller and Trip Type	Daily VMT per Capita	
	Benchmark (region-wide average)	Numeric Threshold of Significance (85% of benchmark)
Worker Home-Based-Work Daily VMT per Worker	16.18	13.75
Resident Home-Based Daily VMT per Capita	17.33	14.73

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

Campus Population

The typical weekday population on the Stanford campus is made up of students, faculty, staff, contractors and other onsite workers, visitors, and household members of students, faculty and staff residing on the campus. The provision of additional on-campus housing under Additional Housing Alternative B would not increase student enrollment or change the total number of employees on the campus in 2035. Additional Housing Alternative B would reduce the number of commuters traveling to the campus compared to the proposed 2018 General Use Permit.

90 OPR's Technical Advisory does not address travel by college students. The omission of VMT from students traveling to and from the campus would leave a large gap in the VMT picture for Stanford; therefore, student trips are included in the assessment of Worker VMT. While student travel behavior is similar to that of faculty and staff, a sensitivity analysis was prepared for Worker VMT that did not include the student travel. This analysis was prepared to document that inclusion of the students did not overly influence or obscure the level of VMT per worker generated by the faculty and staff alone.

91 In addition to numeric comparisons to regional benchmarks. OPR presents a third approach that can be used to assess the significance of VMT -- evaluation of the change in total VMT caused by the project. OPR states the third method is useful when a project is likely to divert or substitute trips. This method was considered for evaluation of trips by visitors to the Stanford campus; however, it was determined that the method does not appear to be well-suited to the specifics of Additional Housing Alternative B. OPR has not provided guidance as to how an agency should assess significance using this method if the relevant visitor trips are not of the type that would be redistributed from one location to another.

However, there would be a substantial increase in campus residential population under Additional Housing Alternative B compared to the proposed Project.

Table 7B.15-16 shows the changes in campus resident populations for Additional Housing Alternative B compared to the proposed Project. Additional Housing Alternative B would increase the total campus resident population by 3,126 persons compared to the campus resident population anticipated under the 2018 General Use Permit. Of this population, 1,849 new residents would be spouses and other household members in the added housing. Overall, campus residents would increase by 16 percent compared to the proposed Project.

TABLE 7B.15-16
CAMPUS RESIDENT POPULATIONS – ADDITIONAL HOUSING ALTERNATIVE B

Condition	Total Residents	Stanford Affiliates	Spouses & Other Household Members
Fall 2015 Existing Conditions	12,592	11,468	1,124
Fall 2018 Baseline	13,028	11,888	1,140
2018 General Use Permit (Project)	19,353	17,116	2,237
Additional Housing Alternative B	22,479	18,393	4,086
Change from 2018 General Use Permit	+3,126	+1,277	+1,849
	+16.2%	+7%	+83%

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

The additional Stanford affiliates living on campus would no longer commute from off-campus so worker trip lengths would be shortened. The additional campus residents, including Stanford affiliates, spouses and other household members, would make trips to and from the campus for a variety of purposes, including work, school, recreation, shopping and entertainment. The campus resident populations presented in Table 7B.15-16 are limited to the study area defined by the SB 743 VMT Analysis prepared for the Draft EIR.

Fall 2035 VMT Generation - Additional Housing Alternative B

Using the methodology described in the Draft EIR (pages 5.15-153 to 5.15-154), estimates of worker and resident VMT for Fall 2035 were prepared for Additional Housing Alternative B using the following assumptions. Between Fall 2018 to Fall 2035, the campus is anticipated to add 6,288 employees and contractors with an increase in enrollment of 2,900 students. In 2035, the General Use Permit study area would include 29,915 employees and contractors and an enrollment of 19,513 students. The worker population including employees, contractors and students would be 49,428. These are the same growth assumptions used in the 2035 VMT analysis for the proposed Project.

However, under Additional Housing Alternative B, the campus resident population within the study area would increase by 9,451 persons including Stanford affiliates, spouses and other household members between Fall 2018 and Fall 2035. This represents an increase in resident population of 3,126 persons over the proposed Project.

In addition to an increase in the campus residents, the additional housing would create the need for more construction workers on the campus. For Additional Housing Alternative B, it was assumed that, on average an additional 23 construction workers would be on campus on a typical day.

The resulting Fall 2035 VMT for campus workers and residents is indicated in **Table 7B.15-17**. Additional Housing Alternative B home-based work VMT per worker, and home-based VMT per resident would be below the SB 743 thresholds, allowing a determination of less-than-significant impacts for Additional Housing Alternative B.

TABLE 7B.15-17
FALL 2035 TYPICAL WEEKDAY VMT – ADDITIONAL HOUSING ALTERNATIVE B

Traveler	Trip Purposes	Population	VMT	VMT per Person[a]	SB 743 Threshold VMT per Person (see Table 7B.15-15)	Finding
Workers	HBW	49,451	216,134	4.37	13.75	Less than Significant
Residents	HBW + HBO	22,479	262,899	11.70	14.73	Less than Significant

[a] Worker HBW trips were adjusted by +2% and Resident HB trips were adjusted by +3% to reflect changes in trip length derived from the VTA model.

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

VMT Comparison and Conclusions

Table 7B.15-18 summarizes the SB 743 VMT calculations for the 2018 General Use Permit and Additional Housing Alternative B, focusing on average daily trips by Stanford-affiliated workers between their homes and the Stanford campus, and average daily trips by Stanford campus residents to all destinations. SB 743 VMT calculations are expressed as VMT per worker and VMT per resident. Adding on-campus housing would reduce the average daily VMT per worker by 3.4% under Additional Housing Alternative B, as compared to the proposed Project. These reductions represent fewer trips by Stanford affiliates traveling to and from the campus for work and shorter trip lengths for those Stanford workers living on campus.

TABLE 7B.15-18
COMPARISON OF SB743 VEHICLE MILES TRAVELLED

	Worker w/ Student		Residents	
Condition	**VMT**	**VMT/Worker**	**VMT**	**VMT/Resident**
2018 General Use Permit (Project)	223,842	4.53	207,986	10.75
Additional Housing Alternative B	216,134	4.37	262,899	11.70
Change from 2018 General Use Permit	-7,708	-0.16	+54,913	+0.95
	-3.4%	-3.5%	+26%	+9%

SOURCE: Fehr & Peers, May 2018 (see Appendix ALT-VMT)

The addition of on-campus housing would increase the average daily VMT per resident by 9% under Additional Housing Alternative B, as compared to the proposed Project. Campus residents include Stanford affiliates, spouses and other household members living in the campus housing units. The daily VMT of residents is for all trip types including work, shopping, recreational, school (K-12), etc. The increase in VMT per resident would be due to the change in the on-campus proportion of faculty/staff housing units as compared to student beds. Faculty/staff units generate higher VMT per resident than student beds.

Impact Evaluation

Impact 7B.15-12: Additional Housing Alternative B would be located within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor. (*Less than Significant*)

As explained above, OPR has proposed that lead agencies generally should presume that residential, retail, and office projects, as well as mixed-use projects that are a mix of these uses, proposed within one-half mile of an existing major transit stop or an existing stop along a high-quality transit corridor have a less-than-significant impact on VMT. A major transit stop is a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A high-quality transit corridor means a corridor with fixed route bus with service intervals no longer than 15 minutes during peak commute hours.

Given the major transit stops and stops along high quality transit corridors on and near the Stanford campus, and land area with ½ mile of such stops and corridors, development under Additional Housing Alternative B would constitute infill development that represents increased intensity and density compared to existing levels at Stanford. Stanford is located adjacent to Caltrain stations, and is well-served by transit. Based on the *Revised Proposed Changes to the CEQA Guidelines* proposed by OPR for assessment of VMT, like the proposed Project, Additional Housing Alternative B can be presumed to result in a less-than-significant impact.

Mitigation: None required.

Impact 7B.15-13: Additional Housing Alternative B VMT would not exceed the numeric thresholds recommended by OPR. (*Less than Significant*)

Even though Additional Housing Alternative B would be presumed to result in a less-than-significant impact under OPR's proposed CEQA Guidelines amendments (see Impact 7B.15-12, above), this EIR also assesses Additional Housing Alternative B's consistency with the numeric significance thresholds suggested by OPR.

Worker and residential daily VMT per capita generated by Additional Housing Alternative B in 2035 and the VMT Thresholds of Significance are shown in Table 7B.15-17. Additional Housing

Alternative B home-based work VMT per worker, and home-based VMT per resident are below the significance thresholds, resulting in a less-than-significant impact on VMT.

Mitigation: None required.

Utilities and Service Systems[92]

Approach to Analysis

Water Supply

Project Water Demand

Similar to the WSA prepared for the proposed Project, the WSA for Additional Housing Alternative B used pre-drought conditions (Fiscal Year 2012-13) as the starting point because this captures pre-project conditions more accurately than subsequent years during which drought conditions temporarily but substantially affected campus water usage. The 2012-13 water usage were increased as appropriate to account for the remaining development that would occur under the 2000 General Use Permit, and the increase in water demand that would be associated with development under this alternative. Compared to the proposed Project, this alternative included increased potable water demand with the additional student housing and faculty/staff housing, using the same housing water demand rates for these categories as used in the WSA for the proposed Project. Although it is possible that additional housing constructed for this alternative may replace some existing landscaping, the WSA conservatively assumed there would be no change in irrigation demand from the analysis for the proposed Project.

Total Projected Water Demand and Supply

Table 7B.16-1 presents a summary of actual water demands and supplies for FY 2012-13 and FY 2015-16, and the projected water demands and supplies in 2035 with buildout of Additional Housing Alternative B.

Dry-Year Scenarios

In order to determine the adequacy of water supplies to meet project demand in non-normal or wet weather years, the WSA for Additional Housing Alternative B also considered Stanford's projected water demands and supplies for normal, single dry, and multiple dry water years; see **Table 7B-16-2** with buildout of Additional Housing Alternative B in 2035. As was the case for the proposed Project, the projection of non-potable usage for this alternative assumes that surface water is the primary source of irrigation supply, and groundwater is used to meet the remaining demand.

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92 The Additional Housing Alternative B environmental analysis presented herein relies in part on a housing alternatives Water Supply Assessment (WSA) prepared by Schaaf & Wheeler Consulting Civil Engineers for Stanford (see Appendix ALT-WSA in this document), a wastewater analysis prepared by Stanford (see Appendix ALT-WAW); and a solid waste analysis prepared by Stanford (see Appendix ALT-SOL). These analyses were independently peer reviewed by ESA.

TABLE 7B.16-1
SUMMARY OF POTABLE AND NON-POTABLE WATER SUPPLY AND DEMAND (MILLION GALLONS/DAY) – ADDITIONAL HOUSING ALTERNATIVE B

Water Use Category	FY 2012-13 (Pre-Drought) Actual	FY 2015-16 (Actual)	2035 Projected (with buildout of Additional Housing Alternative B)
Demand			
Potable	2.10	1.39	2.71
Non-Potable	1.23	0.81	1.35
Total	**3.33**	**2.20**	**4.06**
Supply			
Potable	2.91	2.91	3.03
Groundwater	1.52	1.52	1.52
Surface Water	1.12	1.12	1.12
Total	**5.55**	**5.55**	**5.67**

NOTES: Numbers are rounded.

SOURCE: Schaaf & Wheeler, 2018 (Appendix ALT-WSA)

TABLE 7B.16-2
SUMMARY OF PROJECTED DRY YEAR SUPPLY AND DEMAND - ADDITIONAL HOUSING ALTERNATIVE B

Water Use Category	Water Year Type				
	Normal Year	Single Dry Year	Multiple Dry Years		
			1	2	3
Supply					
Potable Supply (SFPUC)					
ISG[a]	3.03	2.51	2.51	2.18	2.18
ISL[b]	2.91	2.42	2.42	2.10	2.10
Surface Water Supply	1.12	0.94	0.94	0.06	0.06
Groundwater Supply	1.52	1.52	1.52	1.52	1.52
Total Supply (ISG)	**5.67**	**4.97**	**4.97**	**3.76**	**3.76**
Total Supply (ISL)	**5.55**	**4.88**	**4.88**	**3.68**	**3.68**
2035 Demands					
Potable Demand	2.71	2.73	2.73	2.31	2.03
met by ISL	2.71	2.51	2.51	2.18	2.03
met by groundwater	0.00	0.22	0.22	0.13	0.00
Non-potable Demand	1.35	1.42	1.42	1.08	1.08
met by surface water	1.12	0.94	0.94	0.06	0.06
met by ground water	0.23	0.48	0.48	1.02	1.02
Total Demand	**4.33**	**4.42**	**4.42**	**3.61**	**3.31**

NOTES: Numbers are rounded.

[a] ISG = Individual Supply Guarantee allocation from SFPUC
[b] ISL = Interim Supply Guarantee Limitation allocation from SFPUC

SOURCE: Schaaf & Wheeler, 2017 (Appendix ALT-WSA)

With respect to dry years, in its 2015 UWMP, the SFPUC advises wholesale customers to anticipate seeing their supply allocations reduced to as low as 83 percent of normal for a single dry year. In multiple dry year scenarios, supply might be further reduced to 72 percent of normal. Therefore, as was assumed for this alternative's analysis, the assumed dry-year supply projections assumed for Additional Housing Alternative B are based on the 83 percent and 72 percent planning factors from the SFPUC.

Impact 7B.16-1: Additional Housing Alternative B would result in the expansion of existing on-campus infrastructure, the construction of which could cause significant environmental effects. (*Significant*)

As with the proposed 2018 General Use Permit, Additional Housing Alternative B would accommodate construction of campus infrastructure improvements to support new development that would occur under the alternative, including water and wastewater improvements. Since this alternative would involve more on-campus housing development and infrastructure than the proposed Project, it would therefore, involve also more construction than would occur under the proposed Project.

These effects could be associated with construction, such as noise, archeological impacts, air quality impacts such as emissions of dust and other pollutants, including diesel exhaust, and temporary street closures or other traffic obstructions. As with the proposed Project, since on-campus utility improvements are part of the overall anticipated development program under the alternative, the associated construction-related impacts associated with new, relocated or replaced recreational facilities are addressed in the construction impact analyses above under Air Quality, Biological Resources, Cultural Resources, Noise and Vibration, and Transportation and Traffic. Similar to those mitigation measures identified for the proposed Project, the mitigation measures outlined in these respective topics for this alternative to reduce construction related impacts would similarly apply to infrastructure improvements.

Mitigation: Implement the following mitigation measures, as needed for construction of infrastructure improvements:

Air Quality

Mitigation Measure 7B.2-2: *Best Management Practices for Controlling Particulate Emissions during Construction.*

Mitigation Measure 7B.2-3(a)-(b): *Mitigation for Construction TACs and $PM_{2.5}$.*

Biological Resources

Mitigation Measure 7B.3-1(a)-(e): *Mitigation for nesting birds during construction.*

Mitigation Measure 7B.3-2(a)-(d): *Mitigation for special-status bat species during construction.*

Mitigation Measure 7B.3-3(a)-(c): *Mitigation for San Francisco dusky-footed woodrat during construction.*

Mitigation Measure 7B.3-4(a)-(b): *Mitigation for special-status plant species during construction.*

Mitigation Measure 7B.3-6(a)-(c): *Mitigation for steelhead during construction.*

Mitigation Measure 7B.3-7(a)-(b): *Mitigation for riparian habitat during construction.*

Mitigation Measure 7B.3-8(a)-(b): *Mitigation for native oak woodland during construction.*

Mitigation Measure 7B.3-9(a)-(c): *Mitigation for wetlands during construction.*

Mitigation Measure 7B.3-11(a)-(c): *Mitigation for protected trees during construction.*

Cultural Resources

Mitigation Measure 7B.4-2(a)-(b): *Mitigation for protection of archaeological resources during construction.*

Mitigation Measure 7B.4-3: *Mitigation for protection of paleontological resources during construction.*

Hazardous Materials

Mitigation Measure 7B.8-2(a)-(c): *Mitigation for potentially contaminated soils during construction.*

Hydrology and Water Quality

Mitigation Measure 7B.9-1: *Review historic wells survey.*

Noise and Vibration

Mitigation Measure 7B.11-1: *Construction Noise Control Measures and Noise Control Plan for Off-Site Receptors.*

Mitigation Measure 7B.11-2: *Construction Noise Control Measures and Noise Control Plan for On-Site Receptors.*

Mitigation Measure 7B.11-3: *Construction Vibration Reduction Plan.*

Transportation and Traffic

Mitigation Measure 7B.15-1: *Construction Traffic Control Measures.*

Significance after Mitigation: Less than Significant.

Impact 7B.16-2: Additional Housing Alternative B development would increase the demand for water, however it would be adequately supplied from existing entitlements and resources. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated water demand than the proposed 2018 General Use Permit. As discussed in Section 5.16, Utilities and Service Systems, Stanford receives its water from water purchased wholesale from the SFPUC, local surface water supplies, and groundwater. The WSA prepared for this alternative (see Approach to Analysis, above) evaluated if the total projected water supplies, determined to be available for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with this alternative.

With respect to normal years, as summarized in Table 7B.16-1, the WSA estimated that Stanford's total water demand upon buildout of this alternative would be approximately 4.06 mgd, consisting of a potable water demand of 2.71 mgd (an increase of 0.27 mgd over the proposed Project), and a non-potable water demand of 1.35 mgd (same as the proposed Project).

Consistent with the WSA prepared for the proposed Project, Stanford's overall water supply with buildout of this alternative would be similar to conditions at present. Stanford's potable water supply allocation from the SFPUC will be 3.03 mgd in 2018, when the ISL expires and the ISG is reinstated. During normal water years, this water allocation would be sufficient to accommodate the potable water demand through buildout of this alternative. Stanford would also maintain existing water rights for surface water diversion of non-potable water of up to 1.12 mgd. In addition, a sustainable groundwater supply of up to 1.52 mgd would be available to provide a supplemental source of non-potable water to serve the alternative. Together, the local surface and groundwater sources would be sufficient to accommodate the non-potable water demand through buildout of the alternative. Collectively, during normal water years, the total estimated water supply 5.67 mgd would be more than adequate to accommodate the total projected water demand of 4.06 mgd with buildout of the alternative.

As shown in Table 7B.16-2, under this alternative, in single dry year and multiple dry water year scenarios, Stanford would need to supplement its potable water supply from SFPUC with treated groundwater from its wells in order to accommodate the estimated increase in potable water demand from the additional on-campus housing.[93] As under the proposed Project, in multiple dry year scenarios, Stanford would reduce its total potable water demand by 15 percent in the second year and 25 percent in the third year.

Similar to the proposed Project, under this alternative in a single dry year, Stanford's non-potable water demands for plant irrigation would be expected to increase slightly. However, as under the proposed Project, under this alternative, Stanford would implement water conservation measures to reduce non-potable water use by 20 percent in the second and third years of a multiyear drought.

[93] In a single dry water year / multiple dry water year 1, and multiple dry water year 2, the WSA estimates Stanford would provide treated groundwater from its wells to supplement the amounts of 0.22 mgd, and 0.13 mgd, respectively.

In conclusion, as was the case with the proposed Project, there would be sufficient water supplies to accommodate the water demand from buildout of Additional Housing Alternative B through existing entitlements and resources under normal, single dry, and multiple dry water years. Thus, while this alternative would generate an increased demand for water compared to the Project, this impact would be similarly less than significant.

Mitigation: None required.

Impact 7B.16-3: Additional Housing Alternative B would increase demand for wastewater treatment, but would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated wastewater generation, and correspondingly, and increased need for wastewater treatment, than the proposed 2018 General Use Permit. As discussed in Section 5.16, wastewater generated by Stanford is conveyed off-site to the City of Palo Alto Regional Wastewater Quality Control Plant (RWQCP) for treatment. The RWQCP is owned and operated by the City of Palo Alto, and is funded by several partners, including Stanford.

The analysis of wastewater generation for the proposed Project presented in Section 5.16, Utilities and Service Systems, used a highly conservative methodology that assumed the entirety of the net increase in potable water demand for the proposed Project would become wastewater. However, new data provided by Stanford based on historic metering of Stanford's wastewater flows shows that Stanford's average annual wastewater demand is approximately 70 percent of its average annual domestic water usage. This is considered a more refined approach to estimate wastewater flows attributable to the proposed Project and additional housing alternatives. Use of the 70 percent factor for these scenarios would still be conservative, since it does not account for future conservation measures, such as improved connectivity to the campus recycled water system to these uses, which will serve to further reduce future wastewater flows from the campus.

Using this refined methodology for estimating wastewater generation for the proposed 2018 General Use Permit, Stanford's total projected potable wastewater generation in 2035 with the proposed 2018 General Use Permit would be 1.52 mgd wastewater (this includes wastewater flows from existing development, remaining development to be built under the 2000 General Use Permit plus new development under the proposed Project). These total flows would be within the 2.11 mgd capacity of the RWQCP owned by Stanford. Thus, while development under the proposed 2018 General Use Permit would increase demand for wastewater treatment, the increase would be within its authorized volumes, and would not exceed wastewater treatment requirements by the RWQCB. Consequently, similar to the finding reached in Section 5.16, the proposed Project would generate a less-than-significant impact to wastewater treatment.

Similarly, using this refined methodology for estimating wastewater generation for Additional Housing Alternative B, Stanford's total projected potable wastewater generation in 2035 with this

alternative would be 1.71 mgd wastewater, an increase of 0.19 mgd over the proposed Project). These total flows would be within the 2.11 mgd capacity of the RWQCP owned by Stanford. Thus, similar to the proposed Project, while development under this alternative would increase demand for wastewater treatment, the increase would be within its authorized volumes, and would not exceed wastewater treatment requirements by the RWQCB. Consequently, as with the proposed Project, this alternative would generate a less-than-significant impact to wastewater treatment.

Mitigation: None required.

Impact 7B.16-4: Additional Housing Alternative B would discharge additional flows to the municipal sewer and drainage system, but not to an extent which would exceed the facilities' capacity in light of existing commitments. (*Less than Significant*)

Additional Housing Alternative B would involve more on-campus housing and associated wastewater generation than the proposed 2018 General Use Permit. Wastewater generated by Stanford is collected in its sanitary sewer system and then conveyed off-site to and through City of Palo Alto sewer lines to the RWQCP. Using the refined methodology for estimating wastewater generation presented in Impact 7B.16-3, above, for the proposed 2018 General Use Permit, an increase in Stanford wastewater generation of approximately 0.42 mgd (conservatively accounting for the proposed 2018 General Use Permit increase and contribution from any remaining unbuilt development under 2000 General Use Permit), would be equivalent to an average increase in daily flow of approximately 292 gpm. This increased flow added to measured dry weather peak flow of 1,700 gpm would remain well below this City sewer main's capacity at 4,370 gpm.

Using the same refined methodology for this alternative, an increase in Stanford wastewater generation of approximately 0.61 mgd (accounting for the alternative and contribution from any remaining unbuilt development under 2000 General Use Permit), would be equivalent to an average increase in daily flow of approximately 424 gpm (an increase of 132 gpm over the proposed Project). Similar to the proposed Project, this increased flow added to measured dry weather peak flow of 1,700 gpm would remain well below this City sewer main's capacity at 4,370 gpm.

Given these results, and considering that the City of Palo Alto indicates there are no capacity deficiency issues for any of the City collection mains that carry wastewater flows from the campus to the RWQCP, the increase in flow under this alternative, would not exceed the City of Palo's sewer collection capacity. Similar to the conclusion reached for the proposed Project, the impact under this alternative would be less than significant.

Mitigation: None required.

Impact 7B.16-5: Additional Housing Alternative B construction would result in an increased generation of solid waste, but would not exceed permitted capacity to accommodate the Project's solid waste disposal needs or conflict with federal, State, and local statutes and regulations related to solid waste. *(Less than Significant*)

Additional Housing Alternative B would involve more construction and demolition activities than the proposed 2018 General Use Permit and consequently, would generate more construction debris, some of which would require disposal. The alternative would be expected to result in an average of approximately 292,500 square feet of construction (an increase of 67,000 square feet over the proposed Project) and 51,500 square feet of demolition (an increase of 1,200 square feet over the proposed Project) per year through 2035. Based on the most conservative construction and demolition waste estimates provided by the USEPA (similar to those estimated for the proposed Project in Section 5.16), the annual construction and demolition under this alternative would result in an estimated 4,710 tons of solid waste per year (an increase of 241 tons per year over the proposed Project). Assuming 50 percent of all construction waste is diverted from landfills through source reduction, recycling, and composting activities per Stanford procedures and policies, consistent with CCR Title 24, the Project would generate an estimated 2,355 tons of waste per year (an increase of 120 tons per year over the proposed Project) that would be disposed at a landfill.

As discussed in Section 5.16, as of 2012, Zanker Road Landfill (which currently receives construction/demolition debris from Stanford) had a total remaining capacity of 700,000 cubic yards with an expected closure date of 2029. In addition, other existing landfills are available that would remain operational could be utilized and would have more than adequate capacity to accommodate the construction debris generated by this alternative. As a result, similar to the proposed Project, construction debris generated under this alternative would not exceed permitted landfill capacity nor violate any state or federal regulation related to solid waste, and similar to the proposed Project, the impact from this alternative would be less than significant.

Mitigation: None required.

Impact 7B.16-6: Operation of Additional Housing Alternative B would comply with federal, state, and local statutes and regulations related to solid waste and would be adequately served by existing landfills with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (*Less than Significant*)

Additional Housing Alternative B would involve more housing development, and consequently, would generate more solid waste than the proposed 2018 General Use Permit requiring disposal. Using the same per capita generation rates as those used for the proposed Project in Section 5.16, this alternative would generate a net increase of approximately 7,749 tons of discards per year (an increase of 1,368 tons over the proposed Project), consisting of approximately 2,827 tons of landfill waste per year (an increase of 499 tons over the proposed Project), and 4,922 tons of recyclables per year (an increase of 869 tons over the proposed Project). When considered in combination with the existing waste generation, Stanford would generate approximately 32,434 tons of discards per year, consisting of 11,772 tons of landfill waste per year, and 20,662 tons of recyclables per year with this alternative.

As discussed in Section 5.16, the Newby Island Sanitary Landfill (which currently receives the majority of Stanford's solid waste) has maximum permitted throughput for up to 4,000 tons of waste per day. Similar to the proposed Project, the total operational solid waste that would be generated under this alternative that requires landfilling would represent less than one percent of the maximum daily permitted throughput at this landfill. Furthermore, this landfill has a remaining capacity of 21.2 million cubic yards, with an anticipated closure in January 2041; and therefore can accommodate solid waste disposal needs of the Project through the duration of this alternative.

Based on the existing disposal rates and continued waste diversion by residents and employees of Stanford, this alternative, similar to the proposed Project, would continue to allow Stanford be in compliance with CALGreen and AB 939. Given the above, operation of this alternative would not exceed available permitted landfill capacity and would comply with federal, state, and local statutes and regulations related to solid waste diversion; and similar to the proposed Project, the impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact 7B.16-7: Implementation of Additional Housing Alternative B, in combination with past, present, and future projects would contribute to cumulative increases in demand for water supplies. (*Less than Significant*)

The WSA for Additional Housing Alternative B demonstrates there, similar to that determined for the proposed Project, there are adequate water supplies to accommodate the water demand from buildout of this alternative through existing entitlements and resources under normal and sequentially dry weather years.

As discussed in Section 5.16, Stanford provides usage statistics and demand projections to the SFPUC and SCVWD who incorporate this data into their respective UWMPs. The SFPUC and SCVWD UWMPs, as well as the City of Palo Alto's 2015 UWMP, indicate that each urban water supplier has sufficient water supply to meet demand in normal years and sequential dry-weather years. The SFPUC's 2015 UWMP considers that Stanford's purchase requests will increase, and the SCVWD UWMP also includes increases in Stanford's total water demand projections. The WSA prepared for this alternative determined that the Stanford's projected potable water demand for this alternative, while higher than the proposed Project, would still be met through Stanford's ISG under normal water years, and could be supplemented with treated groundwater in single or multiple dry water years. The WSA showed Stanford's non-potable water demand under this alternative would be similar to the Project, and would continue to be met by existing surface water entitlements and groundwater.

Similar to the proposed Project, the cumulative water supply needs of this alternative in combination with past, present, and reasonably foreseeable projects within the SFPUC wholesale service territory during normal, single-, and multiple-dry years could be met by 1) State voluntary and mandatory water conservation and water efficiency measures, 2) SFPUC voluntary and

mandatory water conservation and water efficiency measures, 3) City water conservation measures called for in the municipal code and emergency conservation ordinance, 4) BAWSCA's long-term water supply strategy, and 5) SFPUC's WSIP improvements as identified in each of their UWMPs.

Cumulative projects would contribute to additional water demands. However, future projects would be subject to the same water conservation efforts, water efficiency measures, and water supply improvements to balance supply and demand as would this alternative required by the state and regional enforcement bodies. In particular, cumulative projects within the SFPUC wholesale service area would be subject to State and SFPUC voluntary and mandatory conservation measures to reduce usage, the BAWSCA's long-term water supply strategy to enhance supplies, and the SFPUC's WSIP projects to improve the regional water system reliability and capacity. There would be adequate water supplies to serve this alternative in combination with other reasonably foreseeable projects in the SFPUC wholesale service area.

Therefore, cumulative impacts to water supply would be less than significant.

Mitigation: None required.

Impact 7B.16-8: Implementation of Additional Housing Alternative B, in combination with past, present, and future projects would contribute to cumulative increases in demand for wastewater treatment. (*Less than Significant*)

The cumulative setting for wastewater treatment would extend to the entire service area of the RWQCP. Under each of the growth scenarios considered in the update to the City of Palo Alto's Comprehensive Plan, future wastewater generation would increase by less than five percent of the available treatment capacity at the RWQCP, which would be far below its design and permitted wastewater treatment capacity. As addressed under Impact 7B.16-3, similar to that determined for the proposed Project, the future increases in wastewater flows from this alternative would be within the 2.11 mgd capacity permitted by the RWQCP for Stanford's use.

Based on the cumulative wastewater treatment demand anticipated under buildout of the 2030 Comprehensive Plan, demand generated by residents within Palo Alto, Stanford, and the remaining service area for the RWQCP would be below the facility's excess capacity. As a partner in the RWQCP, Stanford pays it fair share of capital costs, and would continue to do so over the life of this alternative.

With adequate capacity for cumulative wastewater treated at RWQCB, treatment would be provided according to the wastewater treatment requirements documented in the NPDES permit for the RWQCP and enforced by the San Francisco RWQCB. Therefore, cumulative development combined with this alternative would not exceed wastewater treatment requirements, and cumulative impacts to wastewater treatment would be less than significant.

Mitigation: None required.

Impact 7B.16-9: Implementation of Additional Housing Alternative B, in combination with past, present, and future projects would contribute to cumulative increases in demand for landfill space. (*Less than Significant*)

While Stanford currently relies primarily on the Newby Island Sanitary Landfill and Zanker Road Class III landfill, countywide, there are 20 additional landfills for which capacity is available. All past, present, and foreseeable future projects have been and would be required to demonstrate that adequate landfill capacity is available to accommodate increased waste prior to any project approvals. Such projects have been and would also be required to comply with the recycling and reuse measures and targets established by CALGreen and AB 939 for construction and operational waste. Therefore, this alternative, in conjunction with other development, would not have a significant cumulative impact associated with solid waste, and this alternative's cumulative impact would be less than significant.

Mitigation: None required.

Environmental Consequences of Stanford Providing Off-Campus Housing under Additional Housing Alternative B

Impact 7B.17-1: Under Additional Housing Alternative B, the construction and/or operation of off-site housing by Stanford would result in off-site environmental impacts. (*Significant*)

Although Additional Housing Alternative B assumes that half of the new housing demand would be provided on-campus, under this alternative, Stanford could elect to, subject to approval by the County, offset some or all of the incremental off-campus housing demand by providing off-campus housing. The growth in Stanford student, faculty, staff, postdoctoral student and other worker households that would live off-site would be distributed among many jurisdictions in the Bay Area. Assuming that future off-campus residents distribute in patterns similar to how current off-campus residents live, these jurisdictions are listed in Draft EIR Table 5.12-11.

With respect to affordable housing, as under the proposed Project, affordable housing impact in-lieu payments could be made under this alternative would support development of affordable housing within one-half mile of any major transit stop or a high-quality transit corridor in the Bay Area.

Based upon Stanford's historical development of off-campus housing projects in the cities of Palo Alto, Menlo Park, and Los Altos, and the location of residence of existing Stanford affiliates based on Stanford's 2016 Commute Survey, the potential indirect impacts of distributing the Additional Alternative B's off-campus housing demand within the cities of Palo Alto, Menlo Park, and Mountain View provide a representative analysis of the indirect impacts that would more broadly occur among the Bay Area jurisdictions. Specifically, as described in the Draft EIR, Palo Alto is currently home to approximately 19 percent of off-campus students, faculty, and staff; Menlo Park has 9 percent; and Mountain View has nearly 10 percent.[94] Therefore, the potential effects of any

[94] Stanford University 2018 General Use Permit Draft EIR Appendix PHD, Table 13.

off-campus housing development projects that Stanford would potentially provide under Additional Housing Alternative B would disproportionately affect these jurisdictions compared to other communities in the Bay Area that house Stanford affiliates.

All three cities have adopted updates to their respective general plans within the last six years. The effects of population growth expected to occur during the next several decades resulting from such growth, including from residential housing development that may be associated with Stanford off-campus housing demand, have been analyzed in the Final EIRs for each respective general plan. While there are differences regarding how the analyses were conducted and how they are described in the Final EIRs for each plan, significant impacts were identified for all three communities regarding air quality and transportation. It is reasonable to assume that the general plans for these communities accounted for the population growth associated with Stanford affiliates residing within each respective jurisdiction and that any off-campus housing provided by Stanford in more distant communities would have similar impacts as those identified below. Of course, the effects of population growth anticipated in those three Final EIRs include the impacts of all growth, only some of which could be growth caused indirectly by this alternative.

Any new off-campus housing constructed as result of this alternative, including affordable housing units, would be required to comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. For purposes of this EIR, the impacts associated with the demand for off-site housing units are being analyzed as indirect impacts of this alternative.

City of Palo Alto

Palo Alto adopted an update to its general plan, *Comprehensive Plan 2030*, on November 13, 2017 (City of Palo Alto, 2017a). The Final EIR prepared for the update analyzed six unique scenarios for growth in Palo Alto through 2030 (City of Palo Alto, 2017b). The total number of new housing units constructed by 2030 under the six scenarios ranged from a low of 2,720 under the "business as usual" scenario to 6,000 units under the most aggressive housing scenario. The City Council developed a "Preferred Scenario" that would result in 3,545 to 4,420 new housing units in the city by 2030.

The effects of such growth anticipated to occur under the general plan update were considered in the Final EIR. Most impacts were determined to be less than significant through implementation of identified mitigation measures. However, several impacts related to air quality and transportation/traffic were determined to remain significant and unavoidable, as summarized below:

- AIR-2: Implementation of the proposed Plan could violate an air quality standard; contribute substantially to an existing or project air quality violation; and/or result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). (All Six Scenarios)

- TRANS-1: Implementation of the project would cause an intersection to drop below its motor vehicle level of service standard, or deteriorate operations at representative intersections that already operate at a substandard level of service. (All Six Scenarios)

- TRANS-3: Implementation of the project would cause a freeway segment or ramp to drop below its level of service standard, or deteriorate operations that already operate at a substandard level of service. (All Six Scenarios)
- TRANS-6: Implementation of the project would impede the operation of a transit system as a result of congestion. (All Six Scenarios)

Regarding air quality, implementation of the general plan under all scenarios would generate a substantial increase in criteria air pollutant emissions from on-site sources, vehicle trips, and energy use, which would result in a significant, unmitigable impact. Emissions generated during construction associated with individual development projects permitted under the proposed plan also would generate significant levels of criteria air pollutants and toxic air contaminants. Under all six scenarios, the plan would cause multiple intersections to drop below their motor vehicle level of service standard, or deteriorate operations at intersections that already operate at a substandard level. Up to eight intersections were determined to have significant intersection impacts, and seven freeway segments or ramps on U.S. 101 and I-280 also would drop below level of service standards. In addition, the degradation in level of service would impede the operation of a transit system as a result of congestion.

City of Menlo Park

Menlo Park adopted its current general plan, *ConnectMenlo*, on November 29, 2016 (City of Menlo Park, 2016a). In addition to the proposed plan and no project alternatives, the Final EIR analyzed two reduced intensity scenarios (City of Menlo Park, 2016b). The number of housing units that could be constructed by 2040 ranged from 1,000 under the no project-business as usual alternative to 5,500 units under the proposed plan. The Final EIR prepared for the general plan identified significant and unavoidable impacts for air quality, GHG emissions, transportation and circulation, and population and housing (cumulative), as summarized below:

- AQ-2a: Despite implementation of the proposed project policies as identified in Chapter 4.2, Air Quality, Table 4.2-8, criteria air pollutant emissions associated with the proposed project would cause a substantial net increase in emissions that exceeds the Bay Area Quality Management District (BAAQMD) regional significance thresholds.
- AQ-2b: Despite implementation of the proposed project policies, criteria air pollutant emissions associated with the proposed project construction activities would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.
- AQ-5: Despite implementation of the General Plan policies, criteria air pollutant emissions associated with the General Plan would generate a substantial net increase in emissions that exceeds the Bay Area Air Quality Management District (BAAQMD) regional significance thresholds.
- GHG-1: The proposed project would result in a substantial increase in GHG emissions from existing conditions by the proposed General Plan horizon year 2040 and would not achieve the 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Additional state and federal actions are necessary to ensure that state and federally regulated sources (i.e., sources outside the City's jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the 2050 target.

- GHG-2: While the proposed project supports progress toward the long term-goals identified in Executive Order B-30-15 and Executive Order S-03-05, it cannot yet be demonstrated that Menlo Park will achieve GHG emissions reductions that are consistent with a 40 percent reduction below 1990 levels by 2030 or an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs.
- POP-4: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in a significant cumulative impacts with respect to population and housing.
- TRANS-1a: Implementation of the proposed project would exceed the City's current impact thresholds under the 2040 Plus Project conditions at some roadway segments in the study area.
- TRANS-1b: Implementation of the proposed project would result in increased delay to peak hour motor vehicle traffic exceeding the significance threshold at some of the study intersections.
- TRANS-2: Implementation of the proposed project would result in impacts to Routes of Regional Significance.
- TRANS-6a: Implementation of the proposed project would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system.
- TRANS-6b: The project would generate a substantial increase in transit riders that cannot be adequately serviced by existing public transit services, and the project would generate demand for transit services at sites more than one-quarter mile from existing public transit routes.

Similar to the determination of Palo Alto's Final EIR, implementation of Menlo Park's general plan would result in generation of criteria air pollutant emissions that would result in significant impacts during construction and operation. GHG emissions were determined to be significant and unavoidable as the emissions generated would not achieve a 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order S-03-05. Five significant impacts were identified for transportation: exceedances of impact thresholds at roadway segments; increased delay to peak hour motor vehicle traffic thresholds; impacts to Routes of Regional significance; inadequate provision of pedestrian or bicycle facilities; and generation of a substantial increase in transit riders that cannot be adequately served by existing public transit services.

City of Mountain View

Mountain View's *2030 General Plan* (adopted July 10, 2012) determined that 8,970 new housing units could be developed in the city by 2030 (City of Mountain View, 2012a). The general plan Final EIR identified significant impacts for Air Quality, Noise, and Transportation, as summarized below (City of Mountain View, 2012b):

- TRANS-1: Implementation of the Draft General Plan and GGRP would result in increased daily land-use-based vehicle miles of travel (VMT) per service population in 2030 due to population and employment growth planned within the City.

- TRANS-2a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on one roadway study segment (39. San Antonio Road between SB US 101 Ramps and Charleston Road).

- TRANS-2b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased roadway segment levels of service on several roadway study segments.

- TRANS-3a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.

- TRANS-3b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion, which would result in decreased freeway segment levels of service on several freeway study segments.

- TRANS-4a: Under Existing Plus Draft General Plan Conditions 2009, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.

- TRANS-4b: Under Draft General Plan Conditions 2030, implementation of the proposed project would increase motor vehicle traffic and congestion outside the City of Mountain View.

- AIR-2: Implementation of the Draft General Plan and GGRP could contribute to or result in a violation of air quality standards in the existing and cumulative conditions by increasing VMT greater than the population increase.

- AIR-4: Implementation of the Draft General Plan and GGRP would result in a cumulatively considerable net increase in ozone and particulate emissions.

- NOI-1: Increased traffic from projected development under the Draft General Plan and GGRP would result in a significant increase in traffic noise levels compared to existing conditions in the 2030 and cumulative conditions along some roadway and freeway segments in the City.

Regarding air quality, impacts would result from violation of air quality standards by increasing VMT greater than the population increase, and the cumulatively considerable net increase in ozone and particulate emissions. Increased traffic noise levels along some roadway and freeway segments would be significant. Significant transportation impacts included the following: increased daily land-use-based VMT due to population and employment growth; increased motor vehicle traffic and congestion, which would result in decreased roadway and freeway segments level of service; and increased motor vehicle traffic and congestion outside the city.

Conclusion

Although the above analysis focuses on the impacts in three cities where housing locations are reasonably foreseeable, similar impacts would likely occur in other Bay Area jurisdictions where off-campus housing would be located. As discussed above, any new off-campus housing that may be developed by Stanford under Additional Housing Alternative B would be required to

comply with CEQA prior to consideration of approval of the jurisdictional agency(ies) in which this off-campus housing would be located. As such, the implementation of any mitigation measures to reduce associated environmental impacts, in particular those included in or required by General Plan EIRs, would depend on the actions of those jurisdictions.

> **Mitigation Measure 7B.17-1:** The local governmental agencies in which off-campus affordable housing that would be developed by Stanford would be located can and should mitigate the environmental impacts from off-campus housing to the extent feasible.
>
> **Significance after Mitigation:** Significant and Unavoidable.

Given uncertainties in the specific location and type of off-campus housing that may occur under this alternative, it is also uncertain if feasible mitigation would exist to reduce all significant environmental impacts to a less than significant level. Further, the County cannot require or guarantee that local governments would implement mitigation measures for off-campus housing included in or required by General Plan EIRs. For these reasons, the impact is determined to be significant and unavoidable.

Ability to Meet Project Objectives

Additional Housing Alternative B would fail to achieve the primary project objective to develop the campus in a manner that reflects Stanford's historical growth rates and the growth assumptions in Stanford's approved Sustainable Development Study. The additional housing contemplated by this alternative would exceed Stanford's historic growth rates and the assumptions in the Sustainable Development Study, and would result in more intense development and construction activity than has occurred over the past several decades. The alternative would add approximately 1.2 million square feet of development to the Stanford campus above the square footage proposed by the 2018 General Use Permit.

This alternative also would also not fully achieve the following more specific project objectives to: continue to allow Stanford flexibility to develop its lands within a framework that minimizes potential negative effects on the surrounding community; and prioritize use of campus lands within unincorporated Santa Clara County for academic and academic support facilities, student housing, and faculty housing.

7.5 Summary Comparison of Alternatives

Table 7-4 provides a summary of comparison of impacts of the proposed Project and the Project Alternatives, and indicates whether the impacts of the Project Alternatives are more or less severe than those of the proposed Project.

TABLE 7-4
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.1 Visual and Scenic Resources							
5.1-1: The Project would not adversely affect scenic vistas.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.1-2: The Project could damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	LTS	- LTS	- LTS	- LTS	=/+ LTS	= LTS	= LTS
5.1-3: The Project could degrade the existing visual character or quality of the site and its surroundings.	LTS	- LTS	- LTS	- LTS	=/+LTS	+ LTS	+ LTS
5.1-4: The Project could create a new source of substantial light or glare that would adversely affect nighttime views in the area.	S/M	- LTS	- LTS	- LTS	=/+LTS	= LTS	= LTS
5.1-5: The Project, in combination with past, present, and future projects could potentially contribute to cumulative visual and scenic resource impacts.	S/M	- LTS	- LTS	- LTS	=/+ LTS	=/+ LTS	=/+ LTS
5.2 Air Quality							
5.2-1: Project construction would not result in emissions of NOx, PM, and ROGs that would exceed BAAQMD significance thresholds.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.2-2: Project construction would generate fugitive dust that could result in a localized increase in particulate matter.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.2-3: Project construction would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.2-4: Project operational emissions from new development would not result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	LTS	- LTS	- LTS	- LTS	= LTS	S/U	+ LTS
5.2-5: Project operation of development would generate emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.2-6: Proposed Project operations would not result in local concentrations of carbon monoxide that would exceed State and federal standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS

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S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact

\- Lesser impact than that of the proposed project.
= Same (or similar) impact as that of the proposed project.
=/+ Same or greater impact than that of the proposed project

TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.2 Air Quality (cont.)							
5.2-7: Project operation of development would not create objectionable odors that would affect a substantial number of people.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.2-8: Project operation of development could conflict with or obstruct implementation of the applicable air quality plan.	S/M	- S/M	- S/M	- S/M	= S/M	S/U	+ S/M
5.2-9: The Project would not result in emissions of NOx, PM, or ROGs that are cumulatively considerable.	LTS	- LTS	- LTS	- LTS	= LTS	S/U	+ LTS
5.2-10: The Project could considerably contribute to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.3 Biological Resources							
5.3-1: Project activities could result in adverse effects on special-status and migratory birds.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.3-2: Project activities could result in adverse effects on special-status bats.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.3-3: Project activities could result in adverse effects on the San Francisco dusky-footed woodrat.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.3-4: Project construction activities could result in adverse effects on special-status plant species.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.3-5: Project activities would not result in significant effects on federal and state protected species covered by the Stanford Habitat Conservation Plan.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.3-6: Project activities could result in significant effects on steelhead.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.3-7: Project activities could result in substantial loss or degradation of riparian habitat.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.3-8: Project activities could result in the loss of native oak woodland habitat.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.3-9: Project construction activities could result in substantial adverse effects on jurisdictional waters and wetlands.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.3 Biological Resources (cont.)							
5.3-10: Implementation of the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.3-11: Implementation of the project could conflict with local Santa Clara County tree preservation ordinance.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.3-12: Implementation of the Project could cumulatively cause an adverse impact to biological resources.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.4 Cultural Resources							
5.4-1: Project development could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.	S/U	- S/U	- S/U	- S/U	- LTS	+ S/U	+ S/U
5.4-2: Project development could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.4-3: Project development could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.4-4: Project Development could disturb human remains, including those interred outside of dedicated cemeteries.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.4-5: Project development could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.4-6: Project development, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments, could contribute considerably to significant cumulative adverse changes in the significance of historical resources.	S/U	- S/U	- S/U	- S/U	- LTS	+ S/U	+ S/U

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.4 Cultural Resources (cont.)							
5.4-7: Ground-disturbing activities undertaken as part of the Project could cumulatively cause a substantial adverse change in the significance of an archaeological resource, paleontological resource, or tribal cultural resource, or disturb human remains during construction.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.5 Energy Conservation							
5.5-1: Project development would not result in the use of fuel, water, or energy in wasteful or inefficient manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.5-2: Project development, in conjunction with other cumulative development and growth, would not contribute to cumulative increases in demand for energy which would result in the use of large amounts of fuel, water, or energy, or use these in wasteful manner, or create demand on local and regional energy supplies that would require additional energy generation or transmission capacity, the construction of which would result in a substantial adverse environmental effect.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.6 Geology and Soils							
5.6-1: Project construction would not result in substantial soil erosion or loss of topsoil.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-2: Project development would not expose people or structures to substantial adverse effects from ground shaking.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-3: Project development would not expose people or structures to potential substantial adverse effects associated with liquefaction or lateral spreading, including the risk of loss, injury or death, in the event of a major earthquake on one of the regional active faults.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-4: Project development would not expose people or structures to potential substantial adverse effects associated with landslides, including the risk of loss, injury or death, in the event of a major earthquake on one of the other regional active faults.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.6 Geology and Soils (cont.)							
5.6-5: Project development would not result in substantial soil erosion or the loss of topsoil.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-6: Project development would not result in substantial adverse effects from on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse as a result of being located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project development.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-7: Development under the proposed Project would not be located on expansive soils that would create substantial risks to life or property.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.6-8: Development facilitated by the proposed Project, combined with past, present, and reasonably foreseeable probable projects, would not result in substantial adverse cumulative impacts to geology, soils, or seismic hazards.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.7 Greenhouse Gas Emissions							
5.7-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a cumulatively considerable contribution to global climate change.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.7-2: The Project could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.8 Hazards and Hazardous Materials							
5.8-1: Under the proposed Project, demolition of existing structures that contain hazardous building materials would not create a significant hazard associated with exposure of workers, the public, or the environment from the transport, use, or disposal of these hazardous materials and waste.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.8-2: Under the proposed Project, construction projects could disturb soil and groundwater contaminated by historical hazardous material use, which could present risks the health of construction workers, the public, and/or the environment.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.8 Hazards and Hazardous Materials (cont.)							
5.8-3: Improper handling or storage of hazardous materials during Project construction activities could result in spills would not significantly increase public health and/or safety risks to future residents, maintenance workers, visitors, and the public and environment in the area surrounding the spill.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.8-4: Operation of uses developed under the proposed Project that could involve the transportation, use, storage and disposal of hazardous materials, would not present significant public health and/or safety risks to residents, visitors, and the surrounding area.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.8-5: Hazardous materials used at facilities operating under the Project could potentially be spilled through upset or accidental conditions, but would not significantly increase public health and/or safety risks to future residents, workers, visitors, and the surrounding area.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.8-6: New development under the proposed Project could potentially be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thus, could result in a safety hazard to the public or environment.	S/M	- S/M	- S/M	- S/M	= S/M	+ LTS	+ LTS
5.8-7: Implementation of the Project could result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school, but would not create a significant hazard to those facilities.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.8-8: Development facilitated by the Project would not substantially impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.8-9: Development under the Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.8-10: Hazards at the Project site, in combination with past, present, and future projects could potentially contribute to cumulative hazards.	S/M	- S/M	- S/M	- S/M	= S/M	= S/M	= S/M
5.8-11: The Project, in combination with past, present, and future projects would not substantially impair implementation or physically interfere with emergency response or evacuation plans.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS

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S/M Significant impact, but mitigable to a less than significant level
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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.8 Hazards and Hazardous Materials (cont.)							
5.8-12: The Project, in combination with past, present, and future projects would not substantially contribute cumulatively to exposure to wildland fires.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.9 Hydrology and Water Quality							
5.9-1: Project construction could violate water quality requirements or waste discharge requirements, or otherwise degrade water quality.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.9-2: Project construction could include temporary dewatering, but would not substantially deplete groundwater supplies or cause a lowering of the water table.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.9-3: Operation of the Project would not violate water quality requirements or waste discharge requirements, or otherwise substantially degrade water quality.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.9-4: Project operation could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.9-5: Project development would potentially alter the drainage pattern of the Project site, but would not result in substantial erosion or siltation on or off the site.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.9-6: Project development would create runoff, but would not exceed the capacity of existing or planned stormwater infrastructure, or result in flooding on- or off-site.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS
5.9-7: The Project, in combination with past, present, and future projects could potentially contribute to surface and groundwater quality impacts.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.9-8: The Project, in combination with past, present, and future projects could potentially contribute to depletion in groundwater supplies or interfere with groundwater recharge.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.9-9: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative surface hydrology impacts.	LTS	- LTS	- LTS	- LTS	=/+ LTS	+ LTS	+ LTS

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LTS Less than significant impact

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.10 Land Use and Planning							
5.10-1: The Project could conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	- LTS	- LTS	- LTS	- LTS	+ LTS	+ LTS
5.10-2: The Project, in combination with past, present, and future projects could potentially contribute to cumulative land use impacts.	LTS	- LTS	- LTS	- LTS	- LTS	+ LTS	+ LTS
5.11 Noise and Vibration							
5.11-1: The Project could expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.11-2: Project construction could result in a substantial temporary or periodic increase in ambient noise levels in the Project site vicinity.	S/U	- S/U	- S/U	- S/U	=/+ S/U	+ S/U	+ S/U
5.11-3: Project construction could result in temporary exposure of persons to or generation of, excessive groundborne vibration or groundborne noise levels in the Project site vicinity.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.11-4: The Project could increase long-term noise levels in the Project vicinity to levels in excess of applicable noise standards.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.11-5: Project traffic would not substantially increase traffic noise levels in the vicinity of the Project site.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.11-6 Project construction noise, in combination with past, present, existing, approved, pending and reasonably foreseeable future developments could contribute considerably to cumulative noise impacts.	S/U	- S/U	- S/U	- S/U	=/+ S/U	+ S/U	+ S/U
5.11-7: Project traffic in combination with traffic from cumulative development would not contribute considerably to cumulative noise impacts.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.12 Population and Housing							
5.12-1: The proposed Project would not directly induce substantial population growth by proposing new homes or businesses, and indirectly through the extension of infrastructure.	LTS	- LTS	- LTS	- LTS	= LTS	- LTS	- LTS

S/U Significant and unavoidable impact
S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact
- Lesser impact than that of the proposed project.
= Same (or similar) impact as that of the proposed project.
=/+ Same or greater impact than that of the proposed project

TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.12 Population and Housing (cont.)							
5.12-2: The Project, in combination with past, present, and future projects would not result in substantial adverse cumulative population and housing impacts.	LTS	- LTS	- LTS	- LTS	= LTS	- LTS	- LTS
5.13 Public Services							
5.13-1: Project construction could increase demand for fire protection, emergency medical service and police protection services but would not result in an adverse physical impact from the construction of additional fire protection, emergency medical, or police protection facilities in order to maintain acceptable performance standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.13-2: Operation of uses under the Project would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.13-3: Operation of development under the proposed Project would increase demand for police protection services.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.13-4: The proposed Project would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.13-5: Implementation of the proposed Project in combination with past, present, and reasonably foreseeable projects, would increase demand for fire protection and emergency medical services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.13-6: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase demand for police protection services, but would not result in an adverse physical impact from the construction of additional facilities in order to maintain acceptable performance standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS

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S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.13 Public Services (cont.)							
5.13-7: Development of the proposed Project in combination with past, present, and reasonably foreseeable projects would increase enrollment in public schools but would not result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable enrollment standards.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.14 Recreation							
5.14-1: The Project would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	LTS	- LTS	- LTS	- LTS	= LTS	S/M	S/M
5.14-2: The construction of recreational facilities under the proposed Project would cause physical effects on the environment.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.14-3: The Project in combination with past, present, and reasonably foreseeable future projects would not increase use of existing neighborhood and regional parks and other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	LTS	- LTS	- LTS	- LTS	= LTS	S/M	S/M
5.15 Transportation and Traffic							
5.15-1: The proposed Project would generate construction traffic that would cause a substantial reduction in mobility and in access to land uses.	S/M	- S/M	- S/M	- S/M	= S/M	+ S/M	+ S/M
5.15-2: Implementation of the proposed Project could increase traffic volumes at area intersections, creating adverse impacts under 2018 Baseline with Project conditions.	S/U	- LTS	- S/U	- S/U	= S/U	+ S/U	+ S/U
5.15-3: Implementation of the proposed Project could increase traffic volumes on area freeways, creating adverse impacts under 2018 Baseline with Project conditions.	S/U	- LTS	- S/U	- S/U	= S/U	+ S/U	+ S/U
5.15-4: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.15-5: Implementation of the proposed Project would not substantially increase intrusion by traffic in nearby neighborhoods.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS

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S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.15 Transportation and Traffic (cont.)							
5.15-6: Implementation of the proposed Project would not substantially increase hazards due to a design feature or incompatible uses.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS	= LTS
5.15-7: Implementation of the proposed Project would not result in inadequate emergency access.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.15-8: Implementation of the proposed Project would not conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.15-9: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes at area intersections, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.	S/U	- LTS	- S/U	- S/U	= S/U	+ S/U	+ S/U
5.15-10: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future projects, could increase traffic volumes on area freeways, contributing considerably to significant adverse impacts under 2035 Cumulative with Project conditions.	S/U	- LTS	- S/U	- S/U	= S/U	+ S/U	+ S/U
5.15-11: Implementation of the proposed Project, in combination with other past, present, and reasonably foreseeable future, projects, would not conflict with adopted policies, plans, or programs regarding public transit, or otherwise decrease the performance or safety of such facilities.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.15-12: The Project would be located within one-half mile of an existing major transit stop or an existing stop along a high quality transit corridor.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.15-13: The proposed Project VMT would not exceed the numeric thresholds recommended by OPR.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16 Utilities and Service Systems							
5.16-1: The Project would result in the expansion of existing on-campus infrastructure, the construction of which could cause significant environmental effects.	S/M	- S/M	- S/M	- S/M	=/+ S/M	+ S/M	+ S/M
5.16-2: Project development would increase the demand for water, however it would be adequately supplied from existing entitlements and resources.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS

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S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact

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TABLE 7-4 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

Impact	Proposed Project	No Project Alternative		Reduced Project	Historic Preservation	Additional Housing Alternative A	Additional Housing Alternative B
		No Project/No Development	No Project / Individual Use Permits				
5.16 Utilities and Service Systems (cont.)							
5.16-3: The Project would increase demand for wastewater treatment, but would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-4: The Project would discharge additional flows to the municipal sewer and drainage system, but not to an extent which would exceed the facilities' capacity in light of existing commitments.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-5: Project construction would result in an increased generation of solid waste, but would not exceed permitted capacity to accommodate the Project's solid waste disposal needs or conflict with federal, State, and local statutes and regulations related to solid waste.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-6: Operation of the Project would comply with federal, state, and local statutes and regulations related to solid waste and would be adequately served by existing landfills with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-7: Implementation of the proposed Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for water supplies.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-8: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for wastewater treatment.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.16-9: Implementation of the Project, in combination with past, present, and future projects would contribute to cumulative increases in demand for landfill space.	LTS	- LTS	- LTS	- LTS	= LTS	+ LTS	+ LTS
5.17 Environmental Consequences of Stanford Providing Off-campus Housing Under Proposed Project							
Impact 5.17-1: Under the proposed Project, the construction and/or operation of off-site housing would result in off-site environmental impacts.	S/U	- LTS	- LTS	- S/U	= S/U	=/+ S/U	=/+ S/U

SOURCE: Environmental Science Associates

S/U Significant and unavoidable impact
S/M Significant impact, but mitigable to a less than significant level
LTS Less than significant impact

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7.6 Environmentally Superior Alternative

Section 15126.6(e)(2) of the CEQA Guidelines requires the identification of an environmentally superior alternative to the proposed project. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

7.6.1 No Project/No Development Alternative

From the alternatives evaluated in this EIR, the environmentally superior alternative would be the No Project/No Development Alternative. The No Project /No Development Alternative would result in less new construction and new development than the proposed Project or the other alternatives. Consequently, the No Project/No Development Alternative's impacts related to construction and operation of new development would also be less than the proposed Project or the other alternatives.

The No Project/No Development Alternative would eliminate four of the significant and unavoidable Project and/or cumulative transportation and traffic impacts: Impact 5.15-2 (increase in traffic at area intersections under 2018 Baseline with Project conditions); Impact 5.15-3 (increase in traffic on area freeways under 2018 Baseline with Project conditions); 5.15-9 (increase in traffic at area intersections under 2035 Cumulative with Project conditions); and 5.15-10 (increase in traffic on area freeways under 2035 Cumulative with Project conditions).

With less construction and development, the No Project/No Development Alternative would also reduce the potential for, but not eliminate, the two significant and unavoidable Project and/or cumulative construction noise impacts: Impact 5.11-2 (Project increase in temporary or periodic increase in ambient noise levels), and Impact 5.11-7 (cumulative increase in temporary or periodic increase in ambient noise levels).

On the other hand, given that all new development under this alternative would require a commensurate reduction in existing academic and academic support space and housing levels, there could be the potential under this alternative for more remodeling and/or demolishing of historic buildings on the Project site compared to the proposed Project; and therefore, there is the potential for this alternative to increase the potential for historic buildings to be significantly impacted compared to the proposed Project effects identified in Impact 5.4-1 (Project substantial adverse change in the significance of a historical resource), and Impact 5.4-6 (cumulative substantial adverse change in the significance of a historical resource). This alternative could, however, be combined with the Historic Preservation Alternative.

In any case, this alternative would fail to achieve the primary Project purpose and most of the basic Project objectives. This alternative would severely constrain Stanford's ability to grow and develop the Project site in a manner that reflects the growth assumptions in the approved Sustainable Development Study. This alternative also would not accomplish the following more specific project objectives: enable Stanford to further its academic mission, provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond

quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities; enable Stanford to meet its needs to accommodate increasing enrollment and balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2018 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique EV Graduate Student Residences Project; enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents; and support existing and new academic, academic support and housing uses by authorizing new and improved parking facilities, roadway, utility and infrastructure improvements, child care centers, facilities designed to promote vehicle trip reduction, and temporary trailers for construction surge space.

7.6.2 Reduced Project Alternative

Of the remaining alternatives that are not the no project alternative: (Reduced Project Alternative, Historic Preservation Alternative, Additional Housing Alternative A, and Additional Housing Alternative B), the Reduced Project Alternative is considered the environmentally superior alternative. The Reduced Project Alternative would result in approximately 43 percent less academic and academic support development, and approximately 43 percent fewer housing units, than the proposed Project, and 43 percent less population.

The Reduced Project Alternative would reduce the severity of four of the significant and unavoidable Project and/or cumulative transportation and traffic impacts. Specifically, it would reduce the number of intersections significantly impacted under Cumulative Conditions in 2035 in Impact 5.15-9 (17 intersections impacted under this alternative versus 22 intersections impacted under the Project), and reduce the number of freeway segments significantly impacted in 2018 and/or under Cumulative 2035 conditions identified in Impacts 5.15-3 and 5.15-10 (5 freeway segments impacted under this alternative versus 12 freeway segments impacted under the Project).

With less construction and development, the Reduced Project Alternative would also serve to reduce the potential for, but not eliminate, the two significant and unavoidable Project and/or historic resource impacts (Impact 5.4-1 and Impact 5.4-6); and would also reduce the potential for, but not eliminate, the two significant and unavoidable Project and/or cumulative construction noise impacts (Impacts 5.11-2 and Impact 5.11-7).

However, this alternative would fail to fully achieve certain Project objectives, including, but not limited to, the objectives to provide state-of-the-art facilities for research and learning, encourage interdisciplinary collaboration, maintain flexibility to respond quickly to changes in educational or research technologies, and provide venues for athletic and cultural experiences by authorizing new and expanded academic and academic support facilities at a growth rate from 2028 through 2035 that is consistent with Stanford's historic annual growth rate for academic and academic support facilities; the objective of meeting its needs to accommodate increasing enrollment and

balance academic and academic support space growth with student housing growth by authorizing new and expanded student housing units/beds at a growth rate from 2028 through 2035 that is consistent with Stanford's historic annual growth rate for student housing, not including the unique EV Graduate Student Residences Project; and the objective of enabling enable Stanford to foster collaboration and learning, and recruit and retain world class scholars and faculty by authorizing 550 transit-oriented high density housing units that can be occupied by faculty, staff, postdoctoral scholars and medical residents.

7.6.3 Additional Housing Alternative A

Additional Housing Alternative A would result in the same academic and academic support development but an approximate 81 percent increase in on-campus housing unit/beds over the proposed Project (i.e., increase of 5,699 versus under this alternative versus 3,150 increase under the proposed Project), and a 99 percent increase in on-campus residential population over the proposed Project (i.e., an increase of 12,573 under this alternative versus 6,326 under the proposed Project).

Additional Housing Alternative A would result in three significant and unavoidable air quality impacts [operational emissions of criteria air pollutants (PM_{10}); and relatedly, conflict with the 2017 BAAQMD Clean Air Plan; and cumulatively considerable increases in PM_{10}], related to an additional on-campus residential population and associated increase in daily vehicle trips.

This alternative would also generally add peak-hour vehicle trips to, and further increase congestion at, the study intersections located closest to the campus under 2018 Baseline with Additional Housing Alternative A Conditions, and under Cumulative Conditions in 2035. As a result, this alternative would make a cumulatively considerable contribution to significant impacts at two additional study intersections in Cumulative Conditions in 2035. This alternative would also result in significant impacts at two additional freeway segments under 2018 Baseline with Additional Housing Alternative A Conditions, and result in significant impacts at three additional freeway segments under Cumulative Conditions in 2035.

The increase in campus residents anticipated to occur under the Additional Housing Alternative A would result in a further increase in off-campus public park visits resulting in a significant but mitigable impact, and contribution to cumulative impact, to turfs at the College Terrace parks, Heritage Park, and Stanford Hills Park, that would not occur under the proposed Project.

Since Additional Housing Alternative A would result in more on-campus construction, including along the campus perimeter, than the proposed Project, it would have the potential to exacerbate the significant and unavoidable impact associated with construction noise levels in excess of established noise standards (if construction activities were to occur during prohibited hours); and exacerbate the significant and unavoidable impact associated with cumulative construction noise.

Given that Additional Housing Alternative A would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on redevelopment and infill sites, it would have an incrementally greater potential than the proposed Project to result in significant and unavoidable direct or indirect impacts to historic resources.

7.6.4 Additional Housing Alternative B

Additional Housing Alternative B would result in the same academic and academic support development but an approximate 40 percent increase in on-campus housing unit/beds over the proposed Project (i.e., increase of 4,425 versus under this alternative versus 3,150 increase under the proposed Project), and a 49 percent increase in on-campus residential population over the proposed Project (i.e., an increase of 9,451 under this alternative versus 6,326 under the proposed Project).

This alternative would also generally add peak-hour vehicle trips to, and further increase congestion at, the study intersections located closest to the campus under 2018 Baseline with Additional Housing Alternative B Conditions, and under Cumulative Conditions in 2035, although would not result in any new significant and unavoidable transportation impacts.

The increase in campus residents anticipated to occur under the Additional Housing Alternative B would result in a further increase in off-campus public park visits resulting in a significant but mitigable impact, and contribution to cumulative impact, to turfs at College Terrace parks, that would not occur under the proposed Project.

Since Additional Housing Alternative B would result in more on-campus construction, including along the campus perimeter, than the proposed Project, it would have the potential to exacerbate the significant and unavoidable impact associated with construction noise levels in excess of established noise standards (if construction activities were to occur during prohibited hours); and exacerbate the significant and unavoidable impact associated with cumulative construction noise.

Given that Additional Housing Alternative B would involve more on-campus housing development and infrastructure than the proposed 2018 General Use Permit, including on redevelopment and infill sites, it would have an incrementally greater potential than the proposed Project to result in significant and unavoidable direct or indirect impacts to historic resources.

7.7 References

City of Palo Alto, *Comprehensive Plan 2030*, adopted November 13, 2017a.

City of Palo Alto, *Comprehensive Plan Update Final EIR for the City of Palo Alto*, certified November 13, 2017b.

City of Menlo Park, *ConnectMenlo*, adopted November 29, 2016a.

City of Menlo Park, *ConnectMenlo Final EIR*, certified on November 29, 2016b.

City of Mountain View, 2030 General Plan, adopted July 10, 2012a.

City of Mountain View, 2030 General Plan Final EIR, certified on July 10, 2012b.

PAUSD, *Residential Research Summary Report, Winter 2018*, DecisionInsite, submitted January 3, 2018a.

PAUSD, *Analysis of Enrollment Projections, Fall 2018*, DecisionInsite, submitted January 10, 2018b.

Fehr and Peers, *Stanford 2018 General Use Permit: Reduced Project Alternative Intersection LOS Analysis*, October 2, 2017.

Governor's Office of Planning and Research (OPR), *Proposed Updates to the CEQA Guidelines*, November 2017.

OPR, *Technical Advisory on Evaluating Transportation Impacts in CEQA,* April 2018.

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CHAPTER 8
Special Considerations

8.1 Stanford Funding of Off-site Bicycle Improvements

8.1.1 Introduction

Stanford is proposing to fund certain off-site bicycle facility improvements in several communities surrounding Stanford, including the cities of East Palo Alto, Palo Alto and Menlo Park; and unincorporated San Mateo County. As discussed further below, because Stanford would partially fund, but not build and operate these off-site improvements, they are not proposed specifically as part of the proposed 2018 General Use Permit; however these improvements would work in connection with Stanford's trip reduction program and would assist Stanford in achieving the Stanford Community Plan's No Net New Commute Trips standard over the life of the proposed 2018 General Use Permit.[1]

The proposed off-site bicycle facility improvements are intended to reduce the potential for local vehicle congestion effects by encouraging use of alternative modes of transportation, and thereby reducing Stanford commuter and other local vehicular trips that contribute to local congestion. The reductions in the other local trips component are proposed to be credited toward Stanford's No Net New Commute Trips standard on an annual basis commencing upon completion of each of the improvement projects. Under this proposal, Stanford would only receive credits toward the No Net New Commute Trips goal if and once the improvements are approved and constructed. As specified by the Stanford Community Plan, the methodology for determining trip credits for these improvements would be subject to the County for review and approval.

It should be noted that bicycle facilities, if and when implemented, would directly benefit the communities in which they are located regardless of whether trip reduction credits would be needed to achieve No Net New Commute Trips standard.

8.1.2 Relationship to Proposed Project

The proposed funding of the off-site bicycle facility improvements would serve to facilitate the implementation of these facilities. However, these off-site improvements are not themselves part of the Project, and are not within the scope of this EIR (see also discussion of Environmental

[1] Stanford Community Plan Policy C-8 indicates the County recognizes participation by Stanford in off-campus trip reduction efforts and the County credits reduced trips towards Stanford's attainment of the No Net New Commute Trips standard.

Considerations, below) given that 1) Stanford's role would be limited to the funding of these off-site improvements, 2) the off-site improvements would not be approved as part of the County approval of the proposed 2018 General Use Permit; 3) the off-site improvements may be subject to further design refinement; 4) the off-site improvements would be considered for approval by the jurisdictional agencies in which these off-site improvements are located; and 5) if approved, the off-site improvements would be constructed and maintained by those applicable agencies.

8.1.3 Description of Proposed Off-Site Bicycle Facility Improvements

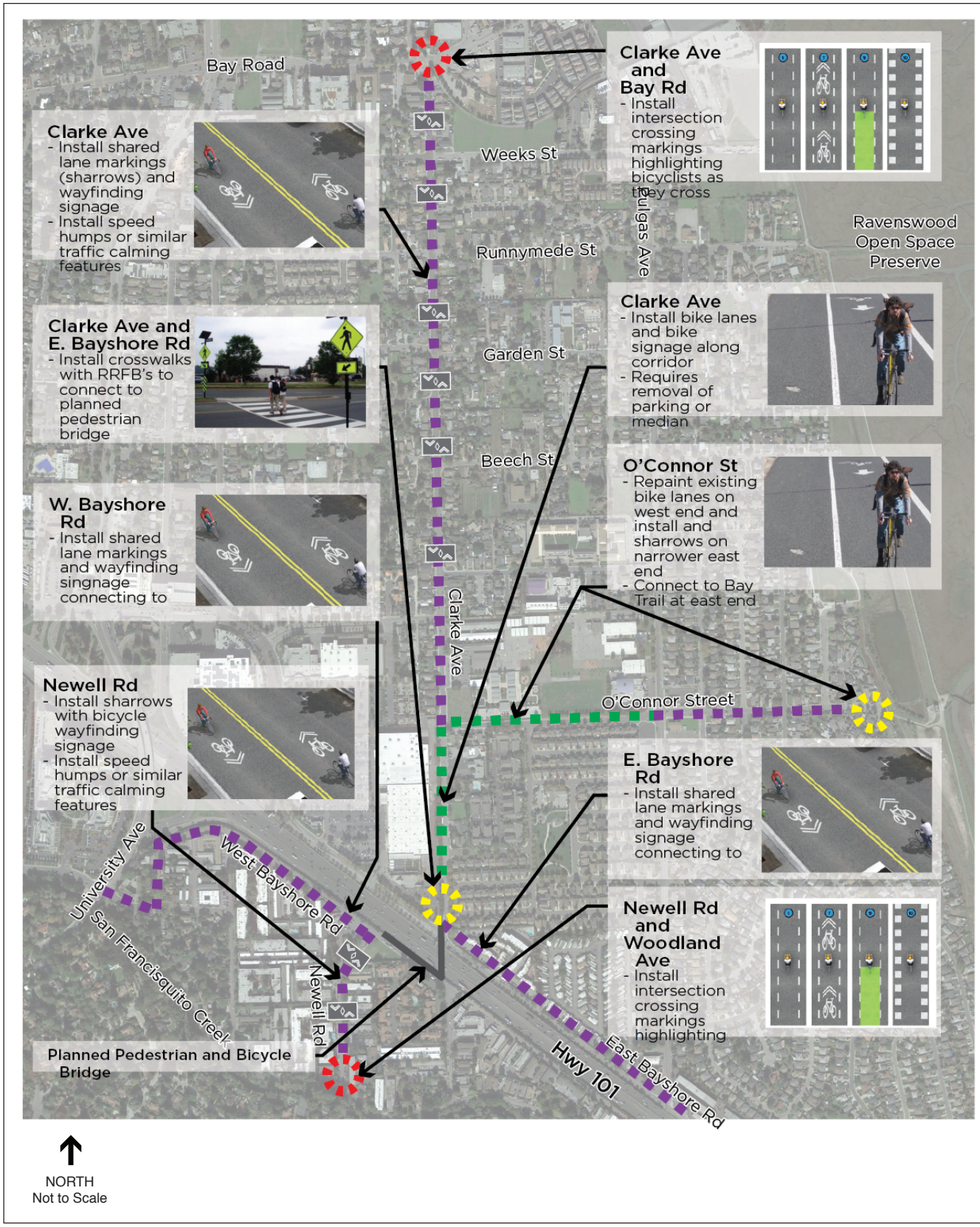
Stanford proposes funding toward off-site bicycle infrastructure improvements in the cities of East Palo Alto, Palo Alto, Menlo Park and unincorporated San Mateo County that would serve these communities and provide new connections to the Stanford campus.

The proposed off-site bicycle improvements would address gaps in the bike networks between existing or proposed infrastructure projects. Access to local destinations through connected bicycle facilities, such as shared-use paths, buffered bicycle lanes, bike boulevards, and intersection treatments, would serve to increase bicycle use as a mobility choice. Stanford consulted with transportation staff in August 2017 from each of these jurisdictions to receive their preliminary input and recommendations related to these off-site improvements (Alta, 2017). It is expected that these off-site improvements would be subject to further refinement and environmental evaluation by the applicable jurisdictional agencies as part of their design, review, and approval processes for these projects.

Proposed Off-site Bicycle Improvements - East Palo Alto: Clarke Avenue-Newell Road Connections

Stanford would fund the design and implementation of improved connections to the planned bicycle and pedestrian overcrossing of US 101 in East Palo Alto between Clarke Avenue and Newell Road. The Clarke-Newell bicycle and pedestrian overcrossing is currently approved, with construction anticipated to being in fall 2017. While this overcrossing would remove a key barrier to bicycle travel and provide a critical link in the bicycle network, gaps would remain in the bicycle network on the local roadways connecting to the new bridge. Stanford proposes to fund improvements to support bicycle travel on both sides of the new overcrossing. The improvements would include, subject to local agency approval, the following (see **Figure 8-1**):

- A bike boulevard on Clarke Avenue between Bay Road and O'Connor Street, including speed humps, chicanes, or other similar traffic calming treatments;
- Bike lanes on Clarke Avenue between O'Connor Street and the landing of the US 101 bicycle/pedestrian bridge;
- Bike lanes and sharrows along O'Connor Street from Clarke Avenue to the San Francisco Bay Trail;
- Intersection improvements at Clarke Avenue and Bay Street, including markings indicating locations for bicyclists in the intersection;



SOURCE: Alta Planning and Design

Stanford 2018 General Use Permit . 160531

Figure 8-1

Identified Off-site Bicycle Improvements - East Palo Alto: Clarke Avenue-Newell Road Connections to Bicycle/Pedestrian Overcrossing

- Flashing beacon or similar improvement at the landing of the US 101 bicycle/pedestrian bridge;
- A Class III bike route on Newell Road from West Bayshore Avenue to the San Francisquito Creek Bridge at Woodland Drive, including road markings (sharrows) and signage;
- Intersection improvements at Newell Road and Woodland Avenue, connecting bicyclists to the bridge of San Francisquito Creek;
- A Class III bike route on West Bayshore Road, Capitol Avenue, and Scofield Road to University Avenue, providing connections to bike lanes on University Avenue in Palo Alto; and
- A Class III connection along East Bayshore Road from Clarke Avenue to Pulgas Avenue, providing a secondary connection for bicyclists accessing the overcrossing.

Stanford would contribute $450,000 in funding toward the design and implementation of bicycle connections to the bridge, which is the full estimated cost of these improvements.

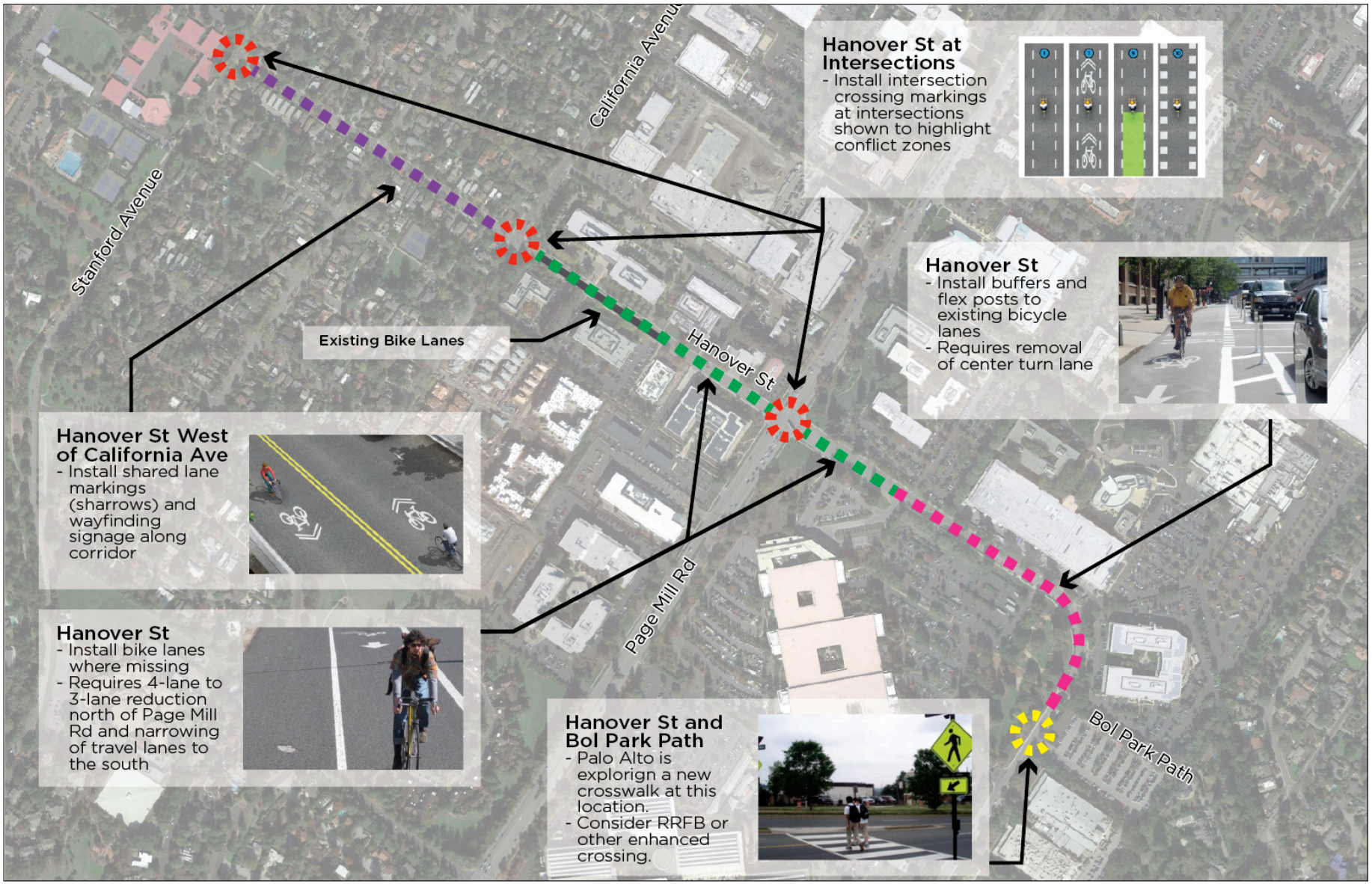
Proposed Off-site Bicycle Improvements - Palo Alto: Hanover Street/ Bol Park

Stanford would fund bicycle infrastructure improvements in Palo Alto to connect existing bicycle facilities at Bol Park and the Stanford Perimeter Trail. The improvements would be installed along Hanover Street, which would provide a continuous route through southern Palo Alto neighborhoods and the Stanford Research Park to the Stanford campus.

The Bol Park Path is a heavily used bicycling and walking route that serves travelers to Escondido Elementary School, Terman Middle School, Gunn High School, the Stanford Research Park, and the Stanford campus. However, after exiting the path on Hanover Street, there is a non-ideal connection through the Stanford Research Park to reach Escondido Elementary School and the Stanford campus, and a crossing of Page Mill Road.

Stanford would fund improvements on Hanover Street to connect the Bol Park Path with the Stanford Perimeter Trail through either on-street or off-street bicycle facilities. Further, Stanford would fund improved lighting and landscaping of Bol Park, which would facilitate the multi-use path in the commute hours during the shorter daylight hours. The improvements would include, subject to local agency approval, the following (see **Figure 8-2**):

- Bike lanes along Hanover Street, continuous from the Bol Park Path to the Page Mill Road intersection, potentially requiring removal of the center turn lane;
- Continuation of bike lanes through the Page Mill Road intersection using intersection treatments like green paint or similar;
- Continuous buffered bike lanes on Hanover Street from Page Mill Road to California Avenue, potentially removing one northbound traffic lane;
- Crossing improvements at California Avenue, indicating continuation of bicycle route along Hanover Street through the existing diverter; and
- Signage and sharrows along Hanover Street from California Avenue to Stanford Avenue.



NORTH
Not to Scale

SOURCE: Alta Planning and Design

Figure 8-2
Identified Off-site Bicycle Improvements - Palo Alto:
Hanover Street Connection from Bol Park Path to Stanford

These improvements would support Santa Clara County Roads and Airports and the City of Palo Alto's efforts to make improvements to the intersection of Page Mill Road and Hanover Street, and may need to be adapted to accommodate final design of the intersection.

Stanford would contribute up to $250,000 in funding towards the design and implementation of bicycle improvements in this corridor, which is the full estimated cost of these improvements.

Proposed Off-site Bicycle Improvements – Menlo Park: Oak Grove Avenue Connection

The City of Menlo Park is constructing buffered bike lanes and bike boulevards on Oak Grove Avenue, University Drive, and Crane Street as a pilot bicycle improvement. Stanford would fund an extension of the City of Menlo Park's project along Middle Avenue and San Mateo Drive to Sand Hill Road connections to create a bicycle commute route to the Stanford hospitals, shopping center and the campus.

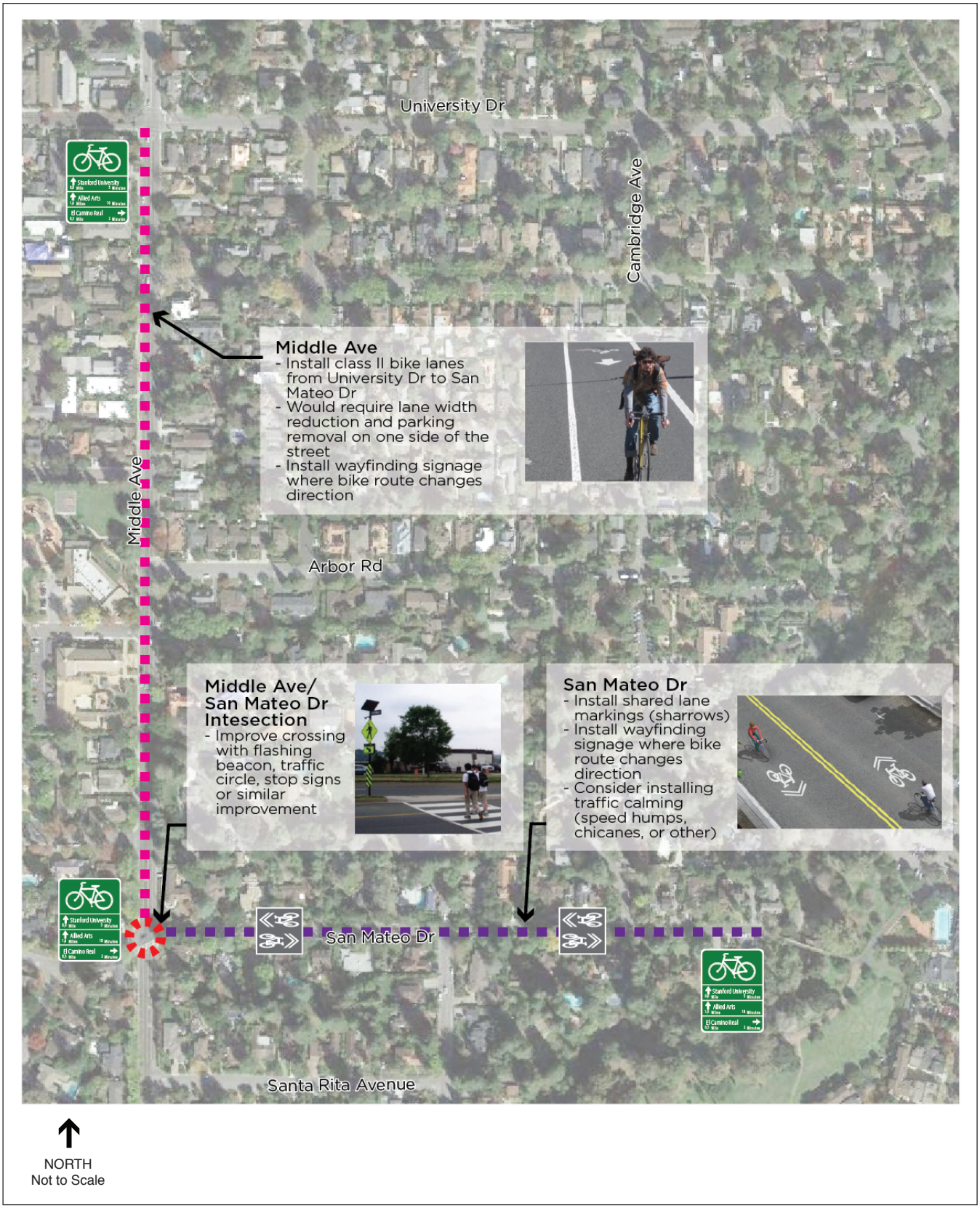
On the western side of Menlo Park (west of El Camino Real), there is an existing bike/pedestrian bridge over San Francisquito Creek from San Mateo Drive in Menlo Park to Durand Way in Palo Alto, but limited bicycle routes or wayfinding to the Stanford campus. The City of Menlo Park's Oak Grove University Crane Bicycle Improvement Project installed a bicycle facility that connects key destinations in the city including schools, the downtown and residential neighborhoods. The City's project includes buffered bike lanes on each side of the street on Oak Grove Avenue and University Drive, with a connecting bicycle route marked with sharrows on Crane Street, Santa Cruz Avenue, and Live Oak Avenue. While this City's project will improve connections within Menlo Park, it will not extend to the Stanford campus.

Stanford would fund additions to the City's bicycle improvement project to extend those improvements to the Stanford campus. The improvements would include, subject to local agency approval, the following (see **Figure 8-3**):

- Adding bike lanes on Middle Avenue from University Drive to San Mateo Drive;
- Adding Class III Bicycle boulevard improvements on San Mateo Drive from Middle Avenue to the bridge over San Francisquito Creek, including sharrows and speed humps, chicanes, or other similar traffic calming improvements;
- Improving the intersection of Middle Avenue and San Mateo Drive to include flashing beacons, a mini-roundabout, or other improvements to increase safety for bicyclists using the route; and
- Providing wayfinding along the entire route.

The improvements would connect to the new street connection that will be constructed at Durand Way as part of the Stanford University Medical Center Renewal Project, which will include new bicycle lanes.

Stanford would contribute up to $250,000 in funding towards the design and implementation of bicycle improvements in this corridor, which is the full estimated cost of these improvements.



SOURCE: Alta Planning and Design

Stanford 2018 General Use Permit . 160531

Figure 8-3
Identified Off-site Bicycle Improvements – Menlo Park: Connection to Oak Grove Avenue

Proposed Off-site Bicycle Improvements – Unincorporated San Mateo County: Santa Cruz Avenue – Alameda de Las Pulgas

Stanford would fund improvements identified in a study that San Mateo County recently has undertaken. In its Santa Cruz Avenue/Alameda de las Pulgas Corridor Improvement Study, San Mateo County is evaluating possible roadway configuration alternatives along Santa Cruz Avenue from Sand Hill Road to Alameda de las Pulgas and along Alameda de las Pulgas between Santa Cruz Avenue and Sharon Road, to determine what safety and connectivity improvements could be achieved for bicycles, pedestrians, and vehicles. The study is led by the County of San Mateo Public Works Department in collaboration with the City of Menlo Park. The County is currently conducting the technical analysis to identify feasible solutions on the corridor. As part of a short-term solution, the County recently installed sharrows.

There is a substantial gap in bike lanes in San Mateo County along Alameda de las Pulgas and Santa Cruz Avenue. Traffic volumes and high speeds create safety issues for cyclists.

Stanford would fund implementation of the County's identified solution to enhance mobility and safety. These improvements would help fill a gap in the network for bicyclists traveling from Menlo Park, Atherton, Woodside, and unincorporated San Mateo County. The improvements would include, subject to local agency approval, the following (see **Figure 8-4**):

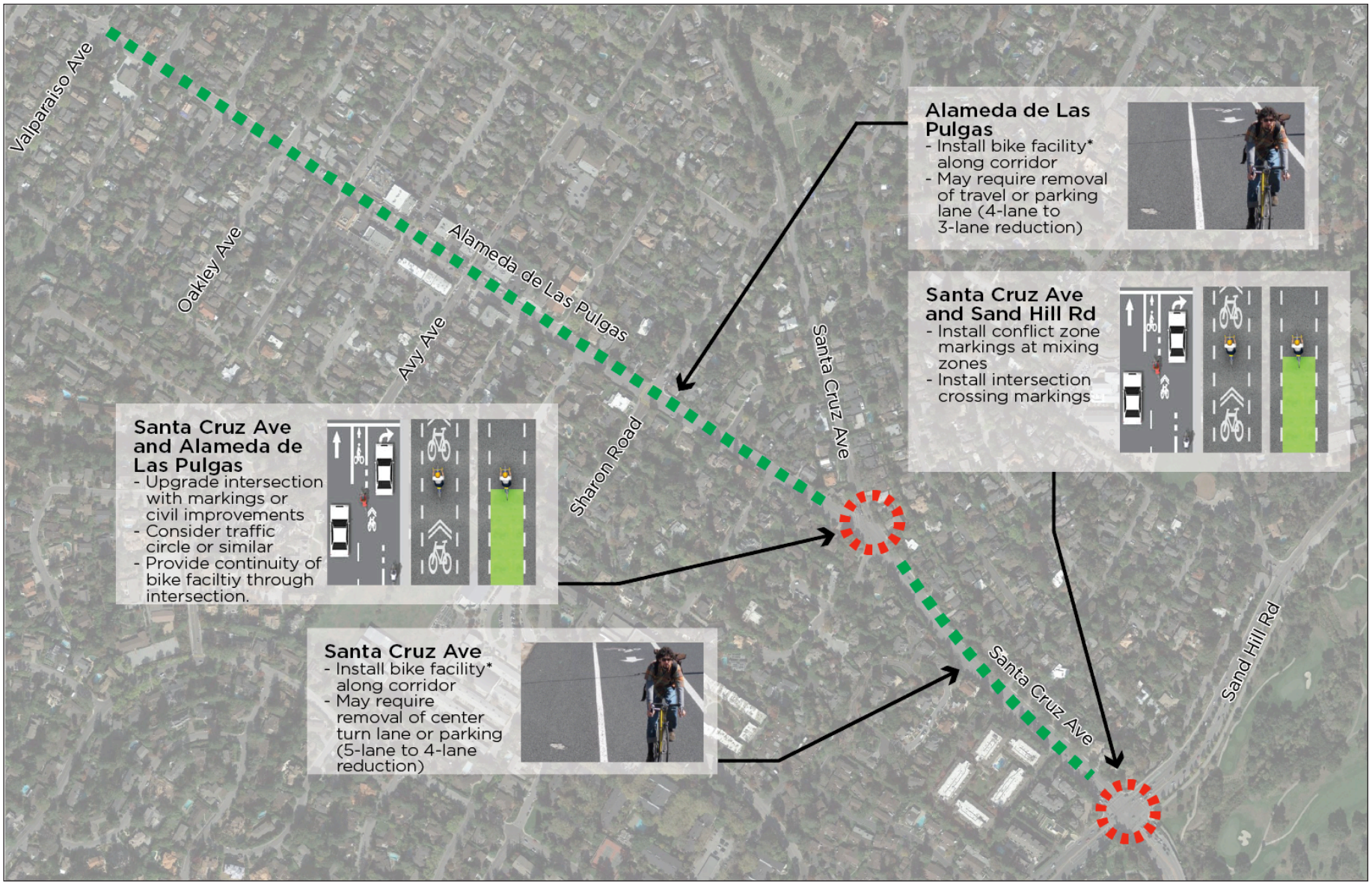
- A bike facility on Alameda de las Pulgas from Valparaiso Avenue to Santa Cruz Avenue, which may require removal of either a travel lane (4-lane to 3-lane road diet) or parking or some combination of each;
- An improved crossing on the east side of Santa Cruz Avenue and Alameda de Las Pulgas;
- A bike facility on Santa Cruz Avenue from Alameda de las Pulgas to Sand Hill Road, which may require removing the center turn lane or parking or combination of both (e.g., retain turn lanes at street intersections or major driveways and remove parking); and
- Potential crossing improvements, such as two-stage turn boxes or other similar improvements, at Sand Hill Road.

These improvements would be refined in Santa Cruz Avenue/Alameda de las Pulgas Corridor Improvement Study, but given traffic volumes and speeds, maximizing separation for bicyclists or reducing automobile speeds may be needed to achieve an adequate bicycle facility.

Stanford would contribute $250,000 in funding towards the implementation of bicycle improvements in this corridor, which is the full estimated cost of these improvements.

8.1.4 Environmental Considerations

As discussed above, the proposed off-site bicycle facility improvements are intended to reduce the potential for local vehicle congestion effects by encouraging use of alternative modes of transportation, thereby reducing Stanford commuter and other local vehicular trips that contribute to local congestion. However, it is expected the construction of these off-site improvements would result in short-term construction-related environmental effects. The implementation of



NORTH
Not to Scale

SOURCE: Alta Planning and Design

Stanford 2018 General Use Permit . 160531

Figure 8-4
Identified Off-site Bicycle Improvements – Unincorporated San Mateo County:
Alameda de Las Pulgas / Santa Cruz Avenue Gap Closure

these off-site improvements would also have other potential for long-term environmental consequences, including localized changes in vehicular flow, circulation and access to adjacent land uses associated with the addition of bike lanes and removal of vehicular travel lanes; removal of on-street parking; potential incremental changes in roadside noise levels experienced at adjacent land uses from realigned vehicular travel lanes, and effects on visual resources.

All of these proposed funded improvements projects would be required to comply with CEQA prior to consideration of approval by the jurisdictional agencies in which these off-site improvements are located.

8.2 References

Alta Planning + Design, Fehr and Peers, *Bicycle Improvement Project Meetings*, August 14, 2017.

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