ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date February 1, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Chris Sanchez; Brian Schuster; Paul Mitchell - ESA

subject Peer Review of Air Quality Technical Report for the Stanford University 2018 General Use Permit

At the County's request, the following are ESA's peer review comments on the *Stanford 2018 General Use Permit: Air Quality Technical Report* (AQTR), dated November 9, 2016, prepared by Ramboll Environ for Stanford. The AQTR contains a comprehensive analysis of the University's criteria air pollutant (CAP) and Toxic Air Contaminant (TAC) emissions within the General Use Permit study area and considers a variety of sources and future improvements to the transit fleet.

Given the task of peer reviewing the document, ESA has focused its efforts in the peer review process to key areas of analysis and methodology relative to the assessment of air quality and health risk impacts in the CEQA process, as well as to perform a general spot check of underlying tables, calculations and assumptions contained in the AQTR. The ultimate goal of the peer review is to help ensure that the information contained in the AQTR will meet accepted standards for inclusion in a legally adequate and defensible document under CEQA. These comments are presented generally in chronological order as found within the document, not according to order of significance.

Chapter 1: General

Emission Inventory Years

1. As directed by the County, for purposes of this EIR, the near-term baseline will be 2018 (the year the proposed 2018 General Use Permit will be initiated), and this baseline will include all development under the 2000 General Use Permit expected to be built and occupied by the approval of the 2018 General Use Permit, along with other cumulative development expected to occur by that date. It is our understanding that Stanford has directed Ramboll Environ to update its AQTR as needed to ensure its 2018 baseline correlates with these assumptions, and that a revised AQTR technical report will be forthcoming.

2. The AQTR includes analysis years of 2014 and 2015. While having analysis years of 2014 and 2015 lends historical perspective to the University's progress toward reducing air emissions and greenhouse gases, particularly in light of the replacement of the co-generation facility with the new energy systems, these data

points will not be required for the CEQA analysis, although can be briefly acknowledged in the EIR for informational purposes.

2. ESA concurs with Ramboll Environs approach in development of a "Fall 2035" analysis scenario that conservatively assumes year 2030 emission factors given that 2030 represents a watershed year for the purposes of GHG regulation in California.

Chapter 2: Air Quality Environmental and Regulatory Overview

Table 2-1-1 Summary of Ambient Air Quality in the Project Vicinity

3. ESA recommends this table include annual average monitored values for PM10 and PM2.5 given that the San Francisco Bay Area Air Basin is designated as a non-attainment for the state annual average standards for these pollutants, as indicated later in Table 2-2-2.

Section 2.1.3.3 TAC Emissions Sources in the Stanford Vicinity

4. ESA recommends this discussion also include gasoline fuel stations as potential TAC sources in the Stanford vicinity given that the University operates several such facilities and they are later included in the inventory.

Section 2.1.3.4 Sensitive Receptors

5. Residential uses are sensitive receptors, however, neither Section 2.1.3.4 (Sensitive Receptors) nor Figure 2-1 (Sensitive Receptor Locations) identify residential uses as sensitive receptors. If there is a reason why residential uses are not specifically identified as sensitive receptors, it should be explained in the study.

Chapter 4: Toxic Air Contaminant Emissions Inventories

Section 4.1.5 Fuel Stations

6. This section and Table 4-2 identify fuel stations within the study area, including the former Valero station, Bonaire and the LRBE fuel stations. However, BAAQMD's stationary source tool indicates that there is also a fueling station at the "Environmental Services Facility" on Oak Road, which appears to be within the study area. Please confirm if this fuel station is within the study area, and if so, if it is still operational and should be included in the inventory.

Chapter 5: Impact Analysis

Table 5-1-1 BAAQMD CEQA Air Quality Thresholds of Significance

7. ESA recommends the parenthetical reference to exhaust emissions for PM10 and PM2.5 be relocated to apply only to construction emissions.

Impact AQ-1: Localized Dust-related Air Quality Impacts

8. The analysis states that the Project would implement best management practices (BMPs) to ensure that fugitive dust for Project construction would result in less-than-significant impacts. However, unlike the Tier 4 construction assumption, these BMPs are not identified within the project description nor is there any

existing mechanism (such as a standard condition of approval) that ESA is aware of to ensure that these measures are implemented. To ensure implementation, these BMPs should be either identified as either a new Condition of Approval in the 2018 General Use Permit, or formally identified as a mitigation measure.

Criteria Pollutant Analysis for Construction Emissions

9. There is no impact statement or analysis assessing the quantitative emissions of criteria air pollutants from construction activity. Since the 2018 General Use Permit will authorize new construction activity that would not otherwise occur, ESA recommends a construction-related CAP analysis should be included in the AQTR such that these emissions are treated as new emissions and not as a continuance of existing campus construction emissions. For consistency between the AQTR and the EIR, ESA EIR requests the AQTR include a separate impact statement providing a construction-related CAP analysis that provides emissions estimates directly traceable to data in the tables of the AQTR. This construction-related CAP analysis should be consistent in its assumptions with that of that of the health risk analysis in terms of the scope and size of a conservatively estimated construction project under the 2018 General Use Permit.

Impact AQ-2 Construction TAC and PM2.5 Emission and Health Risks

10. Both the screening process described on page 50 of the AQTR and the potential option for a formal health risk assessment for future construction projects should be formally identified as either a new Condition of Approval in the 2018 General Use Permit, or as a mitigation measure.

11. Modeling assumes tier 4 *final* standards for all equipment except chainsaws and pavers. This use of tier 4 standards should be formally identified as either a new Condition of Approval in the 2018 General Use Permit, or as a mitigation measure.

12. Please confirm if the analysis considered exposure of receptors to off-site truck travel for hauling along the haul routes, or just the exposure of receptors to onsite trips. We recognize that it is unlikely that off-site truck travel alone will produce a significant cancer risk for relatively small construction projects, but off-site receptors may be much closer to the off-site haul route than receptors near the project site (e.g. if the screening criteria is 140 meters for childcare receptors near the project site, this doesn't account for a daycare that is 10 meters from the off-site haul route). If exposure to off-site truck travel was not included in the screening tables, we recommend that you either include it or add justification for why it isn't a concern (e.g. you could run an analysis of off-site risk along the haul route for the biggest project type with 900,000 cubic yards of debris/soil exported to show that cancer risk is not significant).

13. The AQTR indicates the risk for childcare facilities is higher than for residents. However, when considering residents include the 3rd trimester age group while childcare would not (as described in Table D-6), and that residents are exposed to the same concentration as childcare but for longer (24 hrs/day, 350 days per year for residents versus 8 hrs/day, 245 days per year for childcare), it seems counterintuitive that the risk for childcare facilities should be higher than for child residents. It appears that the higher risk for childcare facilities identified in the AQTR may be in part due to use of a higher 8-hour daily breathing rate (DBR) for moderate intensity activity, but is more due to the use of a Model Adjustment Factor (MAF). Please provide additional justification for the MAF, including citations to BAAQMD and/or OEHHA guidance for calculating risk to childcare receptors using the MAF (which we cannot seem to find; we only see guidance for a WAF used for worker receptors). Please see more detailed comments on Appendix D, Table D-6 below.

14. It would be useful for the reader if the AQTR showed the screening results in a table where you can easily trace the setback distances for each receptor type by project size/characteristics.

15. Please define "off-hours."

Appendix B CalEEMod Analysis

16. While the CalEEMod analysis indicates haul trips for assumed demolition, it does not appear to include any assumptions for haul trips associated with export of excavated soil. ESA recommends an assumption be developed for exported material truck trips consistent with the screening scenarios of the construction HRA mitigation.

17. As stated in the AQTR, it appears construction phases have been condensed to fit the assumed construction project within the confines of a calendar year. CalEEMod user tip[1] 21 states:

    > *For construction equipment calculations, the user should evaluate whether the default equipment list, including equipment types and numbers, horsepower ratings, hours of operation, and duration of phases, are appropriate. If changes are made to the equipment list, the program will neither automatically compensate by changing the construction time nor automatically revise the equipment list to reflect a revised construction time. Changes to one of these must accompany revisions of the other based on project-specific data.*

    Because the default number of construction equipment was assumed, this equipment must be more active to achieve that same amount of work is a shorter construction window. Consequently default construction equipment hours of operation should be adjusted proportionately to the reduction in assumed construction window.

18. EMFAC2014 does not include the effect of Low Carbon Fuel Standard (LCFS) (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf, page 8); please confirm if this text needs to be revised accordingly.

19. ESA recommends that specifying that all PM10 *exhaust* is considered DPM.

20. The BAAQMD recommends that the following TACs are estimated for gasoline vehicles: Acetaldehyde, Benzene, 1,3-Butadiene, Ethylbenzene, Formaldehyde, and Naphthalene. This is based on the speciation and risk values found in the Recommended Methods for Screening and Modeling Local Risks and Hazards report (May 2011, table 14), which is more up-to-date than the district's CEQA guidelines. The analysis appears to only include Benzene and 1,3-butadiene for gasoline mobile sources. ESA recommends updating the HRA to include these additional TACs.

[1] http://www.caleemod.com/

Appendix D Construction Health Risk Assessment Screening Tool

21. Page 1: ESA recommends providing a citation to support the following statement: "*In this analysis, given that source of emissions is diesel construction equipment engines, if cancer risk from diesel particulate matter (DPM) and diesel total organic gas (TOG) is below the threshold, then noncancer acute and chronic HI and PM2.5 incremental increase will also be below the threshold.*" Typically diesel TOG, non-cancer acute, and chronic HI risk is much lower than DPM cancer risk, but PM2.5 concentrations may not be. The ratio between annual average PM2.5 concentrations and DPM cancer risk varies based on construction project length (e.g. a 1-year project will have a smaller ratio than a 10-year project). It is possible, although unlikely, that PM2.5 concentrations exceed the threshold while cancer risk does not. One potential approach for justifying this statement (if a citation cannot be produced)_is to conduct a quantitative analysis of PM2.5 for your largest project site and comparing this to the cancer risk to show that cancer risk will always be greater.

22. Page 2: The dispersion modeling used 1 year of met data; OEHHA (2015) recommend at least 5 years of met data if available.

23. Page 2 makes reference to Figures D-1 through D-5, however, these figures are not included.

24. Page 3, ESA recommends specifying which version of CalEEMod was used.

25. Page 3: Please confirm if the equipment list, hours/day, and days/year for the modeled project (from the Escondido HRA) are based on an equipment fleet for a real construction project.

26. Page 3: The smaller projects were scaled down by the ratio in acreage. However, acreage isn't the best indicator of construction activity or emissions. This method would not account for vertical development (such as a 10-story building on a 1 acre site versus 2-story buildings on an 18 acre site). We recommend one of the following options: (1) use a hybrid scaling factor which incorporates square footage of construction; (2) use square footage instead of acreage as a scaling factor; or (3) include a discussion in the document to justify the use of acreage over square footage as a scalar or how you recommend that users approach the screening tables based on square footage over acreage (as mentioned on the 2/1/17 call with ESA).

27. Page 3: There may be economies of scale when constructing larger projects that aren't present in smaller projects, so the scaling ratio wouldn't necessarily be directly proportional to site acreage. For example, 3 excavators are used during construction of the 18.3 acre site (Table D-1); risk for the 3 acre site was scaled down by 3/18.3 which is approximately $1/6^{th}$, but you will have at least 1 excavator for the 1 acre site (versus ½ of an excavator). We understand that you are using the full 2 year emissions duration for the smaller projects, which may account for any loss in economies of scale for smaller projects.

28. Page 5: ESA recommends stating what the value of the conversion factor (CF) is in the equation.

29. Page 5: ESA recommends defining "CRAF" in the equation (if the CRAF is equivalent to the age sensitivity factor, then it may be duplicative of IF_{inh} which includes the ASF, as described in Table D-6).

30. Table D-1: ESA recommends defining what engine tier level was assumed for pavers (we assume this is fleet average, but please confirm).

31. Table D-4a indicates the onsite trip length is 0.5 miles but does not mention off-site trips and the exposure of receptors along the off-site haul routes. Please see comment #16 above.

32. Table D-5: The release height is identified as 0 meters for all sources. According to USEPA's report *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*, construction release height should be 4-5 meters. We recommend using a 4-5 meter source release height per USEPA guidance or providing an explanation (and citation) for using a 0 meter release height.

33. Table D-5: The receptor height is 0 meters. According to OEHHA (2015), "*For the inhalation pathway, a health protective approach is to select a receptor height from 0 meters to 1.8 meters that will result in the highest predicted downwind concentration*." Please confirm that 0 meters represents the highest predicted downwind concentration.

34. Table D-6: There is no 3rd trimester receptor listed in this table. The report says that exposure was estimated beginning at the 3rd trimester and the footnotes mention 3rd trimester breathing rates, but this appears to be omitted from the table. ESA recommends updating the table to include 3rd trimester for residents and the appropriate exposure duration (0.25 years).

35. Table D-6: The DBR listed in the table for childcare age 0<2 years is 1,500; the footnote says that moderate intensity 8-hour breathing rate is used (the 95th percentile value is 1,200 (Table 5.8), and that this breathing rate was "effectively extrapolated to 10 hours to account for potential exposure time." What is the rationale for the 10-hour extrapolation and what is the calculation (we assume 10/8)? Based on the MAF, childcare receptors are assumed to be present 9 hours per day, not 10 hours. In addition, both OEHHA and BAAQMD recommend the 95th percentile moderate intensity breathing rates from Table 5.8 without adjustment. Please clarify and provide an explanation or citation to support the adjustment of the 8-hour breathing rate. Also, please indicate in the table that the 95th percentile DBR was used for these receptors. The same comment applies to the DBR for childcare age 2<9 years (800 versus 640 from table 5.8).

36. Table D-6: Model Adjustment Factor (MAF): please add a discussion of this factor (equation, what it means, etc.) and a complete citation. We assume this is the same as the Worker Adjustment Factor (WAF) as specified by OEHHA on page 5-29, but applied to daycare receptors instead of workers. We also assume that parameters for the factor are: H_{res} = 24 hours; H_{source} = 9 hours; D_{res} = 7 days; D_{source} = 5 days; DF = 1. Please confirm.

37. Table D-6: This comment follows from comment #17 above regarding the use of the MAF for childcare. The exposure frequency (EF) for childcare should also incorporate the hours/day of exposure, since it isn't 24 hrs/day like child residents. This is needed because you have a MAF to scale up exposure for childcare based on their 8 hrs/day exposure. The childcare EF should therefore be 245 days/year * 9 hours / 24 hours = 91.9. Another way to explain this is by looking at the EF (units in days), which assumes each day has 24 hours of exposure. For daycare, the EF is 245 days. But the daycare receptors are not exposed to the annual average concentration 24 hrs/day for 245 days/year; they are exposed to the daytime concentration only 9 hrs/day, 245 days per year and zero concentration for the remaining 16 hrs/day. Thus, the EF should be adjusted downward by 9/24 to account for the total number of 24 hour days they are actually exposed to the annual average concentration. Then the annual average concentration can be adjusted upward to the daytime operational concentration using the MAF. If this step is not taken, then daycare receptors will always result in

higher risk compared to residential receptors (all other factors being equal), even though the daycare receptors are exposed to lower overall concentrations than residential receptors. Take the example where you have child resident receptors that are only present during construction work hours; their lifetime exposure is *less* than child resident receptors that stay home all day, so their risk should also be less. But if the MAF is used for the child resident receptors that are only present during construction work hours without adjusting the EF, their risk will be higher than the full-time child residents. If your approach of using the MAF for childcare receptors without adjusting the EF is documented in OEHHA or BAAQMD guidance, please cite that guidance (we are unable to find guidance for the use of the MAF for daycare receptors, only WAF for worker receptors).

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date	September 5, 2017
to	David Rader, Senior Planner, Santa Clara County Department of Planning and Development
from	Shadde Rosenblum; Paul Mitchell - ESA
subject	Peer Review of Transit and Bicycle Capacity Analysis for the Stanford University 2018 General Use Permit

At the County's request, the following are ESA's peer review comments on the *Stanford 2018 General Use Permit Transit and Bicycle Capacity Analysis* dated August 8, 2017, prepared by Arup for Stanford. The analysis identifies the increase in transit riders and bicyclists that would be expected to be generated by the Stanford campus under the 2018 General Use Permit, and evaluates the capacity of regional infrastructure and services to accommodate such increases.

ESA has focused its efforts in the peer review process to key areas of analysis and methodology relative to the assessment effects in the CEQA process, as well as to perform a general spot check of underlying tables, calculations and assumptions contained in the AQTR. The ultimate goal of the peer review is to help ensure that the information contained in this analysis will meet accepted standards for inclusion in a legally adequate and defensible document under CEQA.

1. Why aren't carpools affected by TDM Expansion scenario?

2. The change in annual growth rates 2016-2021 (4.9%) and 2021-2035 (1.6%) – not clear why so different.

3. Please fix column label on Table 4 – should be 2018, not 2020.

4. Will there be a temporary Caltrain capacity reduction while the electrification project is being constructed? If so, that should be addressed.

5. Assumption of increased express bus capacity in 2035 (one additional trip per line) is not based on programmed/funded service expansions.

6. What is the source of the assumption of peak period and peak hour factors that were used to convert daily ridership on express bus lines?

7. The annual growth rate used to estimate ridership was based on historical ridership data for two of the three transit lines. What about Line AE/F – why is 1.1% an appropriate growth rate to use, even though it's not supported by any historic ridership data?

8. The approach to bicycle capacity analysis does not take appear to take into account the additional bicycle users that would be generated by added rail passengers resulting from mode shift assumed for 2035 Expanded TDM scenario. I would imagine that a moderate number of rail passengers using Caltrain would bring their bicycles with them.

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date February 17, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Brian Pittman; Paul Mitchell, ESA

subject Peer Review of Biological Resources and Wetland Elements for the Stanford University 2018 General Use Permit Application

At the County's request, the following are ESA's peer review comments of supporting materials included in the Stanford 2018 General Use Permit Application that pertain to biological resources and wetlands. The elements of the General Use Permit Application relating to biological resources that were subject to review include a portion of the Background Conditions Report (Tab 4, Chapter 7, *Resource Conservation*), and technical reports that describe Biological Resources (Tab 14) and Wetlands (Tab 15). Our review focused on the accuracy and completeness of the presented technical information in the context of providing a clear summary of biological resources that is appropriate to support technical standards for review under CEQA. These comments are presented generally in chronological order as found within the document, not according to order of significance.

Background Conditions Report, Tab 4

Chapter 7: Resource Conservation

1. Chapter 7, *Resource Conservation*, begins by listing the resource conservation strategies that were identified in the Stanford Community Plan and then summarizes the 2000 General Use Permit conditions of approval that implemented these strategies. Conditions J.1 through J.9 established mitigation requirements to reduce impacts to the California tiger salamander and Conditions K.1 through K.7 related to the identification, management, and conservation of other wetland and biological resources. These conditions are appropriate for the *Regulatory Framework* section of the CEQA Biological Resources analysis and inform the discussion of biological resources in this chapter.

2. Section 7.1.1 describes the approach to compliance with the 2000 General Use Permit conditions of approval for the California tiger salamander. The section correctly presents that on August 13, 2013, the Santa Clara County Board of Supervisors acknowledged the County Planning Director's determination that the federal Habitat Conservation Plan (HCP) provides "equal habitat value and protection for the California tiger salamander," thereby superseding the conditions of approval related to the salamander provided by 2000 General Use Permit Condition J.9. The protection and management of California tiger salamander and their habitat at Stanford is presently regulated by authorizations from the U.S. Fish and Wildlife Service (USFWS)

and California Department of Fish and Wildlife (CFDW) that were not in place when the 2000 General Use Permit was adopted. We are aware of these regulatory changes and they will be documented in the EIR as appropriate.

Tab 14: Biological Resources Technical Report

3. The Biological Resources Technical Report provides a baseline summary of regulated biological resources at Stanford and then provides conservation measures for areas within the academic growth boundary to protect birds, bats, San Francisco dusky-footed woodrats and special-status plant species. ESA has no comments on this section.

Chapter 2. Introduction

4. Chapter 2 summarizes the contents of the technical report. A statement on Page 14.3 identifies three conservation measures that are presented in Appendix B to prevent significant impacts to biological resources. Appendix B describes four conservation measures; the measure protecting San Francisco dusky-footed woodrat appears to be mistakenly excluded from the summary.

Chapter 3. Approved Conservation Plans for Stanford Lands

5. This chapter introduces the federal and state regulatory framework that regulates campus growth and the specific management actions that are required to protect covered species. It describes the USFWS HCP and California CDFW consistency determination, which authorize the take of federal and state-listed species. As described in the *Background Conditions Report* (Tab 4), the chapter provides the basis by which the County determined that the Stanford HCP supersedes 2000 General Use Permit Conditions J.1 through J.8. The conservation easements and HCP management zones presented in the 2013 HCP are summarized, as are the conditions of the Special Conservation Areas. ESA has no comments on this section.

Chapters 4 and 5. Existing Biological Communities Within/Outside the Academic Growth Boundary

6. The biological resources report does not provide an environmental and regulatory overview discussion that sets the framework to discuss 2018 General Use Permit impacts. Though not a deficiency, this chapter would benefit from a presentation of applicable federal, state, and local regulations that apply to the General Use Permit planning area.

7. Chapter 4 describes the habitat types and associated plant and wildlife species that are present outside of the academic growth boundary; however, a parallel discussion is not provided in Chapter 5 that describes the presence, absence, or distribution of these resources within the academic growth boundary. For example, the discussion of natural resources in the Lathrop Development District (Section 5.1.1) only briefly states that the district "also contain(s) Oak Woodland/Savannah (same community type as described in section 4.1.2) with significant abundance of native plant species." Preferably, the analysis should detail existing conditions for biological resources within the academic growth boundary, as this is the area where impacts would occur and require mitigation.

   As currently presented, a description of existing conditions within the academic growth boundary cannot be transferred into the CEQA analysis without bringing in extraneous plant and wildlife data that does not apply

to this area. It is understood that much of the mandated natural lands management performed by Stanford under the HCP occurs outside of the academic growth boundary. However, the CEQA analysis will need to present a focused discussion of resources that occur within the academic growth boundary; even if the resources are somewhat banal.

8. It is unclear if any focused biological surveys have been performed by Stanford within the academic growth boundary. If such studies are available, a summary of surveys that are relevant to the CEQA analysis would be helpful in describing the existing biological resources and would also assist from a document defensibility standpoint.

Impact Assessment

9. The biological resources technical report defers the covered species impact assessment to the Stanford HCP and does not discuss potential impacts to other resources that are regulated under CEQA. Such an approach is adequate for biological resources that are regulated by the HCP, and specifically for federally-listed threatened species. However, for resources that are not described or regulated by the HCP, no potential impacts are disclosed related to 2018 General Use Permit activities.

    In the absence of an Impact Assessment section, we note the following:

    a) The report does not include or reference the CEQA standards of significance or establish impact thresholds. The standards of significance used in the 2000 General Use Permit EIR (Table 4.8, page 4.8-22, et seq.) differed from typical CEQA Appendix G standards. For example, the 2000 General Use Permit EIR considered impacts to California Native Plant Society Rank 3 and 4 plant species, loss of habitat for sensitive wildlife species, or permanent net loss of sensitive native plant communities. Coordination with the County will be needed to determine if the 2000 General Use Permit EIR standards of significance remain relevant and how they should be updated for the current analysis.

    b) The report does not acknowledge which of the natural resources described in the description of existing conditions could be impacted or otherwise affected by the proposed action, and whether such impacts would rise to the level of CEQA significance.

    c) Some significant impacts from the 2000 General Use Permit that resulted in conditions of approval were not carried forward into the 2018 General Use Permit. Potential effects to the following resources were not considered in an impacts and mitigation discussion:

        - oak woodlands
        - protected trees
        - wetlands (waters of the U.S. and waters of the state)

    e) The *Vegetation Management Plan* that is identified in the Background Conditions Report (Tab 4, Chapter 7, page 4.61) as a means to address the loss of protected trees and oak woodlands (and comply with Condition of Approval K.4) should be discussed in a biological resources impact section. The Background Conditions Report identifies that the Condition K.4 will be carried forward

with the 2018 General Use Permit; which is why impacts to protected trees and oak woodlands should be discussed in the biological report.

f) If applicable, justification should be provided for the retention or removal of current County Conditions of Approval that relate to biological resources that are regulated by the General Use Permit; specifically for Conditions K.1 through K.7, which are not regulated by the HCP.

g) Appendix B of the report suggests methods to reduce impacts to nesting birds, bats, San Francisco dusky-footed woodrats and special-status plant species within the Academic Growth Boundary. These methods are not associated with any particular impacts and the report does not state whether or not the methods would reduce impacts to less than significant.

h) No conservation measures are proposed for the protection of individual trees, oak woodlands, or riparian habitat.

i) The biological resources report does not discuss potential cumulative impacts to biological resources.

Tab 15: Wetlands Technical Report

The wetland technical report provides the U.S. Army Corps of Engineers (Corps) approved preliminary jurisdictional determination (PJD) dated December 28, 2015 within the Academic Growth Boundary. The Corps PJD was additionally provided to the San Francisco Bay Regional Water Quality Control Board (RWQCB), which has regulatory authority over waters of the state. Any proposed modifications to waters of the state that would substantially change the bed, channel or bank, or modify riparian habitat would require a 401 authorization from the RWQCB and a 1602 permit from CDFW. These permits require certification that potential impacts to waters of the state are analyzed and addressed under CEQA.

The wetland discussion on page 14.21 identifies that of the 36.6 acres of jurisdictional wetlands, 34.75 acres are in the HCP's 50-year no-build zone and cannot be developed and the remaining 0.88 acre of jurisdictional wetlands is located in areas where new structures are prohibited. If any maintenance or modifications are anticipated within regulated waters of the state, impacts should be acknowledged in the GUP EIR to provide CEQA coverage. If no modifications are proposed to RWQCB or CDFW jurisdictional areas, then the conservation measures in Tab 14, Appendix B (Biological Resources Technical Report, Supplemental Conservation Measures) need not reference the protection of waters of the U.S., waters of the state, and state-regulated riparian habitat.

Given the above discussion, is it correct to state in the EIR for the 2018 General Use Permit that no impacts would occur to waters of the U.S. or waters of the state?

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date February 22, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Cory Barringhaus; Jennifer Brown; Paul Mitchell, ESA

subject Peer Review of the Stanford University 2018 General Use Permit Application Tab 4 (Background Conditions Report), Tab 5 (Anticipated Changes to Population), Tab 6 (Housing), and Tab 16 (Parks and Recreation Facilities Analysis)

At the County's request, the following are ESA's peer review comments of Tab 4 (Background Conditions Report), Tab 5 (Anticipated Changes to Population), Tab 6 (Housing), and Tab 16 (Parks and Recreation Facilities Analysis) in Stanford 2018 General Use Permit Application. These comments are presented generally in chronological order as found within the document, not according to order of significance.

General (Tabs 4, 5 and 6)

1. *Revised 2018 Baseline to reflect change in status of EV Graduate Residences:* As directed by the County, for purposes of this EIR, the 2018 baseline is being revised in certain Stanford technical reports (e.g., AQTR, GHG, Energy, VMT and Transportation) to assume that the Escondido Village Graduate Residences would not be occupied or operational in 2018. For internal consistency please revise Tab 4, Background Conditions Report; Tab 5, Anticipated Changes to Population; and Tab 6, Housing, including tables and/or figures as appropriate to reflect that Escondido Village Graduate Residences would not be occupied or operational in 2018.

Tab 4 Background Conditions Report

Overview

2. The table on page 4.1, under the heading "Growth Rate" states "*Of the 2,035,000 net square of new academic and academic support and academic support uses authorized by the 2000 General Use Permit, Stanford has constructed or obtained building permits for approximately 1.4 million net square feet of new and expanded facilities*." This appears to be consistent with the Annual Report No. 15 "Key to Map C-1" which estimates 1,397,540 academic and support uses for which building permits have been obtained by Fall 2015.

   However, under the table on page 4.2, under the heading "Housing" text states "*Under the 2000 General Use Permit, Stanford has constructed approximately 2,400 new housing units/student beds*." If you are using the same data point (Fall 2015), this does not appear to be consistent with the Annual Report No. 15 "Key to Map C-2" which estimates only 2,019 housing units have been completed (through the framing phase) by Fall 2015. Please check whether there is any inconsistency, and/or if any revisions are needed.

Water Quality and Watershed Management

3. There is limited information included in the background conditions report regarding existing water quality conditions. While not required for inclusion in the Background Conditions Report, does Stanford maintain any water quality information that is specific to the surface waters that run through the campus that can be provided to ESA?

4. Under Flooding, the technical report states that "*As of June 1, 2016, the detention capacity remaining in each watershed would offset the following amount of additional development:*
    - *2,550,000 square feet of additional impervious surface in the San Francisquito Creek watershed*
    - *8,480,000 square feet of additional impervious surface in the Matadero Creek watershed*."

    Can Stanford estimate how much of this detention capacity will have been reduced there by 2018?

5. ESA suggests a slight rewording of the language under 7.2.4 State Water Resources Control Board NPDES General Permit Compliance. ESA's view is that all development, regardless of size, would be considered part of a larger plan (i.e., 2018 General Use Permit) and thus subject to the NPDES General Construction Permit requirements. Currently, the technical report states that it only applies to projects disturbing greater than one acre.

Geologic Hazards

6. Current language which refers to Stanford's Seismic Strengthening and Rehabilitation Program conforming to Uniform Building Code. The current California Building Code is based on the International Building Code and is no longer based on the Uniform Building Code. ESA assumes that Stanford's program would be consistent with these more current standards.

Tab 16 Parks and Recreation Facilities Analysis

7. While the Parks and Recreation Facilities Analysis appropriately focuses on demand and effects on off-campus public parks and recreation from the on-campus residential population, the analysis should also include an explanation how other segments of the Stanford population, including the "Other Populations" category (described in Section 4.0 of Tab 5) and visitors would not be expected to substantially contribute to the overall project demand and related effects for these facilities in the Stanford vicinity.

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date May 1, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Jeff Caton; Paul Mitchell - ESA

subject Peer Review of Energy Technical Report for the Stanford University 2018 General Use Permit

At the County's request, the following are ESA's peer review comments on the Energy Technical Report for the Stanford 2018 General Use Permit, dated April 13, 2017 prepared by Ramboll Environ for Stanford. The Energy Technical Report contains a comprehensive analysis of Stanford's energy usage and management, energy conservation measures, and procurement of renewable energy within the GUP Study Area.

ESA has focused its efforts in the peer review process to key areas of analysis and methodology relative to the assessment of energy impacts in the CEQA process as well as to perform a general spot check of underlying tables, calculations and assumptions contained in the Energy Technical Report. The ultimate goal of the peer review is to help ensure that the information contained in the Energy Technical Report will meet accepted standards for inclusion in a legally adequate and defensible document under CEQA. These comments are presented generally in chronological order, not according to order of significance.

Section 1: Introduction

Analysis Years and Existing Conditions

1. Since so many "analysis years" are introduced in the Introduction (2014, 2015, 2018, 2020 and 2035), ESA recommends clearly identifying 2018 as the baseline year up front to avoid confusion later in the document. As directed by the County, for purposes of this EIR, the near-term baseline will be 2018 (the year the proposed 2018 General Use Permit will be initiated), and this baseline will include all development under the 2000 General Use Permit expected to be built and occupied by the approval of the 2018 General Use Permit, along with other cumulative development expected to occur by that date.

2. The Energy Technical Report includes the evaluation of three "scenario years" to represent existing conditions: 2014, 2015 and 2018. While having analysis years of 2014 and 2015 lends historical perspective to the University's energy use, particularly in light of the efficiency gains represented by the replacement of the co-generation facility with the implementation of the Stanford Energy System Innovations (SESI), these data points will not be required for the CEQA analysis, although they can be briefly acknowledged in the EIR for informational purposes.

1.2.2 Existing Conditions Analysis Years

Project Analysis

3. ESA concurs with Ramboll Environs statement that the "Fall 2035" analysis scenario results in a conservative analysis of energy needs (results in an overestimate) because it is based on current regulations (e.g., Title 24, RPS) and vehicle efficiency standards that are likely to become more stringent before 2035.

Chapter 3: Existing Conditions and 2035 Project

3.1.1. Electricity

4. ESA recommends more consistent use of terminology to make it easier to follow the discussion. For example, does 2015 "campus usage" correspond to 2014 "imports to campus?"

5. With the new CEF having been brought online in April 2015, ESA agrees as reasonable the assumption by Ramboll Environ that doubling the July – December electricity usage is representative of a year's worth of electricity usage.

6. To improve clarity at the end of the third paragraph in this section, ESA recommends a brief explanation for why the 2020 electricity use estimate is relevant to the 2018 baseline, particularly since the following paragraph starting by stating that Fall 2035 electricity usage is based on Fall 2020 usage estimates.

7. ESA agrees with the assumption that the 2035 electricity consumption estimate is likely conservative, since is does not account for expected changes to the Title 24 efficiency standards that will reduce building energy use. However, there is no accounting for how higher numbers of electric vehicles on campus (converting the entire Marguerite shuttle bus fleet and 70 percent of Bonair on-campus vehicles to electric vehicles by 2035) would impact electricity demand. The reader is left pondering the whether the increase could be significant.[1]

3.1.2. Natural Gas

8. ESA agrees with the assumption that the 2035 natural gas consumption estimate is likely conservative, since is does not account for expected changes to the Title 24 efficiency standards that will reduce building energy use.

3.1.3. Mobile Fuel

9. The study notes that fuel usage should decrease from beginning to end of the Project, partly due to Stanford's commitment to replacing campus shuttles and vehicles with electric vehicles; however, it is not clear how the study incorporated the corresponding increase in electricity demand resulting from the additional electric vehicles (see comments #9 and #18).

---

[1] A quick calculation indicates that these vehicle conversions could increase annual electricity demand by approximately 4,000 MWh per year, or about 1% of the Project's 2018 electricity baseline. Based on information contained in Greenhouse Gas Technical Report (Table 3-5-14), Bonair vehicles travel 3,173,773 miles per year, while Marguerite buses travel 1,580,488 miles per year. The electricity consumption associated with converting these vehicles to EVs as planned would amount to approximately 670 MWh for the Bonair vehicles (using 30 kWh per 100 miles for a Nissan Leaf, as listed on www.fueleconomy.gov) and approximately 3,160 MWh (based on 2.0 KWh per mile for a mid-size commute bus, from US DOT 2014 white paper entitled *Peak Demand Charges and Electric Transit Buses.*)

Chapter 4. Impact Assessment and Mitigation Measures

4.3 Environmental Analysis

10. ESA generally agrees with the impact statements and significance determinations related to energy presented in Chapter 4. However, some minor changes to the text and tables in the following subsections would improve readability and clarity of conclusions.

4.3.1.1 Electricity

11. Adding "Baseline" and "Project" to the years 2018 and 2035, respectively, in Table 4-3-1 as done for the other tables in section 4.3, would help with clarity.

4.3.1.2 Natural Gas

12. Text should more carefully explain which years are being compared in these two sentences that refer to Table 4-3-2: "Total building energy consumption (natural gas plus electricity) per service population would decrease with the Project, from 31.4 to 30.2 MMBtu per year per service population. Since 2014, however, total building energy consumption is projected to decrease by 16% despite a more than 30% projected increase in service population."

13. Adding "Baseline" and "Project" to the years 2018 and 2035, respectively, in Table 4-3-2 as done for the other tables in section 4.3, would help with clarity.

14. There is a minor error in this statement –the difference is actually just under 35%: "Between 2014 and 2018, the building energy consumption per service population is projected to fall by over 35%."

4.3.3.1 Appendix F.II.C.1 Energy Requirements and Energy Use Efficiencies

15. Units are not provided for Diesel Fuel in Table 4-3-4 (Operational Energy Use Requirements)

16. ESA suggests relabeling Table 4-3-6 as "Total Energy Use Requirements"

4.3.3.2 Appendix F.II.C.2 Local and Regional Energy Supplies

17. The quantitative basis for this statement is not provided, "The transition toward electric fuels for on-site vehicles will result in a small increase in calculated total electricity usage that will not significantly impact overall electricity infrastructure. This small increase may be offset by gains in energy efficiency at the Stanford campus that are not quantitatively addressed in the energy usage calculations as noted above." (See also comment # 9).

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date February 1, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Chris Sanchez; Jeff Caton; Paul Mitchell - ESA

subject Peer Review of Greenhouse Gas Technical Report for the Stanford University 2018 General Use Permit

At the County's request, the following are ESA's peer review comments on the Greenhouse Gas (GHG) Technical Report for the Stanford 2018 General Use Permit, dated November 2016 prepared by Ramboll Environ for Stanford. The GHG Technical Report contains a comprehensive estimate of the Stanford's GHG emissions within the GUP Study Area and is clearly the result of many hours of extensive analysis and thoughtful consideration of sources at a time when the University is transitioning to a new method of energy production and recovery.

Given the task of peer reviewing such a document, ESA has focused its efforts in the peer review process to a few key areas of analysis and methodology relative to the assessment of GHG impacts in the CEQA process as well as to perform a general spot check of underlying tables, calculations and assumptions contained in the GHG Technical Report. The ultimate goal of the peer review is to help ensure that the information contained in the GHG Technical Report will meet accepted standards for inclusion in a legally adequate and defensible document under CEQA. These comments are presented generally in chronological order, not according to order of significance.

Chapter 1: General

Emission Inventory Years

1. As directed by the County, for purposes of this EIR, the near-term baseline will be 2018 (the year the proposed 2018 General Use Permit will be initiated), and this baseline will include all development under the 2000 General Use Permit expected to be built and occupied by the approval of the 2018 General Use Permit, along with other cumulative development expected to occur by that date. It is our understanding that Stanford has directed Ramboll Environ to update its GHG technical report as needed to ensure its 2018 baseline correlates with these assumptions, and that a revised GHG technical report will be forthcoming.

2. The GHG Technical Report includes analysis years of 2014 and 2015. While having analysis years of 2014 and 2015 lends historical perspective to the University's progress toward reducing greenhouse gases, particularly in light of the replacement of the co-generation facility with the new energy systems, these data

points will not be required for the CEQA analysis, although can be briefly acknowledged in the EIR for informational purposes.

3. ESA concurs with Ramboll Environs approach in development of a "Fall 2035" analysis scenario that conservatively assumes year 2030 emission factors given that 2030 represents a watershed year for the purposes of GHG regulation in California.

Chapter 2: GHG Scientific Background Regulatory Overview and Significance Thresholds

Global Warming Potentials

4. The International Panel on Climate Change (IPCC) published its most recent Fifth Assessment Report in November 2014, in which it updates its estimate of global warming potentials (GWPs) for non-CO2 GHGs. The analysis within the GHG Technical Report, however, uses the GWPs from IPCC's Fourth Assessment Report. Use of the older GWPs from the Fourth Assessment Report may be warranted for the purposes of maintaining consistency with accounting. Nevertheless, ESA recommends that a subsection should be added to the GHG Technical Report that 1) acknowledges the existence of updated GWPs, 2) provides a rationale for continuing to use the GWPs from the Fourth Assessment Report and 3) provides an explanation for how the change in IPCC's GWPs over the past years is considered in the derivation of thresholds in Table 5-2-4 (Operational GHG Thresholds/Substantial Progress Efficiency Metrics) which use a baseline of 1990.

2030 Target Scoping Plan Update

5. Since the draft 2030 Scoping Plan was released, ARB published a Discussion Draft of 2030 Targets for the Scoping Plan Update. This Discussion Draft was released on December 2, 2016 so it would not have been possible for Ramboll Environ to have included any of the specific approaches in the GHG Technical Report that was published in November 2016. The Draft 2030 Targets for the Scoping Plan Update contains recommended Plan-level GHG Reduction Goals.

   In this update, ARB recommends that local governments aim to achieve a community-wide emissions of no more than 6 metric tons (MT) of CO2 per capita by 2030 and 2 MT of CO2 per capita by 2050. ARB states that this is a statewide goal based on all emission sectors in the State and that local jurisdictions may choose to derive region-specific, evidence-based per capita or service population GHG emission goals tied to these statewide goals.

   While these goals are currently present within a discussion draft document, they represent ARB's thinking at the time of the NOP and should be acknowledged and considered in the GHG Technical Report. ESA recommends that per capita emissions be calculated as presented both in the GHG Technical Report and the Draft EIR for informational purposes, but that the Service Population thresholds developed by Ramboll Environ continue to be used as the thresholds for GHG impact assessment.

Chapter 3: GHG Emission Inventories

General

6. In general, the GHG Technical report identifies and quantifies the appropriate sectors for analysis of land use development projects and explains why some sectors, such as sequestration loss, are not warranted. Emission inventories are presented in 26 tables following the main body text of the report. ESA performed a desktop review of the tables, in which all results appeared reasonable (i.e., columns totaled correctly, and headers contained appropriate units etc.), as well as to be supported by citations of sources used.

Table 3-3-1 2014, 2015, Fall 2018, and Fall 2035 GHG Emissions - Summary

7. Tab 5, Anticipated Changes in Population, in the 2018 General Use Permit Application contains estimates of anticipated changes to population under the 2018 General Use Permit, quantifying certain segments of the Stanford population (e.g., Undergraduates, Graduate Students, Postdoctoral Students, Faculty, and Nonmatriculated Students), and not quantifying "Other" populations that frequent Stanford (e.g., Contingent, Casual, Temporary Workers, Other nonemployee Academic Affiliates, Third Party Contract Workers, Janitorial and Construction Contract Workers).

   The crux of the GHG impact assessment relies on the emissions per service population metric. The derivation of GHG emissions are explained in the Table 3-3-1 and supporting text. Table 3-3-1 identifies the 2035 service population (residents plus workers) to be 68,781. This service population is consistent with the service population estimated in SB 743 VMT Analysis, prepared by Fehr and Peers, in Tab 8 in the 2018 General Use Permit Application. The SB 743 VMT Analysis, Tables 3 and 4 appear to account for both the Stanford population that was quantified in Tab 5, as well as the "Other" population that was discussed in Tab 5.

   No revisions are requested to the GHG study as it relates to this issue. However, the EIR Project Description will acknowledge all potential segments of population related to Stanford University that are discussed in Tab 5 of the 2018 General Use Permit Application.

8. While the assumption that a segment of students of a university may be considered employees and therefore part of the service population is reasonable, the anticipated changes in populations and residents in the summed number of the Tab 5 submittal both contain the same categories of undergraduates, graduate students, post-doctorate scholars and faculty and staff. Some degree of this double counting phenomenon would expected in a land use development project (e.g., the resident of a Specific Plan who also it is also an employee of an office building within the specific Plan area). However, here more than 50 percent of the academic population is also counted as part of the residential population, which results in a higher service population and therefore, lower emissions per service population. This higher percentage may further warrant inclusion of a per capita emissions estimate and comparison to goals of ARB's Draft 2030 Targets for the Scoping Plan Update, as discussed above.

   Regardless, ESA recommends that supporting text be provided to the GHG Technical report that explains the derivation of the service population assumption since it is such a vital component of the impact analysis.

Mobile Emissions Tables 3-5-12 through 3-5-15

Methane and Nitrous Oxide

9. The mobile emissions tables only provide emissions of CO_2 and omit any mention of either methane (CH_4) or nitrous oxide (N_2O) either via quantification or footnote. Although the relative contributions of these other two GHGs are marginal compared to that of CO_2, for most vehicle types, it is common industry practice to report all three GHGs (the CalEEMod model reports these emissions for mobile sources). It is noted that the contributions for CH_4 and N_2O are provided for all other inventoried sources in the GHG Technical Report. Any vehicles running on compressed natural gas could have a statistically significant contribution. Consequently ESA recommends that either a contribution be calculated for these other GHGs for mobile emissions or a rational provided for why there are not presented.

Table 3-5-15 Fall 2035 GHG Emissions - Mobile Use

10. Table 3-5-15 (Fall 2035 GHG Emissions – Mobile Use) shows that all Marguerite buses will be electric by 2035 and that 70 percent of LBRE and Bonair vehicles will be replaced by electric vehicles by 2035, representing a substantial reduction of over 3,000 MT of CO2e compared to 2018. However, there is no specific corresponding increase in electric demand emissions associated with charging those electric vehicles noted in Table 3-5-6 for year 2035 which considers a 22 percent increase in consumption based only on increased square footage.

Tables 3-5-22 through 3-5-25 Water and Wastewater

11. These tables provide estimates for GHG emissions that result from wastewater treatments resulting from wastewater generated in the study area. It is unclear why these calculations include adjusted emissions for facultative lagoons and septic tanks. Are there any such treatment sources in the study area? It would be reasonable to assume that all wastewater flows to the Palo Alto Treatment Plant and be aerobically treated.

Chapter 5. Impact Assessment and Mitigation Measures

Significance Thresholds

12. ESA reviewed Tables 5-2-2 and 5-2-3 which present the derivation of the thresholds proposed to be used for 2030 and 2050. The derivation is based on 1990 land use sector emissions inclusive of on-road passenger vehicles, on road heavy-duty trucks, electric power, and commercial and residential fuel use. The analysis then considers these sectors on the local scale of the Study Area to assess significance. Such a methodology should be adequate to address both Post 2020 GHG reduction goals as well as recent legal opinions in the November 2015 California Supreme Court ruling in the *Center for Biological Diversity vs. California Department of Fish and Wildlife* (commonly referred to as Newhall Ranch). ESA intends to provide further justification of these thresholds in the Draft EIR in light of recently published White Paper of the Association of Environmental Professionals[1].

    There is a slight difference in the underlying GHG target for 2030 and the employment estimate used to derive the 2030 efficiency threshold presented in Table 5-2-2 than one used in a recent presentation of the

[1] Association of Environmental Professionals, *Final White Paper Beyond 2020 and Newhall: A field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*, October 18, 2016.

Bay Area Air Quality Management District[2]. However these differences are minor and the threshold applied in the GHG Technical Report (2.7 MT of CO2e) is more stringent than the one proposed by BAAQMD (2.8 MT of CO2e).

Impact GHG-2

13. No finding of significance is provided in the impact statement on page 55 as is done for Impact GHG-1. Also, the last sentence on page 60 states that the " Project's impacts are less than significant with mitigation under this methodology" even though mitigation measures are neither identified or warranted.

[2] BAAQMD, Presentation by Dave Vintze, Air Quality Planning Manager at the CLE International 12th Annual Superconference, December 12, 2016.

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date February 22, 2017

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Jennifer Brown; Cory Barringhaus; Paul Mitchell, ESA

subject Peer Review of the Water Supply Assessment for the Stanford University 2018 General Use Permit Application

At the County's request, the following are ESA's peer review comments on the Water Supply Assessment (WSA) Technical Report prepared by Schaaf and Wheeler Consulting Engineers for the Stanford University 2018 General Use Permit, dated November 2016. The WSA contains a comprehensive estimate of Stanford's water demand through 2035 within the General Use Permit Study Area. ESA has focused its efforts to a few key areas of analysis and methodology relative to the assessment of water supply impacts in the CEQA process as well as to perform a spot check of underlying tables, calculations and assumptions contained in the WSA. The ultimate goal of the peer review is to ensure that the information contained in the WSA will meet accepted standards for inclusion in a legally adequate and defensible document under CEQA.

Tab 13 Water Supply Assessment

Section 1: Introduction

1.1 Project Overview

1. The WSA indicates the 2018 General Use Permit references 2.275 million gsf of academic and academic support uses and 3,150 housing units/beds during the period of 2018 to 2035. The 2018 General Use Permit also proposes 40,000 net new square feet of child care space to be developed (separate from the 2.275 million gsf and 3,150 housing units), however, the WSA does not appear to specifically mention this proposed project element, and thus may not specifically account for the water demand associated with this future use. While the proposed child care space would constitute only a small part of the overall new development at the campus under the 2018 General Use Permit, its estimated water use should nevertheless be accounted for in the WSA.

1.3 Identification of "Public Water Systems" Serving the Project Site

2. The WSA describes the three sources of water supply at Stanford [water purchased wholesale from the San Francisco Public Utilities Commission (SFPUC); groundwater and local surface supplies]. The WSA explains that Stanford, as a private entity, does not serve the general public. The WSA indicates that the SFPUC does not serve as a "public water agency" when it provides water to its wholesale customers

(including Stanford). The WSA also explains that Santa Clara Valley Water District (SCVWD) does not serve as a "public water system" as it relates to Stanford's withdrawal of groundwater from its campus wells pursuant to its water rights. In addition, the WSA discusses that there is no "public water system" associated with Stanford operation of two reservoirs (Searsville Reservoir and Felt Reservoir) pursuant to its water rights and diversion licenses. The WSA concludes that there is no identified "public water system" serving the Stanford campus, and as a result, Santa Clara County - as the CEQA lead agency is the responsible governing body for preparation and approval of the WSA – is responsible for preparation and approval of the WSA. ESA agrees with the information in this description.

Section 2: Project Description2.2 Potable Water Demands

Baseline considerations and water generation rates:

4. For potable water demand, the WSA's analysis uses pre-drought conditions (Fiscal Year 2012-13) for the starting point to in order to capture pre-project conditions more accurately than subsequent years, during which drought conditions temporarily but substantially affected campus water usage. The WSA also refers to water usage in 2015 in other parts of the analysis to provide an additional point of comparison to the future projected water use under the 2018 General Use Permit. ESA concurs with Schaaf and Wheelers approach to use pre-drought conditions (Fiscal Year 2012-13) conditions, as it would be representative of a "normal" year from which to then develop the baseline and water generation rates.

5. Furthermore, in order to capture an accurate water use baseline by accounting for water use generated by the incremental growth anticipated under the 2000 General Use Permit by 2018, the WSA's approach considers the incremental development from 2012 conditions through 2017 reflecting a water use multiplier determined during 2012-13. ESA agrees that this approach provides for estimation of an accurate base line for this EIR. Thus while Fiscal Year 2012-13 will represent the baseline water demand rate, the baseline for the project under CEQA will be 2018. Please also additional comments on 2018 baseline in No. 6 and 7, below.

6. *Table 2-1 Summary of Existing and Proposed Development* ESA compared the academic and housing development quantities used to generate water demand and usage as derived in Table 2-1 with the values presented elsewhere in the 2018 General Use Permit application, including Tab 4, Background Conditions and Tab 5, Anticipated Changes to Population.

    - The estimated 2015 and 2018 academic square footages (sf) derived from Table 2-1 in the WSA (9,517,505 sf and 10,286,859 sf, respectively) match that listed in Table 4, Sec. 2.1 of Tab 4 of the General Use Permit Application.

    - The estimated 2015 and 2018 student housing derived from Table 2-1 in the WSA (11,882 and 14,318, respectively) are slightly higher than listed in Table 9, Sec. 4.1 of Tab 4 of the General Use Permit Application (11,900 and 14,300, respectively).

    - The estimated 2015 and 2018 faculty/staff dwelling units derived from Table 2-1 in the WSA (937), match that listed in Table 3, Tab 5 of the General Use Permit Application.

7. *Revised 2018 Baseline to reflect change in status of EV Graduate Residences:* As directed by the County, for purposes of this EIR, the 2018 baseline is being revised in certain Stanford technical reports (e.g., AQTR, GHG, energy, VMT and Transportation) to assume that the Escondido Village Graduate Residences would not be occupied or operational in 2018. For internal consistency in Stanford's technical reports, confirm if the 2018 housing estimates presented in WSA (e.g., "Projected Development 2015-2018" in Table 2-1, text discussion on page 9 of additional housing "scheduled for completion by Fall 2018," etc.) need to be revised as well to reflect that EV Graduate Residences would not be occupied or operational in 2018? This will not, however, affect the 2035 buildout demand estimates.

Section 3: Existing Water Demands

3.1 Historic and Current Water Demands:

8. While this section addresses SFPUC's 2009 Water Supply Agreement and Stanford's holding of a long-term "Individual Supply Guarantee" (ISG) of 3.03 mgd overall annual average, and the "Interim Supply Limitations" (ISLs) in effect until 2018 (3.03 thereafter), ESA notes the agreement ends in 2034 (https://sfwater.org/modules/showdocument.aspx?documentid=8632).

9. The WSA identifies a potential inconsistency with the SFPUC 2016 UWMP: The SFPUC UWMP included Stanford's projection that purchase requests will increase from 2.00 mgd in 2015 to 2.40 mgd in 2035. The WSA projects a slightly higher demand at 2.44 mgd, which is still well within the limits of Stanford's ISG and ISL. It may also be important to include why it is okay for the project to generate a demand above the SFPUC 2016 UWMP, by being approved within the 2009 Water Supply Agreement.

AECOM
Post Montgomery Center
One Montgomery Street
Suite 900
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	David Rader, Santa Clara County	Pages	7
CC	Kavitha Kumar, Santa Clara County		
Subject	2018 General Use Permit review of TIA (Tab 7) sections 3 and 4 and Appendix B only		
From	Lilia Scott, Nichole Seow, and Greg Gleichman, AECOM		
Date	December 16, 2016		

The AECOM team is tasked with conducting a peer review of each transportation-related document submitted in the GUP application to verify that the documents follow generally acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] Below please find AECOM's comments on TIA (Tab 7) Sections 3 and 4 and Appendix B of the Application. We have comments on the other transportation sections, but they will come later.

The summary is this: while the application contains an appropriate level of detail for the public, it does not contain enough information for a peer review. You will see in the below that we are requesting a number of technical memos so we may perform our peer review on the analysis.

Stanford GUP 2018 Application
Transportation Impact Analysis (Tab 7) – Review Comments on Sections 3 & 4, Appendix B

Comment Number	Section	Page	Description	Comments
1			Entire document	Page numbering is confusing the way is starts over at page 1 in every Tab and appendix. Consider putting the Tab/appendix name with each page number.
2	1	3	2nd & 3rd para – mention of the 16 gateway roadways, 8 parking structures (1 is under construction) and surface parking lots	Can applicant provide location maps (or list) showing the 16 roadways and parking areas? Suggest adding the monitoring maps.
3	2	6	Last para – states that the "TDM program has successfully maintained the AM and PM peak-hour traffic volumes below the 2001 baseline volume".	Correlation does not necessarily equal causation. Need to rephrase for accuracy.

[1] This language is pulled from the scope in our contract for this project.

4	2	9	2nd para – mentions the 2015 annual transportation survey being used	Need to explain why the report uses 2015 data instead of more recent data (we presume it is for consistency, i.e., 2015 is most recent year where a full data set is available).
5	3	13	1st para – states that "undergraduate resident trip rates were estimated from the graduate student resident rates based on proportional parking permit ownership data" because it was not easy to isolate undergrad housing for data collection due to their locations.	Need to see data sources and detailed analysis to review and replicate for Peer Review. What is the rate of parking permit issuance to grad and undergrad? This data should be shown.
6	3	13	1st paragraph reports that data collection occurred to support this analysis.	We request a technical memo describing the methodology for collecting and analyzing this data to produce the trip generation rates. To do a peer review, we need to know the locations, times and dates when data was collected, a description of the data collection process in the field, and any subsequent data processing that took place to produce the trip generation results. Also, the tech memo and the appendix containing the data need to be referenced in the report near the table presenting the actual results.
7	3	13	2nd para – AM & PM peak hour trips	Peak hour-peak direction is correct. However, 1) these are "adjusted averages" and need to be called the correct name, and 2) We need another technical memo describing how the off peak direction totals were extrapolated (last sentence).
8	9	13	Last para – briefly described methodology of estimating existing peak hour trip generation rates.	Last sentence: state why these counts are presented for evaluating congestion. Describe methodology in more

				detail for peer review.
9	3	13-14	Paragraph that overlaps pages: “reliable data” on housing occupancy	Need to state source of “reliable data” referred to in the text, and why it is deemed to be reliable. Show data and discuss any strengths / weaknesses (such as friends / partners sharing housing without permission).
10	3	14	2nd para – states that peak hour peak direction trips generated by new campus housing is “more than offset by the decrease in non-residential peak direction trips during the peak commute period”.	What is the basis of this statement/assumption? Need to provide proof of statement (i.e. data supporting this conclusion).
11	3	14	2nd para – states that the total trip generation rate based on academic facilities square footage is conservative and would not be exceeded by additional campus housing	See comment 10. Need to include data that supports this conclusion.
12	3	14	Last sentence: weighting graduate and undergraduate rates	Need a technical memo showing work including data
13	3	14	Table 2	a. Provide methodology (with an example) and data used to make calculations. b. 2nd row, missing footnote? c. In the 2000 GUP, this table was much more detailed. Why is table abbreviated? If this is by choice, it needs to be explained and so that stakeholders can evaluate the new approach.
14	3	15	Table 3	County to confirm data
15	3	15	Last sentence	Regarding the statement that Stanford has always achieved “no net new commute trips” –

				this is only true when the trip credits are subtracted. But the trip credits are not actual trips, they are credits for external activity. This needs to be rephrased for accuracy.
16	3	17	Table 6	Mention that table is subtracting resident trips to use different trip distribution data. Mention GUP time horizon.
17	3	17	Second to last paragraph	Reword to clarify meaning.
18	3	17	Last paragraph	What is this based on?
19	3	18	Figure 4	How is the data obtained? Need to show work.
20	4	19	1st para – states that "adjustments were made to the survey response to remove bias due to participation of those in the Clean Air Cash program ".	What is the bias and what was this adjustment? Show data and show work.
21	4	19	1st paragraph, 2nd sentence	"Establish" is too strong a word. Use "estimate" or "extrapolate"; the survey responses are not perfect.
22	4	19	Bullets	These bullets need to be accompanied with a technical memo including the raw data and detailed analysis for us to provide a peer review. We need to see and replicate your work. 3rd bullet: what is the threshold for statistical significance? 4th bullet: what were the adjustments made for the Clean Air Cash recipients and why? A map or series of maps would be helpful in the technical memo.
23	4	19-20	Figure 5 and its description	Remove mention of Caltrain access to SF location.
24	4	19, 21	Table 7 and its description	Did the commute survey ask people's travel route? If yes, we need to see the data. If no, we need to know how these routes were selected. We need a full description of the process so

				we can replicate it for a peer review (another technical memo would be good). These do not appear to us always to be the correct routes. Last sentence pg 19 “represent” is too strong a word. We suggest “estimate” or similar. Also missing “that” after “patterns”.
25	4	22	Figure 6	a. The project trip and internal trip distributions do not add up to 100% (separately). Should they? b. Are these percentages derived from Table 7? c. What do the percentages (2% & 7%) on both sides on University Ave represent? The legend is incomplete. d. Legend: internal vs. project trips? What do these terms this mean? Did you mean internal and external trips? e. Same questions as on Table 7: we need the raw data to be able to replicate this analysis for a peer review.
26	4	23	1st para – states that the 2035 analysis will also account for the ‘redistribution of regional housing under the Plan Bay Area Regional Transportation Plan and Sustainable Communities Strategy’.	It appears that trip distribution has not yet been identified for 2035. When will it be available? More details are needed on the adjustments. Show this data and how it was used it in the analysis.
27	4	23	2nd para – CTPP data	Provide methodology details and data leading to summary in Table 8
28	4		3rd para, second and third sentence	2nd sentence: The campus census tracts do (or not) include the SUMC or shopping center (typo in sentence?)?

				3rd sentence: “This census tract” which one? The previous sentence appeared to be referencing two (2) tracts while “this” indicates only one. Provide tract numbers, show map (can be in a technical memo).
29	4	25	Table 8	Does the ‘Roadways’ column indicate the major streets used by commuters to the different geographical areas? How is this determined? Need to show work and provide data for peer review. (same as comment 24 on Table 7)
30	4	26	Figure 7	Same comments as Figure 6: a. The project trip and internal trip distributions do not add up to 100% (separately). Should they? b. Are these percentages derived from Table 8? c. What do the percentages (1% & 10%) on both sides on University Ave represent? d. Legend is confusing and incomplete.
31	Appendix B		Trip generation counts	a. This appendix was not referenced in the text at all. b. Provide information and details on how this data was used: 1) need full description of data collection methodology, and 2) need full description of subsequent analysis methodology so we can replicate it for our peer review. c. This data appears to cover only the faculty/staff and

				graduate residential areas. Please provide counts used to establish All Campus Trips generation rates, or cite document and location within document where they can be found.

TITLE: 2018 General Use Permit: Parking On- and Off-Campus

Introduction

Parking is an important campus resource. The University strives to provide enough parking to serve the demand generated by faculty, staff, students and a wide range of visitor types, while actively encouraging its employees, residents, and visitors to travel via means other than driving alone. This is achieved both through provision of physical parking spaces, and also pricing of those parking spaces.

When the County Board of Supervisors approved the 2000 General Use Permit, it authorized construction of up to 2,300 net new parking spaces on the campus- which roughly equated to the number of parking spaces needed to meet the projected increase in campus demand. Stanford has not exhausted the 2000 General Use Permit parking authorization. Even though faculty and staff populations grew under the 2000 General Use Permit, permit purchase rates per square foot of academic and academic support space declined and then leveled off. This likely was due to Stanford's successful transportation demand management programs, which encourage commuters to take transit and other alternative modes to work. Purchases of parking permits by campus residents- in particular graduate student residents- also declined on a per bed basis. This likely was due to a shift in values away from car ownership, as well as the programs Stanford provides to enable students to travel when needed without having a car on campus.

Because Stanford has not used all of the parking authorized by the 2000 General Use Permit and because Stanford intends to continue to meet the Stanford Community Plan's goal of no net commute trips, Stanford proposes to live within the remainder of the 2000 General Use Permit allocation-- with no increase to that allocation under the 2018 General Use Permit. This will require further reductions in the parking permit purchase rates by campus commuters and student residents.

Stanford proposes some modest changes in the way that parking spaces are counted under the use permit. Since approval of the 2000 General Use Permit, Stanford has installed approximately 40 electric charging stations in campus lots (with 2 ports for 80 parking spaces). Campus residents and commuters using the charging stations must move their cars away from the station as soon as active charging is complete. This means there must be another long-term parking space available. Stanford does not seek to change the way that such long-term spaces are counted. However, Stanford does request that the County exempt from the count the short-term electric charging station spaces; this would avoid counting parking for the same commuter or resident twice.

Stanford proposes that spaces used for transportation demand management purposes also not be counted. For example, Stanford provides spaces for zip cars and rental cars. These cars are available so that commuters can take public transit, vanpools, or bike or walk to campus rather than drive. For example, if a commuter needs to attend a mid-day off-campus meeting or appointment, they can take the train to work and have access to short-

term vehicular use. These cars also enable students living on campus to refrain from bringing a car. They can rent a car for occasional trips home or to visit locales that are not served by transit.

Stanford proposes that the spaces used by the police or fire departments should not be counted as those spaces cannot be used by residents or commuters. And Stanford proposes that the current General Use Permit exemption for parking to serve faculty/staff housing in the Campus Residential -- Medium-Density and Campus Residential -- Low Density zones be extended to parking to serve high-density faculty/staff housing on the Academic Campus. (When the 2000 General Use Permit was approved, Stanford only contemplated building new faculty/staff housing on the medium and low density sites.)

Finally, Stanford proposes that the 2018 General Use Permit include a 2000-space parking reserve. 2000 spaces corresponds to the amount of parking that would be needed if parking demand were to continue at its current rates-- based on parking spaces per academic square foot and spaces per student bed. Stanford would not be allowed to construct any of the parking in the reserve unless it obtains Planning Commission approval under one of three circumstances:

- Stanford is achieving the No Net New Commute Trips goal;
- 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.

This paper outlines the existing on-campus parking conditions and programs, the basis for the proposed 2018 General Use Permit request, and the off-campus parking control mechanisms that are in place to minimize neighborhood parking by campus users, local high school students, visitors to downtown businesses and others.

On-Campus Parking

Parking on the Stanford campus is a carefully managed resource. The University strives to provide enough parking to serve the demand generated by faculty, staff, students and a wide range of visitor types, while actively encouraging its employees, residents, and visitors to travel via means other than driving alone. Stanford's Parking and Transportation Services (P&TS) administers both the parking program and other major transportation programs. Its key parking responsibilities include the sale of permits, management of parking inventory, and promotion of alternative modes of travel.

Parking Lot Locations

Parking is distributed throughout the Stanford campus with the exception of the pedestrian campus core. The campus includes eight 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.

Commented [JRH1]: I think it would be helpful to the reader if the capacity (number of spaces) of each parking structure and lot were presented.

While there have been new parking structures constructed under the 2000 General Use Permit, they have largely replaced other parking facilities on campus. The University 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.

Commented [JRH2]: I think it would be helpful to provide numbers here; i.e., how many new spaces have been provided (in structures), and how many have been removed (assumed to have been in surface lots)?

Parking Inventory by Permit Type

Parking spaces on the Stanford Campus are classified into six permit types:

- "A" commuter permits (and carpool permits) which typically provide the most convenient access to buildings on campus
- "C" and "Z" commuter permits (and carpool permits) are located farther away from the center of campus. "C" Permits are issued to University affiliated commuters, while Z permits are issued to Hospital affiliated commuters.
- "MC" commuter permits are provided specifically for motorcycle commuters
- "Res" Residential permits (residential permits correspond to residential areas EA, ES, SH, SJ, SO, and WE)
- Visitor spaces (pay-by-space, as well as "E" event permits)

Several variations occur within these six permit types. For example, some "A" and "C" zones are specifically reserved for carpools or service vehicles. A, C, and MC permits are also color-coded and stamped based on whether they are issued to a University or Hospital employee. Residential permits are subdivided into six permit types by location on campus (EA, ES, SH, SJ, SO, and WE permits). Some visitor lots allow all-day parking, while others are limited by time.

Parking Occupancy

Based on data from the P&TS parking inventory, approximately 86 percent of University spaces are occupied on a typical day when the University is in session, which indicates that there is enough supply to minimize spillover parking in the areas surrounding the campus. The University'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.

Commented [JRH3]: What year?

Commented [JRH4]: I think it would be helpful to provide the parking occupancy for each facility (structures and lots). The next paragraph refers to the highest and lowest occupancy levels, but seeing the occupancy for each facility would be informative.

Commented [JRH5]: I assume this means "Monday through Thursday" based on the next paragraph.

University-affiliated parking occupancy tends to be fairly consistent from Monday through Thursday of a typical week, with lower occupancy rates on Fridays. Parking occupancy tends to be highest near the core of the academic campus (>90 percent occupied) and lowest near the campus periphery (<75 percent occupied) for both commuter and residential lots. The Campus Center and East Campus districts provide the largest numbers of parking spaces, but show slightly lower occupancy overall due to a high proportion of residential and visitor spaces.

Commented [JRH6]: Provide a range of these lower rates (so the reader can see how much lower they are than on Monday-Thursday).

Occupancy and Permit Sales over Time

The total number of active campus commuter and residential permits has declined from a high of nearly 21,000 permits in 2004-2005 to fewer than 18,000 in 2015-2016. During this time frame, enrollment in the Commute Club has steadily increased, more than doubling since 2002-2003. These two trends reflect Stanford's development of a robust program of transportation demand management measures to contain traffic growth in response to the Stanford Community Plan's No Net New Commute Trips goal. Most notably, permit sales have remained fairly steady, even as the square footage of the campus has increased under the 2000 General Use Permit.

Commented [JRH7]: "This timeframe" is 2004/05 – 2015/16, and 2002/03 is outside that period of time. How much has enrollment increased since 2004/05?

Commented [JRH8]: The first sentence says permit sales have declined, which is not "have remained fairly steady". Clarify which is the accurate statement.

Campus Visitors and Event Attendees

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). The University hosts around 900,000 visitors and event attendees annually. Visitors come to campus for a wide range of purposes, including cultural events (museums, Bing Concert Hall, etc.), athletic events, alumni center visits, walking tours of the University, conferences/symposiums, and extended work or study commitments by non-Stanford affiliates. The 900,000 visitor estimation is based largely on event attendance statistics, and so will include some overlap with Stanford affiliates. It also includes individuals arriving at campus by all modes of transportation; not all of these visitors require parking at the University.

Parking Permit and Fee Structures

All parking on the Stanford Campus is paid parking during weekday business hours. Residential permits are enforced 24 hours a day, seven days a week, while commuter permits are enforced from 6:00 AM to 4:00 PM on weekdays. Most visitor areas are enforced from 8:00 AM to 4:00 PM on weekdays. The exception is the Oval, which is enforced from 8:00 AM to 6:00 PM weekdays. Non-residential ~~P~~permit and visitor spaces on ~~evenings and~~ weekends, and outside the above-cited time periods on weekdays, are unrestricted.

Parking Permit Pricing

Parking permit prices vary by permit type and duration. Commuter and residential permits are available on a daily, monthly, 10 month (academic year) or 12 month basis. Daily visitor permits are available, while some special events or conferences offer monthly permits. Daily commuter and residential permits are not available to the general public, and are limited to five per person per month (or eight per person per month for Commute Club members).

Pricing varies based on permit type. 'A' permits are the most expensive given they typically provide the most convenient access, while 'C,' 'Z,' and residential permits are less expensive. A permits range from $11.75 for daily permits to $1,032 for the annual permit. The C and Z permits are $4.75 for a daily permit or $375 for the annual permit. Residential permits are priced at the same level as the 'C' permit.

Enforcement

Parking citations are issued in University visitor, commuter and residential lots and Stanford residential areas by the Stanford Department of Public Safety, a division of the Santa Clara County Sherriff's department. Parking tickets range from $45 for a permit violation to $348 for illegally parking in an ADA space.

Stanford covers the cost for enforcement in university parking areas, while all parking ticket revenue is collected and retained by Santa Clara County.

2000 General Use Permit Environmental Impact Report

When Santa Clara County issued the 2000 General Use Permit, there were approximately 19,350 parking spaces on campus. The 2000 General Use Permit Environmental Impact Report (EIR) found that buildout of the 2000 General Use Permit would have a less than significant impact on parking or access to parking. The EIR noted that not providing sufficient parking could result in Stanford commuters parking in surrounding neighborhoods. The EIR also noted that allowing no more than the then-current parking ratio on campus would reduce the degree to which added parking would encourage automobile trips and referenced the Transportation Demand Management program.

The EIR analysis used the following ratios to develop the parking demand under build out of the 2000 General Use Permit:

- Academic parking ratio was 1 space per 1,560 square feet
- Undergraduate and graduate student housing parking ratio was 0.75 per unit
- Postdoc and resident parking was 1.0 space per unit
- Faculty/staff housing parking would be accommodated in the unit, and would be exempt.

The analysis then applied a deduction for the graduate student population that would move onto campus due to new housing that would be provided under the 2000 General Use Permit and also reduced parking supply requirements for an anticipated performing arts center.[1] To balance parking supply and demand, without generating a surplus that would undermine future trip reduction efforts, the EIR concluded that future parking spaces should be limited to 2,267 total spaces (including student residential parking). (Final EIR Vol. 1, page 4.4-83).

[1] The current method for calculating parking demand differs somewhat from the method used in the 2000 General Use Permit EIR; the per square foot and per bed ratios should not be compared directly to one another.

Conditions under the 2000 General Use Permit

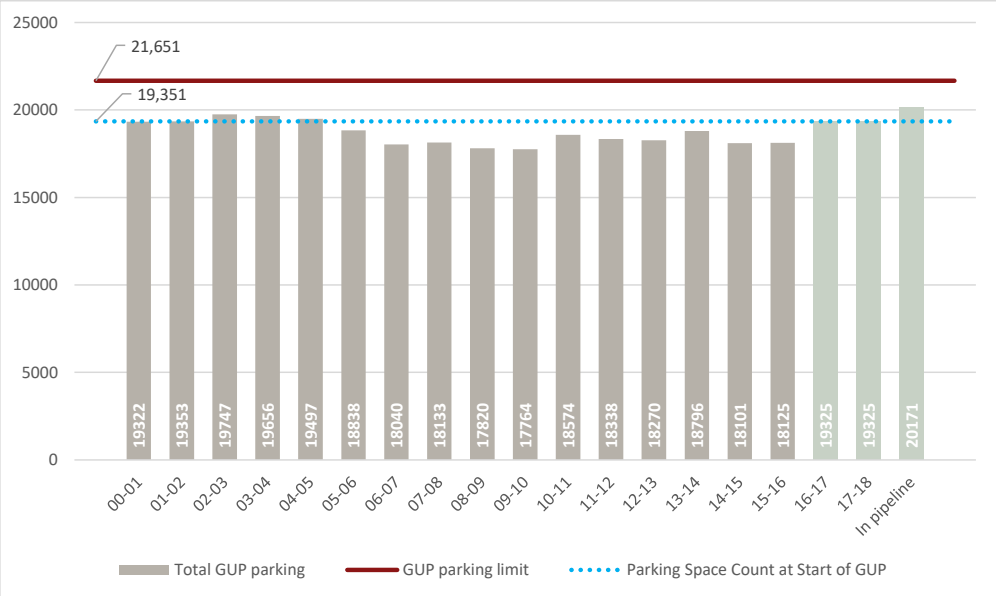
Construction of Net New Parking Spaces and Parking Distribution

The 2000 General Use Permit allows construction of 2,300 net new parking spaces above the then-current campus base of 19,351 spaces for a total of 21,651 spaces. 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 do not count toward these limits (see **Figure 1**).

The 2000 General Use Permit established maximum net additional parking spaces per Development District, subject to modification with an environmental assessment.

As of August 2016, the total supply of parking outside the Campus Residential zoning districts was 18,125 spaces. 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 (see Figure 1). With the parking constructed in association with the Escondido Village Graduate Residences and other development under the 2000 General Use Permit, this total is expected to increase to 20,171, leaving ~~approximately~~ 1,480 spaces remaining under the 2000 General Use Permit authorization.

Figure 1: 2000 General Use Permit Parking Supply and Limit



Commented [JRH9]: Probably not, but is there a reason to say that this is simply the above 2,267 rounded up to 2,300?

Commented [JRH10]: Is the reduction from 19,351 tied to the "new parking structures" that "have largely replaced other parking facilities" (page 3 of memo)?

Commented [PM11]: All the graphs in the paper should have X and Y axis label for clarity of the data.

Parking Demand

Stanford's residential and commuter parking demand has been decreasing on a per student bed and per academic square foot basis due to implementation of Stanford's successful alternative transportation/Transportation Demand Management programs and nationwide trends of reduced vehicle ownership by the student population.

Millennial Travel Preferences

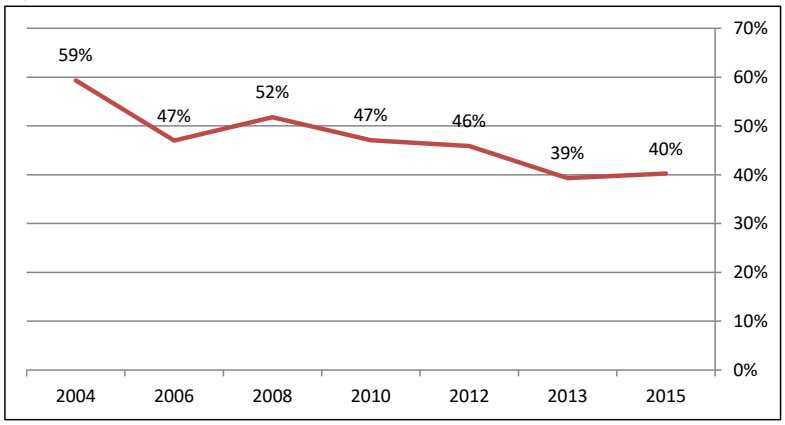
The "millennial" generation is a demographic cohort whose birth years range from the 1980s to the early 2000s. The majority of graduate students matriculating at Stanford for the next 10 years will likely be millennials.

Multiple researchers and media outlets have studied millennials and transportation, focusing on the fact that "automobility" has been declining for millennials and the previous generation, dating back to the 1990s. Noreen C. McDonald, associate professor in the Department of City and Regional Planning at the University of North Carolina at Chapel Hill, addresses this trend in a 2015 paper titled, "Are Millennials really the 'Go-Nowhere' generation?" published in the *Journal of the American Planning Association*. Using data from National Household Travel Surveys, McDonald finds that "automobility declines for all Americans between 1995 and 2009, but the drops are largest for Millennials and younger members of Generation X starting in the late 1990s. Moreover, among young adults, lifestyle-related demographic shifts, including decreased employment, explain 10 to 25 percent of the decrease in driving; millennial-specific factors such as changing attitudes and use of virtual mobility (online shopping, social media) explain 35 to 50 percent of the drop in driving; and the general dampening of travel demand that occurred across all age groups accounts for the remaining 40 percent."

Stanford Graduate Student Mode Shift

National trends in mode and mobility shifts are even more pronounced in Stanford's graduate student population. From 2004 to 2015, commuting graduate students have reduced their drive-alone mode share from approximately 60% to approximately 40% (see **Figure 2**).

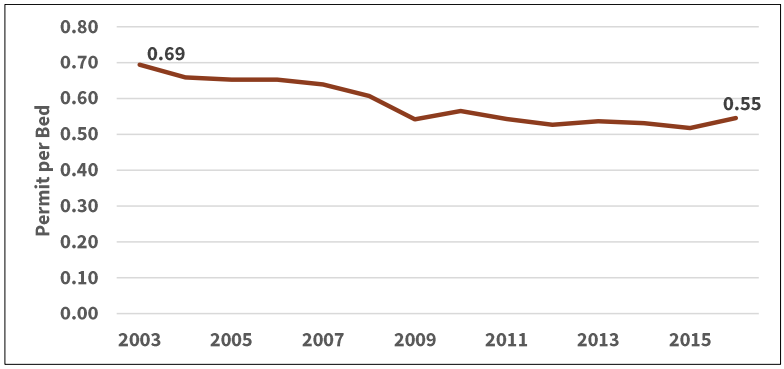
Figure 2: Stanford Graduate Student Drive-Alone Rate



Stanford Residential Parking Permit Trends

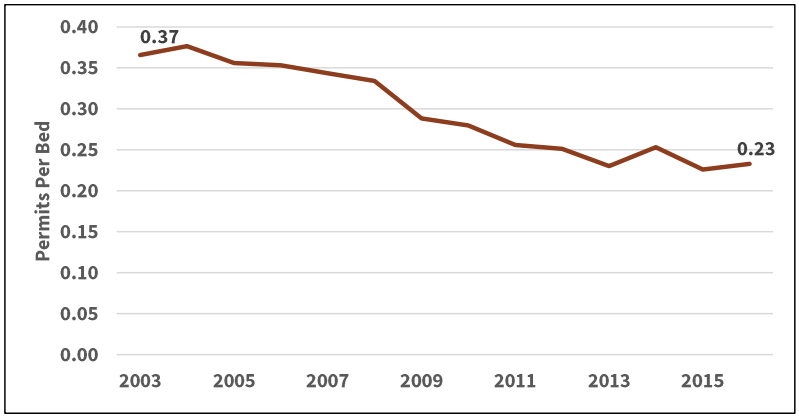
This trend away from personal automobile reliance is also apparent in parking permit sales for Stanford's graduate student residents. Between 2004 and 2015, the total graduate student residential parking permits-to-beds ratio has fallen from 0.69 to 0.55 (see **Figure 3**).

Figure 3: Stanford Graduate Student Parking Permits-to-Beds Ratio



Undergraduate student parking permit sales also declined at a similar rate at Stanford. Between 2003 and 2015, the undergraduate student residential parking permits-to-beds ratio has fallen from 0.37 to 0.23 (see **Figure 4**).

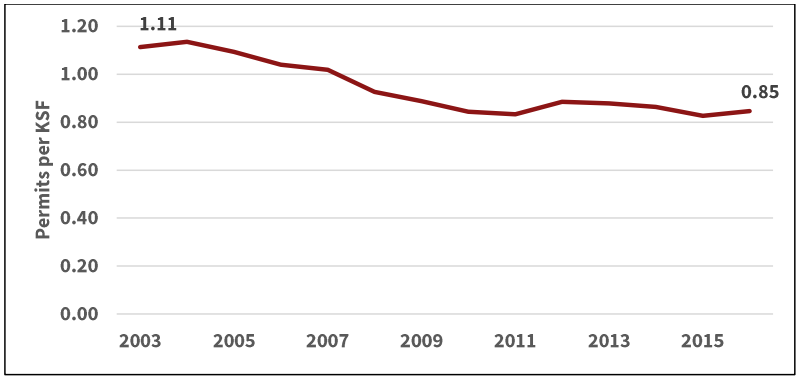
Figure 4: Stanford Undergraduate Parking Permits-to-Beds Ratio



Stanford Commuter Parking Permit Trends

Unlike student permits, commuter permits are not dominated by the millennial generation. Yet Stanford has seen the number of commuter parking permits purchased decline on a per square foot basis, from a rate of 1.11 permits per thousand square feet of academic and academic support facilities in 2003 to a rate of 0.85 permits per thousand square feet in 2015.[2] This decline is likely due to Stanford's successful Transportation Demand Management program, which is designed to reduce the rate of single-occupant vehicle trips and achieve a goal of No Net New Commute Trips. While Stanford saw a significant drop in its commuter permit-per-square-foot rate between 2003 and 2009, this rate has been relatively flat since 2009 (see **Figure 5**).

Figure 5: Stanford Commuter Parking Permits-to-Academic Square Footage Ratio



[2] The 0.85 is the ratio of commuter permits (8,166 permits) sold divided by the academic and academic support facilities square footage (9,462,000 square feet).

Campus Parking Authorization Request

As explained in the preceding sections, Stanford has remained well beneath its 2000 General Use Permit parking allocation for two reasons. One, car ownership by Stanford students has been trending downward. Similarly, 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 transportation demand management 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 requests 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 requests 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. Those 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 (see **Table 1**). 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 1: 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).

Stanford does not seek initial authorization for this parking supply reserve because it seeks to discourage automobile ownership and use. Stanford intends to continue to expand its Transportation Demand Management programs to meet the No Net New Commute Trips goal, 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 requests 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 goal;
- 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 and Palo Alto's Residential Parking Permit Programs

Community outreach for the 2018 General Use Permit has 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 goal 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.

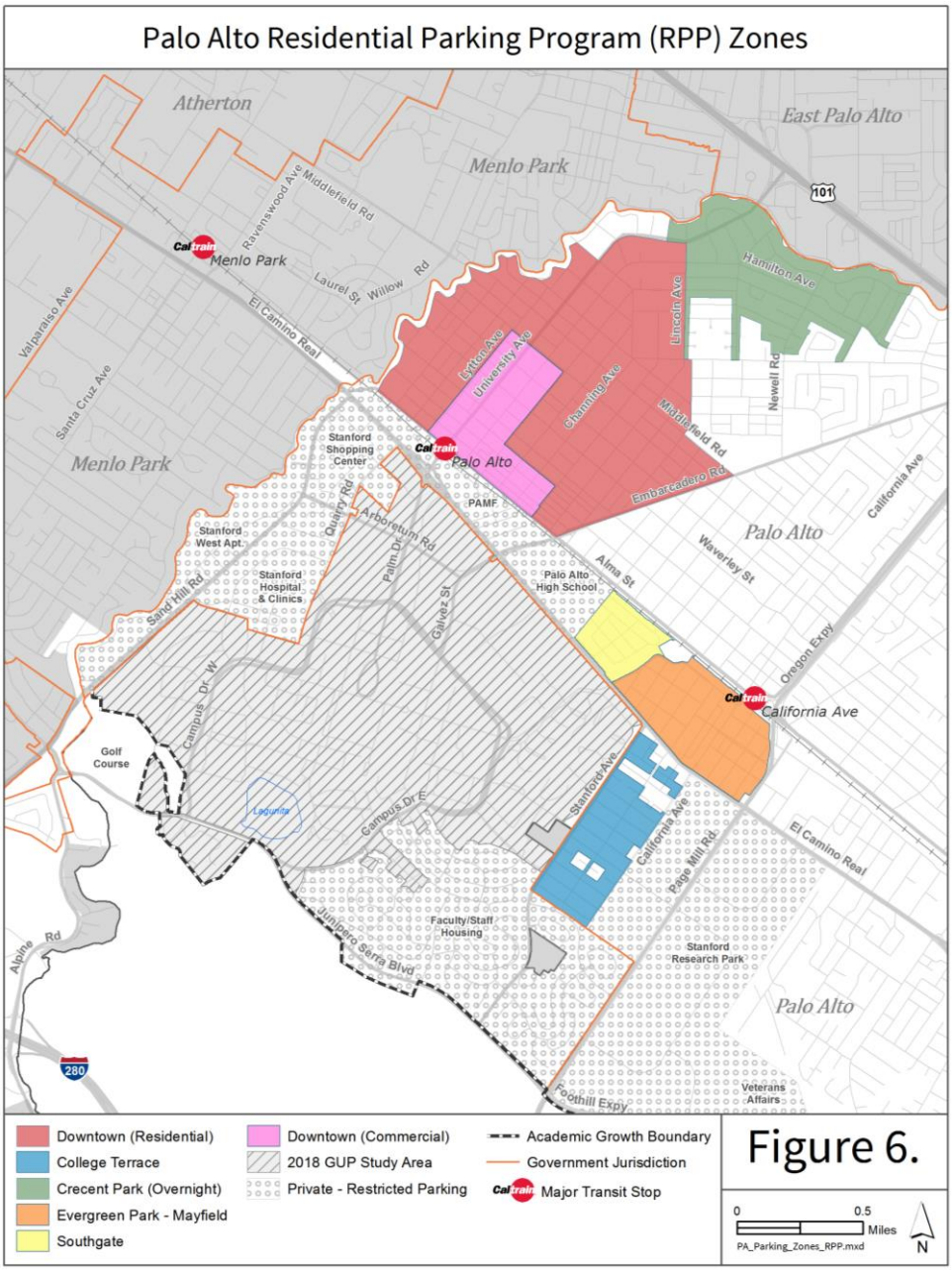
Background

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 is in compliance with this condition as it 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 6**.

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 City Council approved a City-wide Residential Parking Permit (RPP) ordinance to establish uniform procedures to develop RPP districts.

Generally speaking, 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 under consideration (Evergreen Park-Mayfield and Southgate). The Crescent Park neighborhood has an overnight parking restriction.


Palo Alto Residential Parking Program (RPP) Zones
Atherton
Menlo Park
East Palo Alto
Palo Alto
Stanford Research Park
Stanford Shopping Center
Stanford West Apt
Stanford Hospital & Clinics
Palo Alto High School
PAMF
Faculty/Staff Housing
Golf Course
Lagunita
Veterans Affairs
Menlo Park
Palo Alto
California Ave
Ravenswood Ave
Middlefield Rd
Laurel St
Willow Rd
El Camino Real
Valparaiso Ave
Santa Cruz Ave
Lytton Ave
University Ave
Channing Ave
Lincoln Ave
Hamilton Ave
Newell Rd
Middlefield Rd
Embarcadero Rd
California Ave
Waverley St
Alma St
Oregon Expy
Quarry Rd
Arboretum Rd
Palm Dr
Galvez St
Sand Hill Rd
Campus Dr W
Campus Dr E
Stanford Ave
California Ave
Page Mill Rd
El Camino Real
Junipero Serra Blvd
Alpine Rd
Foothill Expy
101
280
Downtown (Residential)
College Terrace
Crecent Park (Overnight)
Evergreen Park - Mayfield
Southgate
Downtown (Commercial)
2018 GUP Study Area
Private - Restricted Parking
Academic Growth Boundary
Government Jurisdiction
Major Transit Stop
Figure 6.
0
0.5
Miles
PA_Parking_Zones_RPP.mxd
N

Downtown Palo Alto Residential Preferential Parking

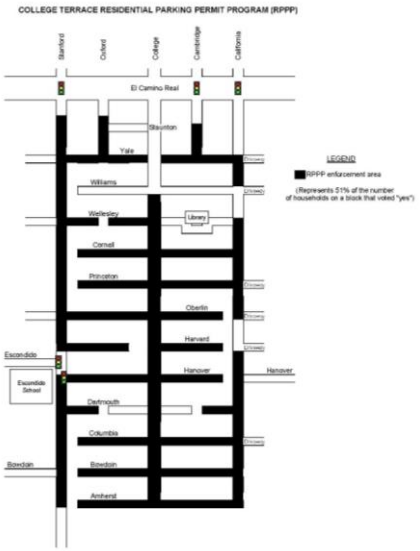
The downtown Palo Alto commercial district has 2-hour on-street parking and 3-hour lot/garage parking restrictions. These time restrictions have caused downtown employee parking to shift into the residential areas surrounding the downtown. To protect the residential neighborhoods, the City passed an ordinance to develop the Downtown Palo Alto Residential Preferential Parking (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 AM and 5 PM, Monday through Friday. The downtown plan covers the area illustrated in the figure to the right.

Residents are eligible for one permit free of charge and up to three additional for $50 each for their personal vehicles. These permits are vehicle-specific decals. Residents may also purchase up to two transferable visitor hangtags for $50 each and up to 50 daily visitor permits for $5 each.

Serco, Inc. has been contracted by the City to provide enforcement services for the Downtown RPP program. Serco employees wear uniforms with identification, and walk, bike, or drive throughout the Downtown RPP district.

College Terrace Residential Parking Permit Program

The College Terrace Residential Parking Permit (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 AM to 5 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.



Each College Terrace resident can purchase up to two reusable guest passes at a cost of $40 per permit. The guest permits are available only for a household that has purchased at least one resident parking permit. This allowance is to provide accessibility for resident services in the neighborhood such as lawn care, house cleaners, contractors, etc., as well as for guests of the household. Guest passes are provided per household rather than per vehicle ownership. Guest passes are designed to hang from the rear view mirror and must be clearly displayed in this fashion. The selling of guest passes is considered illegal under the adopted ordinance. If a resident loses a guest permit, he or she may request a replacement at a cost of $40 but this is restricted to a one-time replacement per program year.

Day permits may be purchased in person at the Revenue Collections office. Day permits will be applicable for one 24-hour period. At the time of purchase, the date of purchase of each day permit will be logged in a registry at the Revenue Collections office based on the number of the day permit. A fee of $5 will be charged for each day permit. Day passes are be designed to hang from the rear view mirror and allow the user to scratch off the day of usage, which must be clearly displayed. The total number of day permits issued will be limited to 20 day passes for each quarter that the College Terrace RPP applies.

Construction and maintenance permits will be available for long-term construction activities, consistent with current practice by the City.

In addition, all vehicles not displaying a permit, may park up to 2 hours during these specified time periods. Vehicles not displaying a permit, during these specified time periods and exceeding the 2-hour maximum parking allowance are cited by the City of Palo Alto Police Department.

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 AM and 5 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.

Each resident will receive their first permit for free, with remaining permits costing $50 dollars each, with up to three permits per household. There would only be 250 parking permits for employees, with an annual of cost $149, though low-income workers would get a discounted rate of $50.

Southgate RPP

The Southgate neighborhood began its process for an RPP in July 2016 with the idea that the implementation would be in June 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 AM to 1 PM is being considered.

Crescent Park No Overnight Parking

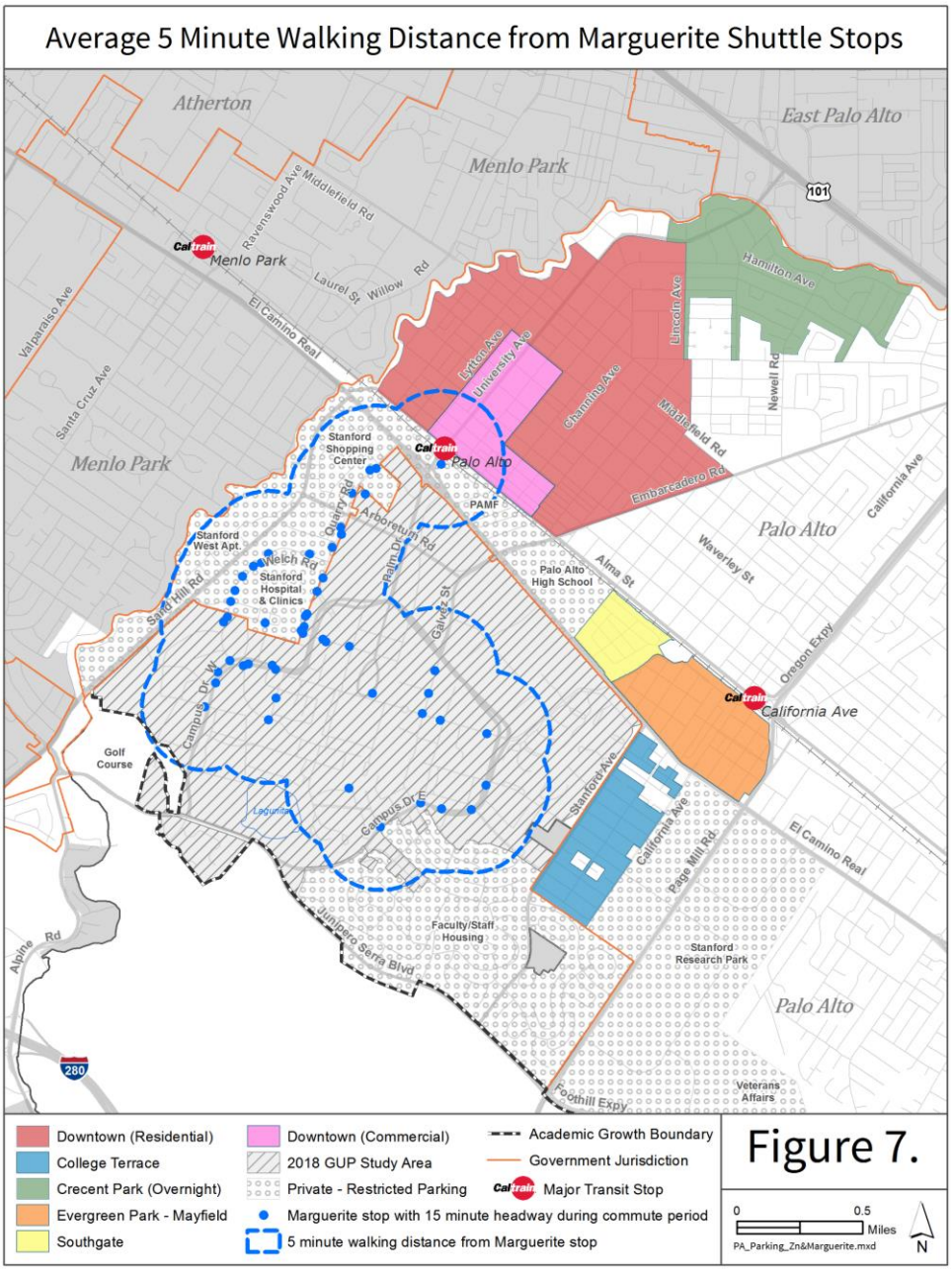
The Crescent Park No Overnight Parking program was initiated in September 2015 as a response to resident concerns about non-Palo Alto residents parking within the neighborhood. A no-overnight restriction was implemented to eliminate parking from outside sources. The Crescent Park RPP includes the area 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 AM to 5 AM. Only residents of streets within the program boundaries are eligible to purchase permits. Residents are allowed up to two annual permits per household at a cost of $100 each. Permits were sold at various times of the year and permits purchased after the initial 6-months of the program were sold at a prorated basis.

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 7** 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 RRP areas cover the neighborhoods where accessing a Marguerite stop would be most likely to occur. The RRPs are expected to prevent parking in these neighborhoods; anecdotal observations to the contrary may pre-date initiation of the RRPs. 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 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.


Average 5 Minute Walking Distance from Marguerite Shuttle Stops
Atherton
Menlo Park
East Palo Alto
Palo Alto
Ravenswood Ave
Middlefield Rd
Menlo Park
Laurel St
Willow Rd
El Camino Real
Valparaiso Ave
Santa Cruz Ave
101
Hamilton Ave
Lincoln Ave
Lytton Ave
University Ave
Channing Ave
Middlefield Rd
Newell Rd
Embarcadero Rd
California Ave
Stanford Shopping Center
Palo Alto
PAMF
Arboretum Rd
Palm Dr
Galvez St
Stanford West Apt.
Quarry Rd
Welch Rd
Stanford Hospital & Clinics
Sand Hill Rd
Palo Alto High School
Alma St
Waverley St
Oregon Expy
California Ave
Campus Dr W
Golf Course
Lagunita
Campus Dr E
Stanford Ave
California Ave
Page Mill Rd
El Camino Real
Alpine Rd
Junipero Serra Blvd
Faculty/Staff Housing
Stanford Research Park
Palo Alto
280
Foothill Expy
Veterans Affairs
Downtown (Residential)
College Terrace
Crecent Park (Overnight)
Evergreen Park - Mayfield
Southgate
Downtown (Commercial)
2018 GUP Study Area
Private - Restricted Parking
Marguerite stop with 15 minute headway during commute period
5 minute walking distance from Marguerite stop
Academic Growth Boundary
Government Jurisdiction
Major Transit Stop
Figure 7.
0
0.5
Miles
PA_Parking_Zn&Marguerite.mxd
N

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 8-9 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.

Conclusion

In sum, Stanford's proposal for the 2018 General Use Permit attempts to balance the need to accommodate demand with a desire not to over-park the campus such that it would be more difficult to achieve the No Net New Commute Trips goal. Stanford's proposal to live within the parking authorization from the 2000 General Use Permit reflects its plan to further reduce parking rates for commuters and residents. The proposed parking reserve is intended to be used only in the event Stanford is meeting the No Net New Commute Trips goal, Stanford needs to provide additional parking for purpose that is not likely to increase peak hour commute trips, or unforeseen circumstances occur due to changes in background conditions. The parking reserve is sized to match parking demand based on current per square foot and per bed rates.

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

memorandum

date January 25, 2019

to David Rader, Senior Planner
Santa Clara County Department of Planning and Development

from Brian Boxer, Paul Mitchell and Amber Grady - ESA

subject **Summary of ESA Peer Review of 2018 General Use Permit Application-Historic Resources Report**

As part of the 2018 General Use Permit application, Stanford prepared and submitted a Historic Resources Report (Report) in support of, and related to, the proposed 2018 General Use Permit. The Report contains an evaluation of all structures located within the Stanford Community Plan's Academic Campus land use designation that were constructed prior to 1976. At the request of the County, ESA conducted an independent peer review of this report to verify the technical accuracy of the information, and identify any apparent deficiencies, errors and omissions affecting the completeness, methodologies, findings and adequacies of the report. The ultimate goal of the peer review was to help ensure that the information contained in the report met accepted professional standards for use in the EIR.

Amber Grady, an ESA Senior Architectural Historian, reviewed the Historic Resources Survey Report in 2017. Meetings were held in April and July of 2017 following each review, with the report being revised by Stanford in May 2017 to address the April 2017 comments. The following summarizes the comments, broken out by those two time periods.

April 2017

There are a few overall comments/suggestions that are followed by more detailed comments that are in chronological order as they appeared in the report.

Overall Comments/Suggestions

- Throughout the Historic Setting as buildings are initially described it would help the reader if a note was added with regards to their current condition (e.g., extant, demolished). Starting on page 11.34.

- The context by which the buildings are evaluated is too narrowly defined. It appears that the buildings are being evaluated as part of a historic district within the narrowly defined context of "collegiate architecture in the San Francisco Bay Area." This is insufficient to make a determination of ineligibility.

- While the inventory forms include a statement that the subject resource is not eligible under Criteria 1 and 2 it provides no supporting information for this claim. Beginning in the last paragraph on page 11.6 the survey team's approach to focusing on Criteria 3 is explained stating "Criteria 1 and 2 (association with significant events or significant persons) are challenging to apply consistently in the context of a major research university." Unfortunately, just because something might prove difficult that is not sufficient justification under CEQA to not do the analysis. On page 11.7 it goes on to elaborate on the quality and quantity of scholars and professionals that have been associated with Stanford emphasizing the scope of the effort of evaluating 400+ buildings under Criteria 1 and 2. Additionally, the last paragraph of page 11.7 states that "We chose instead to acknowledge the communal association between all members of the Stanford community and the iconic campus architecture we intend to preserve." This statement seems to be the beginnings of an argument to say that all Stanford buildings are significant under Criteria 1 and 2 for their associations. CEQA requires that historic resources are identified so that the potential significant impacts under a given project can be analyzed and disclosed to the public. Since this is a programmatic document we have the option of requiring further study as part of our mitigation strategy if that approach is acceptable to the County and Stanford. Otherwise, all of the historic-age buildings and structures need to be evaluated under all four criteria.

Page 11.3

- Include Stanford Driving Range, Searsville and Olmsted staff housing subdivisions, and Gardiner Apartments on one of the maps and refer to it.

Page 11.4 – bulleted list under Review of Prior Historic Resources Evaluations

- Provide #s for bulleted information – "A handful of properties…" and "Several buildings…"

Page 11.6 – Academic Property Types

- What does "AC" stand for? Example "AC-T/R"

Page 11.15 – second paragraph

- Capitalize "Adobe" when used as a proper name "Buelna-Rodriquez Adobe"
- Capitalize "Reservoir" in "Lagunita Reservoir."

Page 11.17

- Refer reader to Figure 2.3 on page 11.25 or move map to the front of this section on Pioneer Settlers. It will help orient the reader.

Page 11.19 – third paragraph

- Capitalize "Railroad" in "San Francisco to San Jose Railroad."

Page 11.26 – first paragraph

- Capitalize "Farm" in "…former Hoag Farm…"

Page 11.50 – second and third paragraphs

- Typo – looks like these paragraphs should be merged.

Page 11.105

- Romance of the West – starts in 1925 or 1926?

Page 11.113

- Should the timeframe of "Mid-Century Modern and the Post-War Campus (1951-1975) match that on Table 1.1 for "Regional Modernism"? 1950-1974? Should the titles match as well? All of the other Themes from Table 1.1 match the titles in this section.

Page 11.182

- Title seems like it should be "Theme: Regional Modernism (1950-1974)."

Appendix A

- Suggested including a small plan view map for larger buildings that have multiple phases/additions. It will help the reader visualize the changes.
- Some of the descriptions lack cardinal directions, which would help orient the reader.
- It seems like the "Name" section is used for "Common Name" and the "Historic/Common Name" section is really used for the Historic Names. Is this correct? If so, suggest changing section name from "Historic/Common Name" to just "Historic Name."
- Many of the "Description" sections seem to include some analysis of significance as well. Suggest moving all analysis to the "2017 Evaluation" section of the form.
- Stanford building 02-500:
    - This is one of those descriptions that would benefit from a plan view map.
    - List those characteristics in the "Description" that support the style classification. This building was classified as Richardsonian Romanesque with Mission Influence, but the evaluation says "…property lacks important characteristics of Richardsonian Romanesque with Mission Influence collegiate architecture." Move last paragraph of "Description" down to "2017 Evaluation" to provide the additional language needed to support this statement. Also, if it isn't considered an excellent example then state that here.

- Stanford building 02-520:
    - This is one of those descriptions that would benefit from a plan view map.
    - Third paragraph of the "Description" says "…transitional building that marked a shift in style…" What styles? Also, move this paragraph to the "2017 Evaluation" section.
- Stanford building 02-530:
    - Same comments as 02-500.
- Stanford building 02-550:
    - Same comments as 02-500.

May 2017

In general, revisions to the report made in response to peer review comments and Stanford staff-initiated changes included, but were not limited to:

- Report revised to include an expanded discussion of Criteria 1 and 2: Significance for association with events or persons important in history.
- Findings was updated to reflect the new findings for Criteria 1 and 2 presented in Chapter 1.
- Appendix A (Survey Forms) was updated throughout to consolidate evaluation of criteria 1, 2 and 3 in a single section and to reflect the new findings under criteria 1 and 2.
- Appendix B (DPR Forms) was revised to reflect the findings under criteria 1 and 2 for the six collegiate properties found eligible for more than one criterion.
- Appendix C (Non-collegiate properties) was revised to reflect the findings under criteria 1 and 2 for two agricultural properties found eligible for more than one criterion.

Overall Comments/Suggestions

- Criteria 1 and 2 analyses – suggest emphasizing/clarifying that "high standard" or threshold that was used, due to the high number of accomplished persons that are associated with the university, to determine eligibility of resources under Criteria 1 and 2. This is needed to strengthen the argument for eligibility or ineligibility under Criteria 1 and 2.

AECOM
300 California Street, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	ESA: Paul Mitchell	Pages	2
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of the Forecasting Approach for the Stanford 2018 General Use Permit Traffic Impact Analysis and Fehr and Peers (F&P)/Stanford's responses to AECOM comments		
rom	AECOM: Nichole Seow, Greg Gleichman, and Lilia Scott		
Date	April 19, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] AECOM submited comments on Fehr & Peers' memo "Forecasting Approach for the Stanford 2018 General Use Permit Traffic Impact Analysis" dated December 16, 2016 on February 4, 2017. Fehr and Peers (F&P)'s response/update was dated March 21, 2017. Our February memo contained the following request for formal review of model assumptions:

> *To avoid the extra cost and time of additional model runs, it would be helpful and time efficient for AECOM to review, as part of the peer review process, the network and land use assumptions before key model scenarios are run. We are requesting that F&P prepare a series of brief interim memos for our review, which will provide more detail on the activities referenced here:*
>
> ** indicates the need to peer review the response before the existing conditions model run.*
>
> *** indicates the need to peer review the response following the existing conditions model run.*
>
> **** indicates the need to peer review the response before the near-term no project model run.*
>
> ***** indicates the need to peer review the response before the cumulative no project model run.*
>
> *No "*" indicates the need for a source or clarification.*

Described below are AECOM's comments on the March 21, 2017 memos. Our peer review comments on other parts of the 2018 GUP Application are being or have been submitted separately.

[1] This language is from the scope of work in the AECOM contract for this project.

Stanford GUP 2018 Application
Peer Review Comments on Forecasting Approach memos

	Section	Page	Description	Comments
1	Overview of Forecast Approach	2	Analysis scenarios	AECOM believes that an additional scenario was added: 2020 with the completion and occupancy of Escondido Village Project. Explain which of the described scenarios includes these conditions or why the scenario is left out. This issue was addressed in the 4/26/17 meeting and subsequent phone call on 5/2/17; however, it still needs to be clarified in the document.
2	Forecasting Process	3	1st paragraph (last sentence) states that Table 2 includes a summary of the data for the validated GUP model	AECOM believes F&P means not "Data" but "Model Performance results". Suggest editing to reference correct word given the content of the Table.
3	Forecasting Process	4	Near –Term With Project and Cumulative With Project Models	Clarify when it will be "needed" to manually assign Stanford trips. This issue was addressed in the 4/26/17 meeting and subsequent phone call on 5/2/17; however, it still needs to be clarified in the document.
4	Forecasting Process	4	Near –Term With Project and Cumulative With Project Models	The reference to page 27 of TIA Part 1 is incorrect. Page 27 of TIA Part 1 is Figure 5 for Employee Mode Share. Update reference.
5	Overall	NA	Overall	Our previous peer review memo (dated 2/4/2017) included an outline of requested technical responses. Provide a summary outlining when AECOM can expect to review the full list of Forecasting Approach deliverables by model run.

AECOM
Post Montgomery Center
One Montgomery Street
Suite 900
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	Paul Mitchell, ESA	Pages	6
For	Santa Clara County, David Rader and Kavitha Kumar		
Subject	Peer Review of the 2018 General Use Permit review of Transportation Impact Analysis (TIA) (Tab 7) sections 1 and 2 and Appendix A only		
From	Lilia Scott, Nichole Seow and Greg Gleichman, AECOM		
Date	February 2, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted in Stanford's General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1]

Described below are AECOM's comments on the 2018 General Use Permit review of the Transportation Impact Analysis (TIA) (Tab 7) Sections 1 and 2 and Appendix A of the Application only. We previously submitted our comments on Sections 3 and 4 and Appendix B on December 16, 2016. We will submit our comments on Tab 9, Vehicle Miles Traveled and the Forecasting Approach separately. The table below displays our specific comments on the document.

Stanford GUP 2018 Application
Peer Review Comments on the Transportation Impact Analysis (Tab 7) – Sections 1 and 2 and Appendix A

Comment #	Section	Page	Document Content	AECOM Comment
1	1	3	2nd & 3rd paragraphs – mention of the 16 gateway roadways, 8 parking structures (1 is under construction) and surface parking lots	F&P should provide location maps (or list) showing the 16 roadways and parking areas. Suggest adding the monitoring maps. Also, given that parking structures are under construction at the time of writing, this description should include the date when the parking structures are to be open and available for use.
2	1	4	"The baseline is the measurement of the volume of inbound trips during the peak hour of the AM commute period (7:00 AM – 9:00 AM) and the volume of outbound trips during the	In the Monitoring Report, the "peak hours" are determined for each monitoring interval based on the highest level of traffic volumes. They are not at a set time. Suggest correcting sentence.

[1] This language is pulled from the scope in our contract for this project.

Comment #	Section	Page	Document Content	AECOM Comment
			peak hour of the PM commute period (4:00 PM – 6:00 PM)."	
3	1	4 - 5	"The trip credit is commensurate with … the proportion of the cost of the program that Stanford is contributing"	This reference to the "proportion of the cost" is included in the 2000 GUP, but we do not see it in any of the methodology documents. AECOM wonders if it should be mentioned here since it isn't part of the implementation of the concept.
4	1	5	"Trip reduction must occur in the area between US 101, Valparaiso Avenue/ Sand Hill Road, Interstate 280, and Arastradero Road/ Charleston Road."	According to the map Angus Davul provided to County staff on 4/24/13, this description is not entirely correct. It should be rewritten as follows "US 101, Marsh Rd / MiddleField / Valparaiso Avenue continuing directly to the intersection of Sand Hill Road and Interstate 280 / I-280, and Arastradero Road / Charleston Road".
6	1	5	"Each year the total inbound AM peak hour trips and outbound PM peak hour trips, as modified by the trip reduction credits, are compared to the 2001 baseline to establish compliance."	Stanford has not reported Trip Credits every year of traffic monitoring. While annual tabulations of the credits are important for tracking purposes, the County has directed that the Trip Credits are only applied as needed when the volumes exceed the baseline.
7	1	6	"Since the performance of the TDM program is monitored by the annual cordon counts, no single aspect of the TDM program is specified in the 2000 GUP."	Traffic is monitored with the cordon counts. Stanford monitors its TDM Program. See comment #12.
8	1	6	"Subsidized carpools and vanpools with expanded rideshare matching"	Vanpools are clearly indicated as subsidized on the website, but carpools are only "subsidized" to the extent of the $12.50/month "Carpool Credit" which appears to be more of an "incentive" than a "subsidy". In addition, it is unclear what is meant by the text "expanded rideshare matching". How is it "expanded"?

Comment #	Section	Page	Document Content	AECOM Comment
9	2	6	"Extensive promotional campaigns offering cash rewards and prizes"	"Extensive" is a value judgement; and generally is not found in an environmental review document. AECOM suggests removing that word.
10	2	6	"A commute buddy program"	Unable to find the commute buddy program on the website. https://transportation.stanford.edu/CommuteBuddy/. This a broken link.
11	2	6	"Free carshare memberships"	Membership does not appear to be "free" to everyone at Stanford. It appears to be $15 for the first year and $25 for subsequent years, and free for Stanford Departments only per the website found at https://transportation.stanford.edu/zipcar-stanford Suggest clarifying who gets a free membership.
12	2	6	Last paragraph states that the "TDM program has successfully maintained the AM and PM peak-hour traffic volumes below the 2001 baseline volume".	Correlation does not necessarily equal causation. F&P should rephrase for accuracy. Instead, we suggest "During Stanford's Transportation program implementation, AM and PM peak-hour traffic volumes have remained at or below the 2001 baseline volumes."
13	2	6	"In 2002, the drive alone rate for Stanford employees was 72%; as the TDM program expanded, the drive-alone rate has decreased to around 50%."	F&P should include the response rates for each of these surveys (number and percentage, and methodology) Survey participation is (currently?) self-selected. So, it's entirely possible this decrease is the result of a change in survey participation. In any case, it is recommended to cite sample sizes and mention limitations (such as error ranges for random-sample surveys).
14	2	7	"Bicycle program which includes peer-to-peer support, safety education, financial incentives, a bicycle website and "bike speak": a community based	AECOM is not able to locate any link or evidence of the "peer-to-peer support" or the "'bike speak': a community based information exchange website". It is assumed that new students or employees

Comment #	Section	Page	Document Content	AECOM Comment
			information exchange website."	may struggle to find them as well. Suggest verifying and removing this language.
15	2	7	"Commute buddy which matches experienced transit and bike commuters with new alternative transportation commuters"	As noted earlier, the commute buddy program appears to have been cancelled. Suggest verifying and removing this language or verifying program status.
16	2	7	"Tiered parking pricing and monitoring technology"	AECOM could not find any reference to monitoring technology on the website or in our work on Stanford. Please verify that this program exists and rephrase for clarity.
17	2	7	"On-site amenities: food services, banking, etc. that eliminate midday trips"	Amenities do not "eliminate" midday trips; amenities may "reduce" the need for them. Suggest changing language to say "reduce the need for" instead of "eliminate".
18	2	7	"Car share rental credits for non-driving commuters"	Suggest "Car share rental credits for employees who did not bring a car to work"
19	2	8	"Source: Fehr & Peers, July 2015. Figure 2: Historical Drive-Alone Mode Share Source: Stanford Parking & Transportation Services, 2015"	The two cited sources are a bit confusing and need to be more specific. Likewise, request inclusion of total population and # of responses each year. Somewhere in the document, we suggest including a brief discussion of credible interval of the data based on response rates, total population and methodology, but it doesn't need to be here. It can be a footnote.
20	2	9	"The most recent survey was sent to over 50,000 individuals and had 20,725 responses (~41%)."	As noted in the previous comment, the document should include discussion on the credible interval based on the methodology, number of responses, and total population, someplace in the document.
21	2	9	2nd paragraph mentions the 2015 annual transportation survey being used	F&P should explain why the report uses 2015 data instead of more recent data (we presume it is for consistency, i.e., 2015 is most recent year where a full data set is available).
22	2	10	"Approximately 20 percent of commuters bike to campus."	The source of statistics should always be cited including any

Comment #	Section	Page	Document Content	AECOM Comment
				limitations to the data.
23	Appendix A	1	1st paragraph states that a large portion of Stanford students and employees live within 3-5 miles of campus	State this proportion and the source of the data.
24	A	1	2nd and 3rd paragraphs	AECOM was unable to identify any biking groups, buddies or peer-to-peer exchange forums on the website. Suggest verifying and rewriting.
25	A	2	"shower rentals"	AECOM believes this is a typo. The Stanford's website appeared to indicate that lockers are by rental while shower access would be free to employees and students. F&P should confirm this.
26	A	2	"Bicycle Rental" section	This section appears to describe a formal bike sharing system. While the Campus Bike Shop does offer same-day rentals, the intent described on the website appears to be more focused on helping beginning bicycle commuters who are not ready to purchase their own bike rather than a formal bikesharing transportation system. Suggest rewriting.
27	A	4	"Financial incentives can motivate people to use alternative modes by offsetting the financial cost of using those modes to provide a greater financial gain for the employee."	So called "alternative modes" (walking, biking, riding public transit or ridesharing) are less expensive than the mode that they are considered an "alternative" to: driving alone. Financial incentives do not "offset" commute costs – they provide an additional advantage that commuters may find more tangible. The sentence in the application should be re-written for accuracy as described in the sentence above.
28	A	4	"People who join the Commute Club and rideshare are eligible for carpool credit (1)to partially offset the cost of a carpool permit (2). Each member of the carpool is eligible for up to $150 of credit. (4)	1) Since the "Carpool Credit" is not a direct subtraction from the permit price, it appears to be more of an incentive than a subsidy. F&P should call it an "incentive" and not a "subsidy".

Comment #	Section	Page	Document Content	AECOM Comment
			Additionally members of the Commute Club are eligible for up to $102 per year in Zipcar driving credits and up to 12 free hourly car rental vouchers for use with Enterprise."	2) Is the "Carpool Credit" limited to two participants as implied on the website? "Receive $300 in Carpool Credit toward the cost of your carpool permit …" Please clarify in application. https://transportation.stanford.edu/rideshare/learn-about-carpooling/benefits-carpooling 3) Including ridesharing and on-campus car rentals in the same section is confusing since they are different programs that cater to different needs. Suggest separating.
29	A	4	"In 2014 prizes valued at over $10,000…."	AECOM suggests using more recent data than 2014. The following sentence (not quoted) appears to be in present tense when it should be in past tense.
30	A	4	"Financial Incentives" section	Suggest adding the "Clear Air Cash" program here. Also, Stanford pays the vanpool leases – this is also a financial incentive / subsidy not included here. Suggest adding the vanpool incentives to this section.
31	A	5	"bountiful resources"	Marketing language may not be appropriate in an environmental review document. Suggest rewriting with a more objective tone.
32	A	5 & 6	"Commute Buddy"	Again, program appears defunct. Suggest verifying or removing reference to it.
33	A	7	Telecommuting/Flexible work Schedule Program	Suggest including data on this project and its success rates in reducing trips (with citation of course).

AECOM
300 California Street, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	Paul Mitchell, ESA	Pages	3
For	Santa Clara County, David Rader and Kavitha Kumar		
Subject	AECOM Peer Review of Fehr & Peers' memo "Forecasting Approach for the Stanford 2018 General Use Permit Traffic Impact Analysis" dated December 16, 2016		
From	Greg Gleichman, Lilia Scott and Nichole Seow, AECOM		
Date	February 4, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted in the 2018 General Use Permit application to verify that the processes or analyses follow generally acceptable transportation planning practices, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] We have reviewed each document in a separate memo. Below please find AECOM's comments on Fehr & Peers' memo "Forecasting Approach for the Stanford 2018 General Use Permit Traffic Impact Analysis" dated December 16, 2016.

The table below displays AECOM's line-by-line comments on F&P's Forecasting Approach memo. To avoid the extra cost and time of additional model runs, it would be helpful and time efficient for AECOM to review, as part of the peer review process, the network and land use assumptions before key model scenarios are run. We are requesting that F&P prepare a series of brief interim memos for our review, which will provide more detail on the activities referenced here:

* indicates the need to peer review the response before the existing conditions model run.
** indicates the need to peer review the response following the existing conditions model run.
*** indicates the need to peer review the response before the near-term no project model run.
**** indicates the need to peer review the response before the cumulative no project model run.
No "*" indicates the need for a source or clarification.

Stanford 2018 General Use Permit Application
Peer Review Comments on the Forecasting Approach memo

Comment #	Page	F&P Memo Content	AECOM Comment
1	1	"We will incorporate the Stanford data into the VTA model to produce intersection turn movement forecasts and freeway mainline volume forecasts within the study area, for the following scenarios:"	Please reference a specific source document for the Stanford data.

[1] This language is from the scope in our contract for this project.

Comment #	Page	F&P Memo Content	AECOM Comment
2	2	"• Near-Term Conditions (2018 with the completion of the existing 2000 GUP and other local approved projects which would be built and fully occupied by fall 2018);"	***AECOM looks forward to reviewing the assumed near term land use conditions. We expect that F&P would list the parts of the 2000 GUP that are assumed to be constructed between now and 2018. One specific example: F&P should say if they are assuming the Escondido Village housing project is complete by then or what portion of it is assumed to be complete in the memo.
3	2	"The updates to the coding may include, but are not limited to, items such as roadway widening/narrowing and transit enhancements."	*We look forward to reviewing F&P's documentation of these updates.
4	2	"Our land use review will include a review of the land use within the Stanford University traffic analysis zones (TAZs), as well as a review of land use totals within the surrounding jurisdictions against the Association of Bay Area Governments (ABAG) Projections 2013 estimates."	*AECOM looks forward to reviewing F&P's adjustments of TAZ land use. This review will make sure we are in agreement before F&P begins the model runs.
5	2	"We will compare the model's estimates of existing traffic volumes at study area intersections with recent 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."	**This sounds like a good approach.We look forward to peer reviewing the available data so we can confirm we are in agreement about the adjustments.
6	2-3	"We will adjust the land uses in the cities of Palo Alto, East Palo Alto, and Menlo Park to reflect information about approved projects that would be built and fully occupied by fall 2018, provided by those jurisdictions…."	*** We request that the specifics of these updates be documented, including the basis for each update, and provided in a form to allow for our peer review, prior to running the 2018 no project conditions.
7	3	"We will also review the 2020 model network improvements."	***We request that any adjustments to the model network be documented for our peer review prior to running the near-term no project scenario. Some examples of what may or may not be included are BRT systems, Caltrain

Comment #	Page	F&P Memo Content	AECOM Comment
			electrification, and new BART stations.
8	3	"To represent Cumulative No Project conditions, the Stanford University special generator trips will be increased to reflect the growth anticipated between now and 2018, to represent growth that is approved under the current 2000 GUP, as described in TIA: Part 1."	****How will it be increased? Please provide a more specific description of this action and how it will be done. Also, please specifically reference the relevant TIA part 1 section(s) by page number.
9	3	"We will run the models, review the results for reasonableness…"	***F&P should define what is meant by "reasonableness" in clear and specific terms. Is there a set of criteria for consistency and accountability? In addition, what are the criteria or tolerance levels for the model to be considered acceptable?
10	3	"(This information is described in TIA: Part 1.)"	F&P should provide the page number(s) so the content they are referencing can be easily located and cross-checked.
11	3-4	"Fehr & Peers will review the forecast results for reasonableness, including checks at the campus gateways to ensure the input trip generation matches the net external trip generation."	****AECOM appreciates this example of reviewing for "reasonableness", but we would like to review a complete list of what is to be checked. We also would like more explanation of what this particular check is for; whether it is about trip pass through (why would trips be lost midway?) or if the assumption is that all trips are round trips even through the model only represents peak period travel.

AECOM
300 California Street
Suite 600
San Francisco, CA 94104
www.aecom.com

415. 796.8100 tel
415. 796.8201 fax

Memorandum

To	ESA: Paul Mitchell	Pages	3
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) Transportation Impact Analysis (TIA) part 2 only		
From	AECOM: Nichole Seow, Lilia Scott, and Greg Gleichman		
Date	February 27, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1]

Described below are AECOM's comments on the 2018 General Use Permit (GUP) Transportation Impact Analysis (TIA) part 2 of the Application only. Our peer review comments on other parts of the 2018 GUP Application are being or have been submitted separately.

Stanford 2018 GUP Application
Peer Review Comments on the Transportation Impact Analysis Part 2

Comment #	Section	Page	Description	Comments
1	1.2.1	3	Study intersections	The current "final" list of intersections is selected based on the trip distribution presented in the 2018 GUP Application TIA part 1. Peer review comments on the TIA part 1 analysis remain unresolved. As such, the list of intersections may change or additional intersections may be added once the trip distribution step is revised based on the peer review.
2	3.3	37	Freeway ramps	Add existing conditions on freeway ramps to this section, particularly metered on-ramps.
3	3.6.2	42	Analysis methods, pedestrian facilities	HCM has defined methods for evaluating pedestrian facilities.

[1] This language is from the scope of work in our contract for this project.

Comment #	Section	Page	Description	Comments
				Include a discussion of the available pedestrian evaluation methodology including HCM's and why the one used for this project was selected.
4		43	Streetscore+	Provide this tool so that we can peer review it as part of this process as required.
5	4.3	50	Existing Intersection Operations - study intersections List	Provide missing information for the intersection of St Francis Dr. / Embarcadero.
6	4.4	56	Santa Clara County Freeway Segments - Table 4-2 Existing Freeway Segment LOS in Santa Clara County	Update Table 4-2 to include 2 HOV lanes on US101 between SR 85 and San Antonio Road.
7	4.7	80	Field Observations - 2nd paragraph states that cycle length and intersection phasing were observed at all study intersections	Cycle lengths cannot technically be observed for actuated intersections. State if the field reviewers obtained the data prior to field observation. Also, clarify if the field observation was to verify information or was it was to collect this data.
8	-	-	Parking	Recommend adding a discussion of existing conditions as they relate to parking
9	Attachment A (Study Intersection Selection Criteria)	1	Last paragraph states "excluding the roadways in downtown Palo Alto between Alma Street and Middlefield Road".	Explain why these intersections were not included.
10	Attachment A (Study Intersection Selection Criteria)	1	States: "Based on the trip generation, distribution and assignment, over 125 intersections were identified using the 10 net new trips per lane rule"	Peer review comments on the TIA part 1 remain unresolved. As previously mentioned, intersection assignment could change after our peer review comments have been integrated into the part 1 analysis. Revisit after the TIA part 1 is revised based on peer review. For example, more project traffic is expected to use Central

Comment #	Section	Page	Description	Comments
				Expressway than currently estimated by the F&P/Stanford. As a result, additional intersections on Central Expressway could meet the selection criteria when the trip distribution is revised. The same could be said of Marsh Road. Include the scoring sheet in Appendix A.
11	Appendix C (Study Intersection LOS Calculations)		Traffix output	Several intersections were analyzed separately (e.g. I-280/Sand Hill, ECR/University, I-280/Alpine). Confirm that these intersections are actually operating separately. Otherwise, analyze them as one.
12				We also noticed that the analysis did not consider some right-turn movements at several intersections. For example, right-turn from NB I-280 to EB Alpine, right-turn from WB Alpine to NB I-280, and right-turn from EB University to SB ECR, just to name a few. Many of these right-turn movements are expected to carry project trips in the future. Explain why the right-turns were not included.
13				Provide back-up documentation to substantiate the signal timing used in analysis (e.g. 170s for AM ECR/University or 105s for PM Sand Hill/NB I-280 Ramps).

AECOM
300 California Street
Suite 600
San Francisco, CA 94104
www.aecom.com

415. 796.8100 tel
415. 796.8201 fax

Memorandum

To	ESA: Paul Mitchell	Pages	3
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford 2018 General Use Permit (GUP) Neighborhood Street Assessment		
From	AECOM: Nichole Seow, Lilia Scott, and Greg Gleichman		
Date	February 27, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) Application to verify that the documents follow generally-acceptable transportation planning practices, address the appropriate technical study areas, and use methodologies that are clear and replicable.[1]

Described below are AECOM's comments on the 2018 GUP Application Neighborhood Street Assessment, including a discussion of neighborhood street network/traffic existing conditions as well as impacts using the TIRE index[2]. Our peer review comments on other parts of the 2018 GUP Application are being or have been submitted separately.

Stanford 2018 GUP Application
Peer Review Comments on Neighborhood Street Assessment

Comment #	Section	Page	Description	Comments
1		3	Section regarding the selection of neighborhoods for analysis	We agree with the two neighborhoods, College Terrace and Crescent Park, selected in Palo Alto. However, provide further explanation as to why University Heights in Menlo Park was not selected. Also, include a map displaying all local neighborhoods for added clarity on the selection process.
2	TIRE indices on local streets	9	Following sentence in 1st paragraph: Based on the Vehicle Miles Traveled (VMT) analysis, the 2018 GUP would be expected to generate 18,930	Provide the source of this number, so that it can be verified. We cross-referenced the VMT appendices and did not conclude the same total.

[1] This language is from the scope of work in our contract for this project.
[2] The TIRE index refers to the Traffic Infusion on Residential Environment methodology, which is used by the City of Palo Alto to determine traffic impacts on residential streets.

			additional daily trips at the completion of development.	
3	College Terrace TIRE Analysis	9	3rd paragraph	Confirmed that Bowdoin Street represents 9.5% of total all-day trips in both directions crossing the Stanford cordon from the 2016 Stanford Traffic Monitoring. Suggest a text change from “10%” to either “about 10%” or “9.5%”.
4	College Terrace TIRE Analysis	9	Last paragraph	Provide details/methodology regarding how the 795 daily trips are obtained. Our peer review did not replicate this number.
5	College Terrace TIRE Analysis	10	20% cut-through traffic assumed	Provide basis for 20% assumed cut-through traffic. Note for comparison: campus cut-through traffic averaged 14% in the 2016 Stanford Traffic Monitoring.
6	College Terrace TIRE Analysis	11	Table 1	Provide details/methodology regarding how the project daily trips on the roadway segments are obtained. We had insufficient information to replicate this calculation for peer review purposes. Also, provide a Table 2 equivalent for this neighborhood and respective details regarding the analysis process.
7	Crescent Park TIRE Analysis	11	2nd paragraph regarding the application of the 4% trip distribution to University Avenue	As the proposed trip distribution has not been revised based on peer review comments, the 4% used may be subject to change. Note that this may need to be revised once part 1 of the TIA is revised based on our peer review.
8	Crescent Park TIRE Analysis	12	Table 2	The estimated project daily trips of 757 is subject to change pending revisions based on peer review comments of the trip distribution. Note that this may need to be revised once part 1 of the TIA is revised based on our peer review.
9	Crescent Park TIRE	12	Table 3	Regarding the TIRE Index for Hamilton Avenue, between

	Analysis			Middlefield Road and Fulton Street, per Table A-1, an ADT of 5,580 equates to a TIRE Index of 3.7.
10	Crescent Park TIRE Analysis	12	Tables 2 and 3	Provide a description of your analysis process. We were able to figure it out, but the description of this process needs to be easier to understand than the current description provides.
11			ADT count	As part of an appendix, include raw hose (or video?) count sheets of all roadway ADT used in calculation, description of the collection methodology (dates, times, technology, etc) and how the counts were translated to the ADT used.

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	ESA: Paul Mitchell	Pages	10
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) Application, Tab 8, Transportation: Vehicle Miles Traveled		
From	AECOM: Lilia Scott, Nichole Seow, and Greg Gleichman		
Date	March 10, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] We have reviewed each document in a separate memo. Below please find AECOM's comments on 2018 General Use Permit review of *Tab 8, Transportation: Vehicle Miles Traveled* only. Our peer review comments on other parts of the 2018 GUP Application are being or have been submitted separately.

Stanford GUP 2018 Application
Transportation: Vehicle Miles Traveled (Tab 8) Review Comments

Comment #	Section	Page	Application Content	AECOM Comment
1	All	All	All	Use "daily VMT per capita" throughout for clarity.
2	Populations Included in the Analysis	6	"Figure 1 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. Transit services are provided by Stanford (Marguerite), Caltrain, VTA, Sam Trans and Dumbarton Express. The figure demonstrates that 99 percent of the proposed new development is within a 1/2 mile of a major transit stop or a stop along a major transit	AECOM conducted a detailed assessment of the transit services provided in the vicinity of Stanford University, and while we disagree with some of the technical findings outlined in this paragraph and Figure 1, the general concept is valid. This figure and text should be modified to reflect OPR's intent of major transit stops and high quality transit corridors. We believe that the Palo Alto Transit Center is correctly identified as a major transit stop. The El Camino Real Corridor is consistent with the

[1] This language is from the scope of work in the AECOM contract for this project.

Comment #	Section	Page	Application Content	AECOM Comment
			corridor."	definition of a high quality transit corridor. By applying the ½ mile criteria, the Corridor coverage includes the Stanford campus approximately as far as Campus Drive where it is parallel with El Camino Real. This approximate boundary assumes direct pedestrian access from El Camino Real to the campus is included as part of the project design. Figure 1 calls out Transit Priority Areas (TPAs) along Marguerite lines. TPAs are only around major transit stops. The term is not used in the revised OPR Guidelines or Technical Advisory and should not be used here. For buses, a major transit stop only occurs if two or more major bus routes intersect, both having 15 minute headways or less. Though this might happen some places in the Marguerite network, it is difficult to characterized Marguerite routes as major. Figure 1 should be revised to be consistent with the high quality transit corridor definition. However, several Marguerite routes may qualify for the OPR definition of a high quality transit corridor. These could include Line P service to the Oval/Serra Mall stop and Line MC stops serving the Lucas Center on Welch Road. Recommend that this matter be explored further with the County before a final

Comment #	Section	Page	Application Content	AECOM Comment
				determination is made.
3	Numeric Significance Thresholds for 2018 GUP	8	Table 1 – N/A Santa Clara County Home Based Work (HBW) VMT per Worker	OPR's Advisory describes creating an apples-to-apples comparison where the baseline comes from the same data sources as the projected impacts – using the same type of model and the same geographic foundation.[2] As such: Change the Baseline to be the 2015 Existing Conditions daily VMT per person in Tables 5 and 6 multiplied by 0.85.
4	Numeric Significance Thresholds for 2018 GUP	8	"Where a travel demand model is used to estimate thresholds, the same model should also be used to estimate trip lengths as part of estimating project VMT." (pg III:16 of the Technical Advisory, 1/20/16)	The application's approach of using the VTA model's regional daily VMT per capita to calculate the threshold and Stanford data to calculate project VMT is not consistent with OPR's direction (see quote to the left). The Advisory recommend an apples-to-apples comparison of results calculated using the same method.
5	Numeric Significance Thresholds for 2018 GUP	9	2nd paragraph	Delete "workers without students" discussion as it serves no purpose.
6	Numeric Significance Thresholds for 2018 GUP	9		The analysis appears to focus on commute trips. AECOM suggests that the OPR intended for the VMT per person to be the daily total. Suggest adding a discussion of all-day trips – Stanford campus, with its many amenities, may benefit from this expanded approach.
7	Methodology for Calculating	10+	Methodology for Calculating 2018 GUP VMT	Include a discussion of available methodologies and

[2] Unincorporated areas in Santa Clara County are rural, which is a completely different context than Stanford University.

Comment #	Section	Page	Application Content	AECOM Comment
	2018 GUP VMT			why the system selected was most appropriate. For example, VTA's Transportation Impact Analysis (TIA) Guidelines (adopted October 2014) lists several trip generation methodologies in Appendix D. Include this in the TIA part 1, Trip Generation as part of the revision to the analysis based on AECOM's peer review of the first draft of the TIA report which AECOM submitted December 16, 2016.
8	Methodology for Calculating 2018 GUP VMT	10	Last 2 paragraphs	AECOM needs to see the work and sources cited to conduct our peer review. Provide a table comparison, memo or technical appendix so AECOM may complete its peer review on this data.
9	Methodology for Calculating 2018 GUP VMT	10	Last paragraph mentions the use of "VTA's methodologies for calculating the project VMT" were used.	Provide specific document reference (name, date, weblink if available).
10	Methodology for Calculating 2018 GUP VMT	11	"Visitors are not included in the populations that OPR recommends for evaluation in comparison to the SB 743 significance thresholds, and therefore the visitor VMT is not included in this analysis."	AECOM's review of the OPR Advisory is not consistent with this statement. Reference "office projects that feature a customer component" (pg III:16 of the Technical Advisory, 1/20/16): Stanford University receives many visitors throughout the year for its academic, research and sporting-events activities. The OPR Technical Advisory states that office developments that feature a customer component, as Stanford does, are to use the methodology for retail development. Add this component to the analysis.
11	Methodology for	12	"VMT would increase to	Move this discussion of VMT

Comment #	Section	Page	Application Content	AECOM Comment
	Calculating 2018 GUP VMT		some extent because the ratio of graduate student housing to undergraduate student housing would shift toward a higher proportion of graduate student housing, which has a higher VMT per resident than undergraduate student housing. Some spouses of graduate students would have home-based work trips off-campus and both the graduate students and spouses would have home-based-other trips."	impacts to page 23, Fall 2035 Campus VMT Generation, and add specific ratios for reference.
12	Campus Population	14	Table 4	Note 3 has a typo "graduate" twice when one should presumably be "undergraduate". Note 4 – suggest combining these groups throughout the document for consistency. Suggest putting the categories in a consistent order throughout the document (Table 3 and 4 have different orders). Graduate student affiliates Fall 2018 to Fall 2035 number appears incorrect based on other numbers in table. Note 5 – could not find reference on page 6.
13	General methodology for Counting VMT	15	"The most recent survey had a response rate of 35%."	Tab 7, page 9 stated that the most recent survey had a response rate of 41%. Verify/explain this difference.
14	General methodology for Counting VMT	15	3rd paragraph – mentions that F&P adjusted the Stanford data	It is not clear why the adjustments were necessary. Provide details of the adjustments. Provide these numbers or reference in a table if the details are provided elsewhere

Comment #	Section	Page	Application Content	AECOM Comment
				in the application.
15	General methodology for Counting VMT	15	4th paragraph states that site specific assumptions were made regarding the frequency, length and mode of HBW trips.	Provide more details of the assumptions used. Provide these numbers or reference in a table if the details are provided elsewhere in the application..
16	General methodology for Counting VMT	16	"12 categories of workers"	Explain the 12 categories and how they are used in this analysis. Reference Appendix A.
17	Worker VMT	17	US Census Journey to Work data was used in determining commute mode and vehicle occupancy	State year and geography of data used. AECOM needs to be able to verify these sources and have the ability to replicate the analysis.
18	Worker VMT	17	"Stanford's surveyed drive-alone rate for employees and students living off-campus is around 50% (1) which substantially reduces the amount of vehicle miles traveled compared to all workers in the county with a drive-alone rate of 77% (2). For third party contractors, janitorial contractors and construction contractors, the auto mode split was assumed to be 87% (3) (drive alone, carpool, and vanpool) based on the US Census Journey to Work data."	1) Discuss limitations and potential error in the survey results. 2) Include year of data. 3) Provide citation and how this number was derived from the census and from which year of data. Explain the relationship between 3rd party contractors, janitorial and the transportation survey here. Another indication of the need for a deeper discussion of the survey and how it can and should best used.
19	Worker VMT	17	Vehicle Occupancy	Need to show work and sources: survey and which census year and geography used.
20	Worker VMT	17	Trip Length	This process should have also been the source of the baseline. Also, show work, describe source of data, and any limitations. When the census is used, need to state year and geography used as well as showing work, etc. as stated in

Comment #	Section	Page	Application Content	AECOM Comment
				comment 17 and elsewhere.
21	Worker VMT	17	Calculation on the second half of the page	Reference Appendix A where we believe this equation is used. Confirm equation is correct as displayed here – the slash may be a typo.
22	Worker VMT	17	Trip Length section	Unclear why mode choice is discussed under the trip length section. Remove this language or explain its inclusion.
23	Worker VMT	18	Assuming all Freshmen are single (not in a marriage or domestic partnership)	Provide data to support this assertion.
24	Residential VMT	18	HBW vs Home Based Other (HBO) Trips	Provide detail on how the HBW % for graduate student households (3%) and undergrad students (0%) are obtained. Are these the percent of total trips per person? (For undergraduates, are there no internship work trips that would require students to work off campus at the very least? 0% seems unrealistic.) As mentioned above, baseline is existing conditions from this spreadsheet model (not county data from the VTA model). Need to show work.
25	Residential VMT	20	"The origin / destination data are collected one day per week during the eight week period. The origin / destination data are used to determine the number of trips that pass through the campus without an origin or destination within the campus. Pass through trips include patients using the medical center, patrons of the shopping center, and drivers using the campus roadways to access the surrounding communities."	Revise for accuracy. AECOM staff is not sure what this means, and we do not believe it represents an accurate description of the monitoring process. AECOM staff assumes F&P is talking about the license plate matching, which have no origin / destination component. It is also not relevant to speculate who the pass through traffic is. The other component of the traffic monitoring is the parking permit counts, where the trip

Comment #	Section	Page	Application Content	AECOM Comment
				purpose (e.g. hospital) is relevant – perhaps the application writer has confused the two activities.
26	Daily Vehicle Trip Validation	20-21	Paragraph which overlaps the pages	Show work of how these percentages were derived. The peer review requires we replicate the process to confirm its accuracy.
27	FALL 2015 CAMPUS VMT GENERATION	21	Fall 2015	State why 2015 was used and not a more-recent year.
28	SB 743 Evaluation Conclusions	25	Tables 9 & 10	Check all the numbers presented in the tables. Numbers do not appear to match other tables in the report. For example, Table 6, Workers (including students)/VMT = 168,160 which appears that it should match Table 9, 2018 Workers/VMT: 168,010 but doesn't match. This is one example of several observations. AECOM staff disagrees with the assumptions going into the threshold of significance – the local baseline (for residents) should be Stanford or Palo Alto, not the county. Finally, calling this section "SB 743…" is misleading and inaccurate. The Senate Bill 743 does not provide specific direction on how to calculate VMT. The Technical Advisory does – and it is just that, and "advisory" with recommendations (which this analysis has only loosely followed – we believe the analysis could follow the Advisory more closely for an outcome more consistent with

Comment #	Section	Page	Application Content	AECOM Comment
				OPR's intent). Change the subheading for accuracy.
29	Appendices		Page and Table numbers	Number both pages (with the appendix letter) and tables.
30	Appendices		1st Table: Population and VMT Summary	Clarify "Source Tab" so we can verify content.
31	Appendices		2nd Table: Worker / Student Commute VMT (HBW)	Define "Faculty Subdivision". Define all rows. Some rows are categories of people and some are developments – change categories to be consistent.
32	Appendices		2nd Table: Worker / Student Commute VMT (HBW)	Add visitors to VMT analysis per OPR Technical Advisory directions.
33	Appendices		2nd Table: Worker / Student Commute VMT (HBW)	Column D: cite survey limitations
34	Appendices		2nd Table: Worker / Student Commute VMT (HBW)	Spell out all acronyms once per section LUEP (never spelled out) IRDS (never spelled out) CHTS (spelled out earlier, but not in the appendices)
35	Appendices		3rd Table: Resident Daily VMT	Provide source of how the different daily trip rates for the various population groups used in this calculation (Appendix A, Resident Daily VMT Table, Col D) are derived. They should be traceable to the TIA part 1, but we did not find the reference in either document.
36	Appendices		4th table	Differentiate this table from first table in its title. Visitors VMT here – add this data to the narrative and results. Define sources so they can be verified.
37	Appendices		5th table	Include "other trips" in narrative and results.
38	General Comment			Somewhere in the document, include a discussion on VMT impacts from auto access to transit. The Hospital

Comment #	Section	Page	Application Content	AECOM Comment
				Environmental Impact Report (EIR) included an analysis of this issue. Stanford workers are more likely to do this than the population as a whole given the robust connections to Caltrain and the high cost of housing in Palo Alto.

AECOM
300 California Street
Suite 600
San Francisco, CA 94104
www.aecom.com

415. 796.8100 tel
415. 796.8201 fax

Memorandum

To	ESA: Paul Mitchell	Pages	6
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) Transportation Impact Analysis (TIA) Part 1 and Fehr and Peers (F&P)/Stanford's responses to AECOM comments		
rom	AECOM: Greg Gleichman, Nichole Seow, and Lilia Scott		
Date	April 7, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] The initial submission in November 2016 contained insufficient information to complete a peer review. This peer review memo represents AECOM's first-round review of Fehr & Peers' (F&P) Transportation Impact Analysis (TIA) for Stanford's 2018 GUP, having been provided information on the analysis in March 2017. However, it also includes additional information requests to complete the peer review.

Described below are AECOM's comments on the 2018 GUP Transportation Impact Analysis (TIA) part 1 of the Application and Fehr & Peers' responses to our comments previously submitted. Our peer review comments on other parts of the 2018 GUP Application are being or have been submitted separately.

[1] This language is from the scope of work in the AECOM contract for this project.

#	Section	Page	Description	Comments
1	Attachment 1, F&P responses	Comments 13, 19, 20, and analysis in general	Responses	Some resources include: https://www.aapor.org/getattachment/Education-Resources/For-Researchers/AAPOR_Guidance_Nonprob_Precision_042216.pdf.aspx https://www.aapor.org/Communications/Press-Releases/Understanding-a-credibility-interval%E2%80%9D-and-how-it-d.aspx https://www. ncbi.nlm. nih.gov/pmc/articles/PMC4115258/ Note that this type is data is generally used for marketing and opinion research, not the prediction of future behaviors. F&P needs to include a discussion of data limitations. One possibility is to fill in the data with the census results.
2	Attachment 1, F&P responses	Comment #22	Revised sentence stated " Based on Stanford's 2016 Transportation Survey, approximately 22 percent of all commuters bike to campus;"	Suggest using the year 2015 for consistency.
3	Tech Memo – Stanford 2018 GUP: Peak Hour Trip Generation Analysis Methodology, dated 2/28/2017	3	Second bullet on the page	Typo: "estimating" should be "estimated". Appendix A of the Stanford Traffic Monitoring report contains the peak-hour, off-peak-direction data. Extrapolating these totals is not necessary and introduces unnecessary error into the analysis. In addition, AECOM recommends using a consistent year for analysis, in this case, 2015 has been consistently used. AECOM would be happy to provide these results for F&P upon requests. Update these numbers to accurately reflect both the available data and the unified analysis year used.

#	Section	Page	Description	Comments
4	Tech Memo – Stanford 2018 GUP: Peak Hour Trip Generation Analysis Methodology, dated 2/28/2017	Attachment 1, Worksheet 4	"student resident rate development"	Survey validity – see comment #1 above. Provide a copy of the survey instrument and methodology. AECOM staff was under the impression that spouses/significant others do not respond to the survey. Therefore, it is not clear how the proportion of graduation students vs. spouses/significant others could be derived from the survey. Regarding internal vs. external trips, AECOM requests additional information on this factor. We need to know that these ratios represent AUTOMOBILE trips only. It seems highly unlikely that 58% (135 AM peak hour trips) and 20% (77 PM peak hour trips) of graduate student AUTOMOBILE trips are going from one part of campus to another given the limited parking opportunities on campus.
5	Tech Memo – Stanford 2018 GUP: Peak Hour Trip Generation Analysis Methodology, dated 2/28/2017	Attachment 1, Worksheet 5	Rates per Unit (Home-based rates, Total trips)	Clarify how the peak hour in / out trip rates were obtained. Provide an example of the calculation. Explain why any observed auto trips can be assumed to be internal trips.
6	Tech Memo – Stanford 2018 GUP: Peak Hour Trip Generation Analysis Methodology, dated 2/28/2017	Attachment 2, Worksheet 2 and 3		See comment #3, extrapolating peak hour, off-peak direction is not necessary given available data. Also, use a consistent analysis year (2015).
7	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	1	Last sentence – survey responses	Cite year of data. Is it 2016?
8	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	2	Step 1 – Mapping of Data Sets Paragraph 1	State the number of respondents (range?) who lived outside the greater Bay Area to substantiate that it is a "small" number as described.

#	Section	Page	Description	Comments
9	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	3	First sentence	As F&P, Stanford and AECOM have all previously stated, self-selected data is never statistically significant. Explain why 50 responses was determined to be significant, and the context for this statement (i.e., it only applies to sizing the zones assuming that the data from the transportation survey is the best that can be obtained).
10	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	3	Step 2 – Adjustment for CAC Participation, Last paragraph	State what the statistics package "R" is. Explain process.
11	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	5	Figure 2 – Commute Trip Distribution Analysis Zones - Local	Since this figure is meant to show the local zones (i.e., too small to show on Figure 1 – Regional), AECOM recommends not including regional rates also. This creates confusion. Zoom in more to show local context rather than regional.
12	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	7 and 8	Table 1	Cite source of the data. Is it the survey?

#	Section	Page	Description	Comments
13	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	11	Table 3	Based on the road hierarchy and proximity to Stanford, more trips from • "Mountain View North of Central Expressway" should be assigned to Central Expressway than El Camino Real (ECR). Similarly, more trips from • "Santa Clara, Sunnyvale, North San Jose" should be using Central Expressway than US 101 which is already congested in the prevailing directions. Memo from Rocelia Kmak/GF, Santa Clara County Roads and Airports dated Dec 19, 2017 also states: "Prior to commencement of work on the EIR and TIA, the following comments on the Trip Generation and Trip Distribution shall be addressed: A. "The trip distribution on Central Expressway does not consider the effects of congestion and ramp metering on the use of US 101. Central Expressway is parallel with US 101 and connects San Jose up to Palo Alto where it changes to Alma Street. Many users divert to Central Expressway due to the congestion on US 101. Assigning only 1%-2% project trips on Central Expressway is inadequate."
14	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	12	Stanford Resident Methodology	Provide the data (e.g. flow tables) obtained for the Census tracts used in the calculations described.
15	Tech Memo – Stanford 2018 GUP: Trip Distribution Analysis Methodology, dated 2/24/2017	17	Table 5	Trips going to Santa Clara and Sunnyvale should have assignments on Central Expressway and not only on the freeways and ECR.

#	Section	Page	Description	Comments
16	Attachment 6, Stanford Onsite Childcare, 3/3/2017			Employees and residents transporting children tend to have different mode splits than those who are not. Provide the current ratio of childcare spaces to total employees / residents and the proposed future ratio Discuss any impact a change in ratio may have on transportation impacts.
17	Revised TIA	11	Annual Transportation Survey	F&P needs to add one or more paragraphs to TIA Part 1, following the first paragraph of the ANNUAL TRANSPORTATION SURVEY section. This new text should explain the difference between a self-selected survey and a random sample survey, alternatives to using the self-selected survey, advantages and disadvantages of the self-elected survey method and its alternatives, and why Stanford/F&P deemed a self-selected survey to be adequate for the purposes of the TIA. Issues that should be noted in the new text include: 1) The number of responses to the transportation survey and how this exceeds the number of responses that would be collected in a random sample survey 2) The potential for bias in a self-selected survey, a description of analysis that was done to identify bias in the transportation survey, and their findings. (AECOM presumes Stanford looked for bias because they apparently found the CAC bias and corrected for it.) 3) The potential for random sample surveys to also have bias issues.
18	Revised TIA, Trip Generation Growth: 2015 to Fall 2018 (Commencement of Proposed 2018 GUP) and 2015 to 2020 (Full Build out of 2018 GUP	18	"Therefore, if Stanford were to apply to build more than the up to 550 faculty/staff housing units proposed in the 2018 GUP application , additional traffic analysis would be warranted."	The County reserves the right to request an Access and Circulation Report on all proposed developments regardless of their inclusion in the GUP Revise this sentence to reflect the correct process.

#	Section	Page	Description	Comments
19	Revised TIA, Trip Generation Growth: 2015 to Fall 2018 (Commencement of Proposed 2018 GUP) and 2015 to 2020 (Full Build out of 2018 GUP	20	Tables 3B and beyond	Starting on page 20, all the tables referenced in the text were incorrect. Update the table numberings to match the text as it is almost impossible to follow given the incorrect table numbers.
20	Revised TIA, Trip Distribution	28 and 32	Tables 9 and 10 (of TIA Part 1)	Tables 9 and 10 did not include 'Central Expressway' under the 'Roadway' column. If ECR, Alpine, Sand Hill and Santa Cruz are listed, by road hierarchy, Central Expressway should be included as it's hierarchy is higher (just like Foothill, Embarcadero, all are expressways). Clarify why Central Expressway was not included in these tables.
21	Revised TIA, Appendix A , Stanford TD, Program	4	Traffic Calming and Roundabouts	Clarify the opening date of the 4th roundabout, currently stated as fall 2016. Is it fall 2017?
22	Revised TIA, Appendix A, Stanford TDM Program	11 and 12	Figure 1, Marguerite Shuttle System and Transit Services	The second Figure 1 (on Page 12) appears to be a blow-up of the Marguerite services of the Stanford Area. Suggest using a different Figure # and Title and clarify in the text. It is confusing to have 2 separate figures with the same Title and Figure # with no explanation. Also, the figures need a Legend to tell the reader what the different colors for transit lines signify.

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	ESA: Paul Mitchell	Pages	14
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) Application, Tab 8, Transportation: Vehicle Miles Traveled and Fehr & Peers March 21, 2017 Memo "Stanford 2018 GUP Daily Trips – VMT Validation/Calibration and Projections"		
From	AECOM: Lilia Scott, Nichole Seow, and Greg Gleichman		
Date	May 24, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1] We submitted the original comments 1 through 38 on Tab 8 of the 2018 GUP Application on March 10, 2017. The ones of those comments that have been addressed are indicated as such in this memo. AECOM has carried over any of those comments that were not addressed in the revised submission.

[1] This language is from the scope of work in the AECOM contract for this project.

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

Stanford GUP 2018 Application
Transportation: Vehicle Miles Traveled (Tab 8) Review Comments

Comment #	Section	Page	Application Content	AECOM Comment March 10, 2017	F&P Response May 4, 2017	AECOM Response May 24, 2017
1, 3, 6, 8, 9, 11, 10, 12, 14-17, 19-38						AECOM considers these comments resolved (or they are further addressed in the form of new comments based on the new text).
2	Tab 8: Populations Included in the Analysis	6-7	"Figure 1 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. Transit services are provided by Stanford (Marguerite), Caltrain, VTA, Sam Trans and Dumbarton Express. The figure demonstrates that 99 percent of the proposed new development is within a 1/2 mile of a major transit stop or a stop along a major transit corridor."	AECOM conducted a detailed assessment of the transit services provided in the vicinity of Stanford University, and while we disagree with some of the technical findings outlined in this paragraph and Figure 1, the general concept is valid. This figure and text should be modified to reflect OPR's intent of major transit stops and high quality transit corridors. We believe that the Palo Alto Transit Center is correctly identified as a major transit stop. The El Camino Real Corridor is consistent with the definition of a high quality transit corridor. By applying the ½ mile criteria, the Corridor coverage includes the Stanford campus approximately as far as Campus Drive where it is parallel with El Camino Real. This approximate boundary assumes direct pedestrian access from El Camino Real to the campus is included as part of the project design. Figure 1 calls out Transit Priority Areas (TPAs) along the Marguerite lines. TPAs are only around major transit stops. The term is not used in the revised OPR Guidelines or Technical Advisory and should not be used here. For buses, a major transit stop only occurs if two or more major	The figure has been revised as follows: The Caltrain stations have been labeled major transit stops. Per Public Resources Code section 21064.3, a major transit stop is a site containing an existing rail station. The El Camino corridor has been labeled a high quality transit corridor. Per Public Resources Code section 21155, a high quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. The Marguerite bus routes with service intervals no longer than 15 minutes during peak commute hours also have been labeled high quality transit corridors. The figure depicts a 1/2 mile radius around major transit stops and high quality transit corridors.	The map update does not appear to be correct for the Marguerite shuttle. Most Marguerite routes do not have frequencies of 15 minutes or less during peak commute hours. According to Stanford's website, https://transportation.stanford.edu/marguerite, the weekday routes have the following frequencies (frequency data is quoted from each route's main page): 1050 Arastradero: Every 20 to 25 minutes Line AE-F: In the morning, the shuttle departs to Stanford from Fremont BART station at 5:25 a.m., 5:35 a.m., 5:50 a.m., 6:06 a.m., 6:18 a.m., 6:50 a.m., and 7:26 a.m. In the afternoon, the shuttle originates from Stock Farm Garage, departing to Fremont at 3:25 p.m., 3:55 p.m., 4:25 p.m., 4:55 p.m. and 6:25 p.m. Bohannon: Every 10 to 30 minutes Line C: Every 30 minutes from 5:35 a.m. to 9:22 p.m. East Bay Express: It operates Monday through Friday (including university holidays), with only one bus run per morning (4:50 a.m. departure from Fremont BART station) and evening (11:42 p.m. departure from the Oval). * **Hospital: Direct**: 4 am - 9 am: 8-15 minutes; 9 am - 2 pm: 15-17 minutes; 2 pm - 6 pm: 7-10 minutes; 6 pm - 1 am: 15-17 minutes * **Medical Center**: Every 15 to 20 minutes. Line N: Every 40 minutes Line O: Every 40 minutes Oak Creek Apartments: Every 20 minutes * **Line P**: Line P A.M: Every 10 minutes Monday through Friday (excluding university holidays). Line P P.M: Every 10 minutes Monday through Friday (excluding university holidays). Research Park: Every 20 to 40 minutes. Line S: Every 45 to 55 minutes. Shopping Express: Every 50 to 60 minutes. SLAC: Every 30 minutes. VA: Every 25 minutes from 6:40 a.m. to 5:30 p.m. Line X (Counter-Clockwise): Every 20 minutes from 5:53 A.M. to 9:10 P.M. Every 20 minutes from 5:53 A.M. to 9:10 P.M. https://transportation.stanford.edu/marguerite/x

Comment #	Section	Page	Application Content	AECOM Comment March 10, 2017	F&P Response May 4, 2017	AECOM Response May 24, 2017
				bus routes intersect, with both having 15 minute headways or less. Though this might happen some places in the Marguerite network, it is difficult to characterized Marguerite routes as major. Figure 1 should be revised to be consistent with the high quality transit corridor definition. However, several Marguerite routes may qualify for the OPR definition of a high quality transit corridor. These could include Line P service to the Oval/Serra Mall stop and Line MC stops serving the Lucas Center on Welch Road. Recommend that this matter be explored further with the County before a final		Line Y (Clockwise): Every 20 minutes Monday through Friday (except university holidays), 6:13 A.M. to 9:10 P.M. https://transportation.stanford.edu/marguerite/y As shown, the routes with 15 minute or better frequencies during the peak hours include the Hospital Direct, Medical Center, and the Line P only. They are indicated with an "*" and made bold above. No other Marguerite routes meet the criteria according to Stanford University. Note in particular that the Lines X and Y run at 20 minute frequencies which does not meet the criteria. The last sentence on page 6 incorrectly refers to "major transit corridors".
4	Tab 8: Numeric Significance Thresholds for 2018 GUP	8	"Where a travel demand model is used to estimate thresholds, the same model should also be used to estimate trip lengths as part of estimating project VMT." (pg III:16 of the Technical Advisory, 1/20/16)	The application's approach of using the VTA model's regional daily VMT per capita to calculate the threshold and Stanford data to calculate project VMT is not consistent with OPR's direction (see quote to the left). The Advisory recommends an apples- to-apples comparison of results calculated using the same method.	Text has been added to the report to better explain how the methodology ensures use of the most accurate data to quantify VMT, while taking reasonable steps to ensure an apples-to-apples comparison to regional benchmarks.	This response appears to be OK, but this cannot be verified without a more specific reference. Please cite page numbers , paragraph, section, etc. in the response.
5	Tab 8: Numeric Significance Thresholds for 2018 GUP	9; Now on pages 23-24 of the document (for reference).	2nd paragraph	Delete "workers without students" discussion as it serves no purpose.	We agree that it is most appropriate to include students in the worker analysis. The "workers without students" scenario also is included as a sensitivity analysis to confirm that employee VMT, without accounting for student travel, would also be beneath the significance standards. We think this information should be included for transparency purposes.	If that's the case, this needs to be explicitly explained in the document. Explain what sensitivity this is testing, why it is important, and how it is relevant to the larger analysis.
7	Tab 8: Methodology for Calculating 2018 GUP VMT	10+	Methodology for Calculating 2018 GUP VMT	Include a discussion of available methodologies and why the system selected was most appropriate. For example, VTA's Transportation Impact Analysis (TIA) Guidelines (adopted October 2014) lists several trip generation methodologies in Appendix D. Include this in the TIA part 1, Trip Generation as part of the revision to	This information has been included in TIA part 1, Trip Generation.	The F&P response needs to provide the section / page where this is explained for reference. We are unable to complete our peer review without the specific reference of where an issue is resolved, particularly when it is cited in another document.

Comment #	Section	Page	Application Content	AECOM Comment March 10, 2017	F&P Response May 4, 2017	AECOM Response May 24, 2017
				the analysis based on AECOM's peer review of the first draft of the TIA report which AECOM submitted December 16, 2016.		
13	Tab 8: General methodology for Counting VMT	15	"The most recent survey had a response rate of 35%."	Tab 7, page 9 stated that the most recent survey had a response rate of 41%. Verify/explain this difference.	The revised report corrects this inconsistency. As stated on page 9 of TIA part 1, "The most recent survey was sent to over 50,000 individuals and had 20,725 responses (~41%). "	Note that page 18 (called page 14, erroneously, in the document), cites a 33% response rate. This 33% response rate was also noted on the agenda for the teams' April 26, 2017 meeting: "*(10,670 responses/33 percent)*". The number and percentage should be noted and be consistent. AECOM looks forward to Stanford's response to our concerns regarding ensuring this analysis used conservative assumptions regarding their surveys, which we anticipate to be submitted separately.
18	Tab 8: Worker VMT	17	"Stanford's surveyed drive-alone rate for employees and students living off-campus is around 50% (1) which substantially reduces the amount of vehicle miles traveled compared to all workers in the county with a drive-alone rate of 77% (2). For third party contractors, janitorial contractors and construction contractors, the auto mode split was assumed to be 87% (3) (drive alone, carpool, and vanpool) based on the US Census Journey to Work data."	1) Discuss limitations and potential error in the survey results. 2) Include year of data. 3) Provide citation and how this number was derived from the census and from which year of data. Explain the relationship between 3rd party contractors, janitorial and the transportation survey here. Another indication of the need for a deeper discussion of the survey and how it can and should best used.	1) Added discussion of survey limitations. 2) Data was surveys conducted during the 2014-2015 academic year. 3) Data is provided in Appendices in the notes at the bottom of the Workers tab. Citation added to report.	Response is OK once we have reviewed the survey documentation towards a conservative analysis.

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com
415.896.5858 tel
415.882.9261 fax

Memorandum

Comment #	Section	Page	Description	Comments
39	3/21/17 Memo: Daily Trip Validation	1	Data Sources	While Stanford's transportation survey is not listed as a data source, Attachment A, pages 2 and 3 indicate that it is a significant source. We look forward to reviewing Stanford's discussion of the self-selected survey data issue which we understand is forthcoming.
40	3/21/17 Memo: Daily Trip Validation	2	Data Sources	AECOM has confirmed that the 2015 average weekday raw traffic volumes for the 8 weeks of data collection do match the memo's 75,685. However, consider if it is appropriate for this number to be adjusted with the pass-through traffic and hospital trips for this purpose. These adjustment considerations should be included in the discussion – whether they are applied or not.
41	3/21/17 Memo: Daily Trip Validation	3	Table 1	Confirm if #8 should read "Graduate/Post Doc" (instead of just Graduate). If so, should the 64 Post-Doc trips from Column N of Attachment A page 3 (Daily Trip Validation Analysis, Resident Daily Table) be included? The total daily trips for "Residents" (Table 1) should be 19,997 instead.
42	3/21/17 Memo: Daily Trip Validation	3	Table 1, lines 20 and 21	This validation process appears to rely on the comparison of the two pass-through traffic percentages. This poses two significant problems: 1) AECOM's pass-through traffic percentages are based on tabulations during the peak hours only. There is no reason to believe that all-day pass through traffic would match the peak hour. 2) AECOM does not agree that finding a similar pass-through percentage for different time periods, through a calculation that involved several assumptions and backed-in data would represents a reasonable source of validation.
43	3/21/17 Memo: Attachment A	2	Table for "Daily Trip Validation Analysis, Worker	Confirm if Column G description should read "Calculation = (population * Commute Frequency*Vehicle Mode Split/Vehicle

Comment #	Section	Page	Description	Comments
			/Student Commute VMT (HBW)"	Occupancy)*2" to account for round trip.
44	3/21/17 Memo: Attachment A	2	Table for "Daily Trip Validation Analysis, Worker /Student Commute VMT (HBW)"	Resident Faculty / Staff: it seems highly unlikely that people who both live and work on campus would have an 80% drive alone rate for their one-mile average commute
45	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	Provide more information regarding the "Stanford Work Force Adjustment' in Column G.
46	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	Clarify how the external & internal split of the HBW trips (Columns L & M) obtained.
47	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	Clarify how the daily trip rates were obtained (or source) under Column D description
48	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	It should read : Column Y Total VMT/Total Population
49	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	It should read Column Z Total VMT/Total Population
50	3/21/17 Memo: Attachment A	4	Daily Trip Validation Analysis (top table)	For clarity, indicate which of the listed categories are considered 'Event Trips' and 'Non-Event Trips (daily)'
51	3/21/17 Memo: Attachment A	4	Daily Trip Validation Analysis (top table)	For clarity and completeness of the table, indicate the % under Column I and Column K, how and where they are obtained.
52	3/21/17 Memo: Attachment A	4	(bottom section)	Clarify the trip lengths and their sources used for calculating the Fall 2015 Total VMT for: • Vendor/business or academic meetings • Worker Non-commute – Personal Business Deliveries / trucks @ 2% of traffic

Comment #	Section	Page	Description	Comments
53	Tab 8: General		Tables in main report and Appendices	Data needs to be consistently reported across the different tables throughout the report including appendices. For example, data in Tables 3 & 4 are the same as the appendices, but the corresponding data in Table 5 and after are different (presumably due to rounding). Hence, in the main text of the report, the same data appears differently, causing confusion. The calculated VMT / Capita is presented only to 1 decimal place in the appendices but appeared as 2 decimal places in the main text (presumably to be consistent with the Threshold of Significance).
54	General		Page number and Header	Page after Table 4 (page 17) should continue as 18 (not 14) Change Header from “November 2016” to “May 2017”
55	Tab 8: TOC		TOC	Include all tables in TOC
56	Tab 8	3	Transit Impacts	OPR and VTA provide conflicting direction on the role of the transit capacity analysis in the TIA. VTA’s GUIDELINES vs. OPR’S ADVISORY The OPR Technical Advisory (Jan 2016) and VTA’s TIA Guidelines (Oct 2014) do not provide the same direction on transit impacts. VTA’s TIA Guidelines state (footnote is ours): *12.4 Projects Generating Large Numbers of Pedestrian, Bicycle or Transit Trips* *For projects that generate unusually large volumes of pedestrian, bicycle or transit trips, it may be necessary to include a quantitative analysis of*

Comment #	Section	Page	Description	Comments
				demand and capacity for these modes.[2] *Examples of typical land uses that may require a pedestrian, bicycle or transit capacity analysis are arenas and stadiums, special event sites, large mixed-use developments and TODs, and schools.* *The transit capacity analysis should consider the existing ridership and load factors of transit routes near the proposed project, which can be obtained by consulting with VTA and other transit operators that may be affected (e.g. Caltrain, ACE, etc.). If the new transit ridership generated by the project causes the load factor of one or more transit routes to exceed the standard established by the applicable transit agency, the project should contribute to transit improvements to enhance the capacity of the affected route or provide alternative facilities.* (page 56-57) OPR Technical Advisory states: *When evaluating impacts to multimodal transportation networks, lead 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.* (page III:26)

[2] This section provides clear guidance for the lead agency. While this first sentence may not sound like a requirement, the previous sections under Chapter 12 provide a stronger context for lead agency direction.

Comment #	Section	Page	Description	Comments
				AECOM staff spoke with Robert Sweirk at VTA about this discrepancy. Below, please find the outcome of that conversation. WHAT IS REQUIRED: Following OPR's Technical Advisory, instead of VTA's TIA Guidelines, is problematic for two reasons: (1) The County is still obligated to comply with the CMP. Projects often use VTA's TIA Guidelines for compliance with CEQA. Up until now, that dual purpose was appropriate as requirements were the same. However, when state advice and VTA Guidelines differ, the County remains obligated to fulfill the requirements of the CMP as one of the 16 partner agencies who agreed to it. (2) OPR's Technical Advisory on this matter remains "advisory" at the discretion of the lead agency (the County in this case). Specifically, the OPR Technical Advisory states *III. Technical Advisory on Evaluating Transportation Impacts in CEQA Section III of this document includes a draft Technical Advisory which contains OPR's technical recommendations and best practices regarding the evaluation of transportation impacts under CEQA. Unlike the provisions in Section II of this document, the Technical Advisory is not regulatory in nature. The purpose of this document is simply to provide advice and recommendations, which lead agencies may use in their discretion. Notably, OPR may update this document as frequently as needed reflect advances in practice and methodologies." (Page III:10)* Note that the language quoted earlier in this

Comment #	Section	Page	Description	Comments
				section on transit impacts is from section III, the "advisory" section. ALSO NOTE: Robert Sweirk mentioned that a number of recent EIRs included robust analyses of transit impacts including the Stanford Hospital EIR as well as the new Apple campus and CityPlace EIRs. He would be happy to discuss this requirement, or the process in general, with the County in more detail.
57	Tab 8: Numeric Significance Thresholds for 2018 GUP	10 12	Quotations from the OPR Advisory	Always include the page number and sections, etc. of citations. In the case of the OPR it is important to note both the roman numeral and the page since II = guidelines III = advice This is critical for AECOM to be able to complete our peer review without additional time spent trying to locate references.
58	Tab 8: Campus Population	15	Last paragraph	Moving off campus students onto campus does NOT "eliminate" HBW trips, it only shortens them. Correct this text.
59	Table 4	17	Study Area Resident Population Growth	Should the "Affiliates" for Graduate Student under "Fall 2015 to Fall 2018" be 5,201 (instead of 5,245) and under "Fall 2018 to Fall 2035" be 8,121 (instead of 8,183)? Note: This comment also applies to Column B of Sheet 2 (Residential Daily VMT) under Appendices B1 and C.
60	Table 4	17	Study Area Resident Population Growth	The proportion of Graduate Student "Population" to "Affiliates" appears to be different for the different timeframes. Explain if this due to rounding or Stanford has more information on the future household size of the affiliates.
61	Table 4	17	Second paragraph	For clarity, edit the second last sentence to "Appendices A, B1, B2 and C include the worksheets used to calculate VMT for each of the 4 timeframes."
62	Table 4	17	Listing of the 6 worksheets	Be consistent in the worksheet titles for easy cross referencing (particularly #2 and #6)
63	Worker VMT	17	1st paragraph	The 12 groups of workers are described on

Comment #	Section	Page	Description	Comments
				(the correct) page 14 (not 12). Correct page references are important to AECOM being able to conduct an efficient peer review.
64	Tab 8: General Methodology for Counting VMT	Called 15, incorrect pagination?	Second set of bullet items: survey controls	AECOM looks forward to more detail being provided on each of these bullet points in the survey data justification document. For example, reconciliation with cordon counts includes backing in the number of visitors (only 1% of visitors are "known" as shown on page 22); so it is not defensible for this context.
65	Tab 8: General Methodology for Counting VMT	Called 16, incorrect pagination?	Residential analysis	Spouses and Stanford affiliates appear to be combined in this category. With this in mind, it no longer makes sense to assume a trip length of just 1 mile for all residents. Suggest separating spouse trips for simplicity, or alternatively, explain and provide a weighted average including spouse trip lengths.
66	Tab 8: General Methodology for Counting VMT	Called 17, incorrect pagination?	1st paragraph	TDM program does not "reduce trips", it creates an incentive for trip reduction.
67	Worker VMT	18	Trip Length (Column H)	The description states that the average weighted trip lengths for the first 9 worker categories were calculated based on the worker's place of residence and commute mode. But commute mode is already accounted for in Column E. Clarify this methodology. AECOM is concerned that it is being discounted twice.
68	Tab 8: Worker VMT	Called 18, incorrect pagination?	Daily trips	Calculation appears to be commute trips only (HBW). If so, call them that, and not "daily trips".
69	Residential VMT	19-20	HBW vs HBO Trips (Column E-K)	The description states that many graduate students do not travel to off-campus jobs resulting in a lower number of HBW trips. However, this discussion is of "trip type" (HBW or HBO) which doesn't have anything to do with working on or off campus; on-campus (internal) trips and off-campus (external) trips are accounted for in Cols J-O.
70	Comparison	27	Fall 2015 and	Confirm if the first sentence should be "Table

Comment #	Section	Page	Description	Comments
	of Changes		Fall 2018 Conditions	10 shows that between Fall 2015 and Fall 2018 daily VMT….".
71	Comparison of Changes	28	1st para	The addition of the "420" students mentioned in the last sentence presumably refers to the "423 Total Students" (Line 6) from Table 3 (of the same timeframe). Use same number to avoid confusion (the same sentence states the exact 416 student beds to be added without rounding – be consistent).
72	Tab 8: Stanford's TDM program	30-32	Tone and content of section	Same comments as previously submitted in memo "Peer Review of the 2018 General Use Permit review of Transportation Impact Analysis (TIA) (Tab 7) sections 1 and 2 and Appendix A only" on February 2, 2017.
73	Tab 8: Stanford's TDM program	31	Figure 4	Correct Figure title
74	Annual VMT Calculations	34	Worker Annual VMT	The second sentence of the 2nd paragraph (after listing of the appendices) does not make sense. Need to clarify.
75	Annual Weekend VMT	35	Annual Weekend VMT	Provide more information for the calculation (Column M & N of all Appendices). E.g. Why are the weekend internal HBO trips assumed to be same as weekday? How are the average weekend trip rates being used?
76	Total Annual VMT	38	Table 13	Totals appear to be double counting. Except for spouses, which are not tracked separately in the analysis, residents should already be included in the "workers" category. Need to correct these totals to reflect that fact.
77	Appendix A	3	Worker / Student Commute VMT (HBW) Column D	State where the details of the Daily Trip Generation discussed in this TIA. Reference the location in the text. The daily trip rates warrant a separate discussion of its own.
78	Appendix A	3	Column F – Veh Mode Split, Line 13, 36 & 37	By using a 0% mode split is to assume that all resident post doc, undergraduate and graduate students do not drive to work (school). While it is logical that most of them would not use the car, it is not reasonable to assume that no single student (or post doc) resident would be driving to work on any

Comment #	Section	Page	Description	Comments
				given day. Moreover, the residential VMT calculation accounted for some HBW trips by graduate students. Need to clarify. For example: people with a temporary or permanent disability (such as pregnancy or a broken foot) may drive or be driven even a short distance.
79	Appendix A	3	Residential VMT, Column E, F & G	Suggest removing (or changing the color of) these 3 columns from the main table. Instead, use them as explanation for Column H & I (similar to what is done for Column D) to avoid confusion; these columns are not part of the main equation for VMT calculation.
80	Appendix A	3	Column H	See #78 on 0% HBW assumption for undergraduate and post doc.
81	Appendix A	3	Column L & M	Explain how the internal and external trips split for HBW trips are obtained for "faculty/staff". In addition, see comment #78 for 0% work trips for graduate student (internal), undergraduate and post doctoral students.
82	Appendix B2	3	Residential VMT, Column B	Confirm if the "Affiliates" for Graduate Student should be 7,221 (instead of 7,265).
83	Appendix C	1 and 3	Page 1: Line "2035 Trip Length Adjustment… Page 3: Residential VMT, Column P & R	This comment relates to the expected increase in average trip lengths in 2035. Page 1: The current calculation applies the increase (2% HBW and 3% HBO) to both external and internal trips. However, since the campus's physical boundary is not expected to increase, it is reasonable to assume that the internal trip length will remain at 1 mile in 2035 (page 3). As such, the current method is more conservative. Provide additional text to explain this for clarity.
84	All Appendices	5	Residential Annual VMT	The columns listed in the explanation section were incorrectly referenced. Our peer review requires correct references to be conducted efficiently.
85	All Appendices	5	Residential Annual VMT	Suggest adding a column for the number of days per year used to calculate the annual VMT in the main table (similar to commute

Comment #	Section	Page	Description	Comments
				VMT table) – before Column J and before Column S.
86	All Appendices	5	Residential Annual VMT	Refer to Comment #75 – it is not clear how the weekend HBO trips (Column M & N) were derived / calculated.

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Memorandum

To	ESA: Paul Mitchell	Pages	3
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) Application: VMT RTC 2 – Response Matrix_062917		
From	AECOM: Nichole Seow, and Greg Gleichman		
Date	July 18, 2017		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.[1]

This memo documents AECOM's final comments regarding Fehr & Peers' response (dated 6/29/2017) to AECOM's review comments dated 5/24/2017.

[1] This language is from the scope of work in the AECOM contract for this project.

AECOM
Memorandum

AECOM
300 California, 6th Floor
San Francisco, CA 94104
www.aecom.com

415.896.5858 tel
415.882.9261 fax

Stanford GUP 2018 Application

VMT Response to Comment Matrix dated 6/29/2017 – AECOM Comments

	Section	Page	Description	AECOM Comments (5/24/2017)	AECOM response
2	Tab 8: Populations Included in the Analysis	6-7	Figure 1	The map update does not appear to be correct for the Marguerite shuttle. Most Marguerite routes do not have frequencies of 15 minutes or less during peak commute hours……	In the following sentence (which is the last sentence on Page 6), add the text underlined below: A high quality transit corridor means a corridor with fixed route bus service <u>with service</u> intervals no longer than 15 minutes during peak commute hours. This makes the sentence consistent with the PRC definition. No further comments.
18	Tab 8: Worker VMT	17	Stanford Transportation Survey issues.	Response is OK once we have reviewed the survey documentation towards a conservative analysis.	The F&P response incompletely identifies the location of their response to AECOM's concerns regarding use of the transportation survey. This response is encompassed within the discussion on pages 11 – 13 of the TIA Part 1 report dated May 19, 2017. AECOM has no further comments.
41	3/21/17 Memo: Daily Trip Validation	3	Table 1	Confirm if #8 should read "Graduate/Post Doc" (instead of just Graduate). If so, should the 64 Post-Doc trips from Column N of Attachment A page 3 (Daily Trip Validation Analysis, Resident Daily Table) be included? The total daily trips for "Residents" (Table 1) should be 19,997 instead.	Noted F&P comments on 6/29/2017. No further comments.
43	Attachment A	2	Table for 'Daily Trip Validation Analysis,	Column G description should read 'Calculation = (population *	Response missing. But noticed that the text in the 'Stanford 2018 GUP Daily Trips

			Worker /Student Commute VMT (HBW)'	Commute Frequency*Vehicle Mode Split/Vehicle Occupancy)*2' to account for round trip?	– VMT Validation/Calibration and Projections' Memo revised on 6/26/2017 by F&P has been updated. No further comments.
44, 46-55, 57-63, 66-71, 73-75, 77-86					Noted F&P comments on 6/29/2017. No further comments.
45	3/21/17 Memo: Attachment A	3	Table for 'Daily Trip Validation Analysis, Resident Daily'	Provide more information regarding the "Stanford Work Force Adjustment' in Column G.	Noted F&P comments on 6/29/2017. However, explanation for 'Post Doc' is missing?