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December 2019

# **LBRE Replacement Building Local Access and Circulation Study**

Prepared for:  
Stanford Department of Project Management

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WC19-3607.00

FEHR  PEERS

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# 1. Introduction

## 1.1 Background

This report presents the local access and circulation characteristics of the proposed LBRE Replacement Building (Project). This report has been prepared because the Project proposes a re-distribution of 73,000 square feet of floor space from the DAPER Development District to the West Campus Development District. GUP Conditions of Approval D.5.a and D.6 require that an environmental assessment of such projects be prepared, and GUP Condition of Approval G.11 describes the scope of traffic studies for the environmental assessment. Further detail on the scope and methodology of the studies is provided in the memorandum of understanding (MOU) entitled *Scoping of Project-Specific Transportation Studies under Stanford GUP Condition of Approval G.11*.

The Project site plan is shown in **Figure 1**.

## 1.2 Project Description

The Project, located in the West Campus Development District in the vicinity of Fremont Road and Electioneer Road, includes three components: a new 73,000 square-foot building to serve as a consolidated facility for the on-campus Lands, Buildings and Real Estate (LBRE) functions; a shed to house large equipment; and a conversion of a portion of the Searsville parking lot to maintenance vehicle storage.

### New LBRE Building

#### *Facility*

The new building will house the majority of the on-campus LBRE employees. The new facility will foster a diverse set of job functions including office, shop technicians, field technicians, grounds teams, warehouse, and event services. The new building and program will replace LBRE's four large buildings and the several small ancillary buildings on Bonair Siding, which are nearing the end of their useful life. The new building will be constructed on a vacant site west of Fremont Road and south of the Central Energy Facility. It will be three stories above grade and will include eight loading docks for trucks, as well as space for two to three tractor-trailer (large-wheelbase) trucks along the north edge of the building. The site includes a turnaround at the northwest corner for vehicle and truck maneuvering.



### *Uses*

Desk employees will relocate from Bonair Siding buildings to work in the new building, and shops/grounds/trades workers will check in at the beginning of the work day (typically 5:30 – 6:00 AM) and check out at the end of the work day (2:30 – 3:00 PM).

The building will also facilitate on-campus logistics for the Buildings, Grounds and Maintenance (BGM) group, including event set-up and take-down and other activities. These trips currently occur at the Bonair Siding site, and would relocate to the new building. These trips are all internal to the campus. An estimated 20 to 25 round trips per day are typically made.

Approximately 5 to 15 external deliveries per day to the LBRE facilities warehouse typically occur at the Bonair site, and these would relocate to the new building. Most deliveries are in single-unit trucks, with occasional large tractor-trailer truck deliveries.

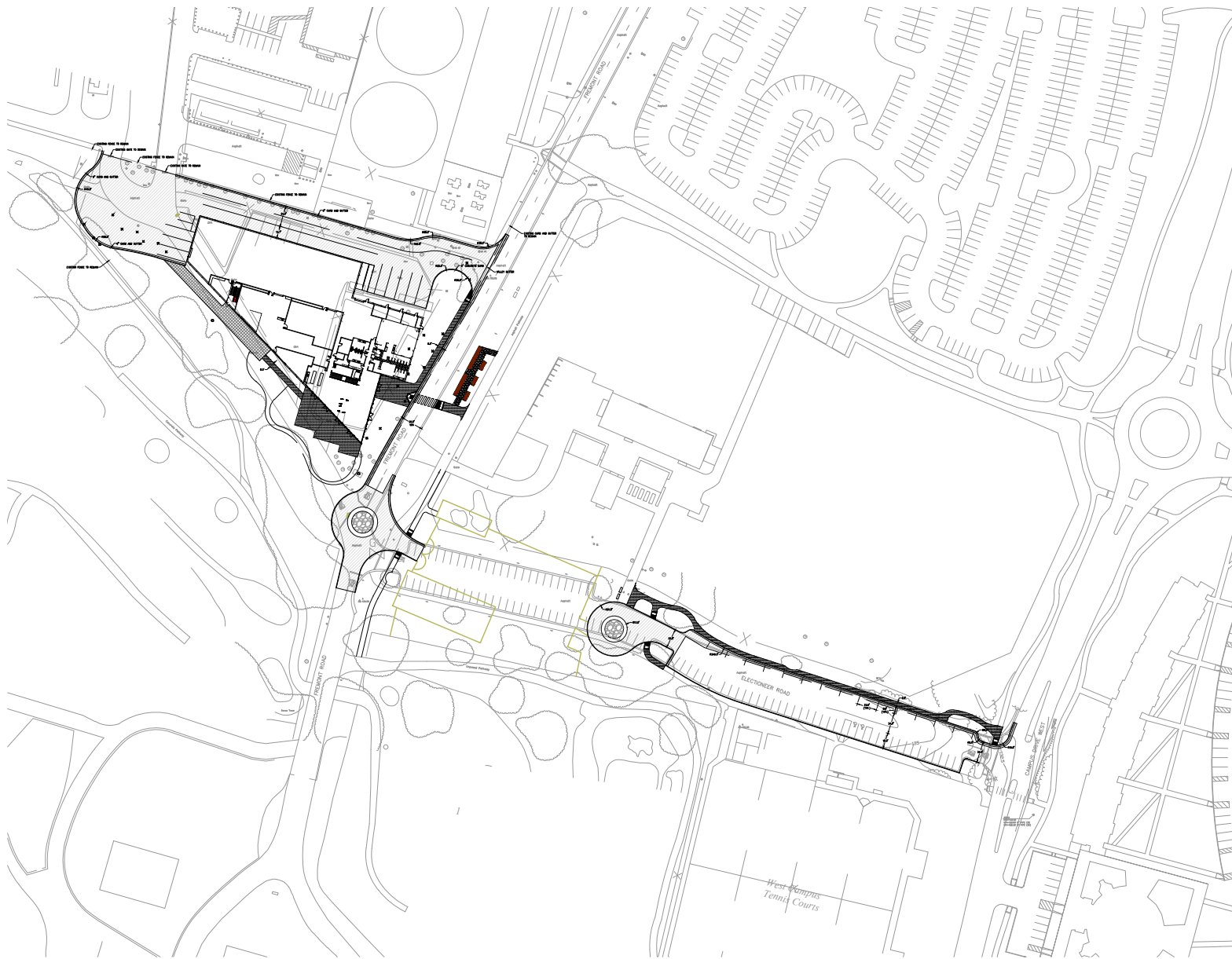
### **Equipment Shed**

A shed to house heavy equipment will be constructed on the western portion of Electioneer Road, with access/egress to be provided both from Fremont Road and Electioneer Road; through traffic on Electioneer Road will no longer be allowed. A turn-around at the new western end of Electioneer Road will serve drivers needing to turn around as well as trucks/heavy equipment access and egress. The construction of the shed will eliminate up to 55 parking spaces on Electioneer Road.

### **Maintenance Vehicle Parking**

A portion of Searsville Lot (L22) will be converted from commuter and resident parking to maintenance vehicle storage. The estimated loss of parking spaces is 250 spaces out of the total 611-space parking supply.





Site Plan Source: BKF Engineers, December 2019

Figure 1



## 2. Existing Conditions

### 2.1 Study Area Roadway Network

**Figure 2** shows the study area, which focuses on the internal campus network immediately surrounding the Project site. A description of the study area roadways is provided below.

**Fremont Road** is a two-lane roadway providing access between Searsville Road and Electioneer Road, and access to the Central Energy Facility, the Stanford Educational Farm, and the Stanford Equestrian Center. A sidewalk is provided along the Central Energy Facility frontage between Searsville Road and the main building entrance, and a striped pedestrian crossing is provided between the building's northeast access point and the Searsville parking lot.

**Electioneer Road** connects Campus Drive West to Fremont Road, with perpendicular on-street parking on one or both sides. The West Campus Tennis Courts are accessed from Electioneer Road. A sidewalk is provided along the south side of the roadway.

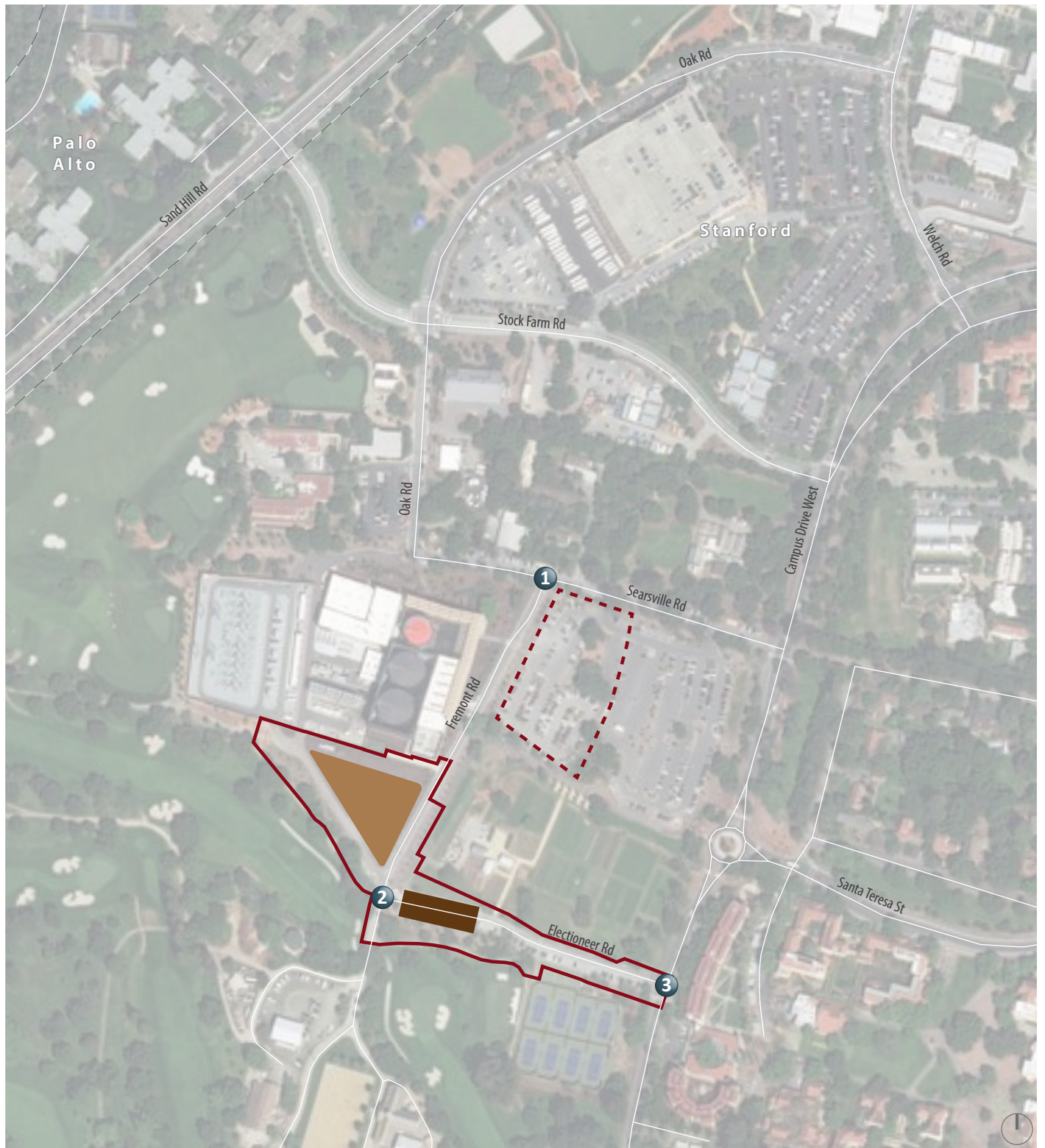
**Searsville Road** connects Campus Drive West to Oak Road, providing access to the Searsville parking lot via two driveways. A sidewalk is provided along the south side of the roadway adjacent to the Searsville parking lot. Perpendicular parking is provided along portions of the north side of the roadway.

This study includes AM and PM peak hour intersection operations evaluation for the following three on-campus intersections immediately adjacent to the Project site. Note that the effect of the Project on the external intersections studied in the 2000 General Use Permit EIR is provided in the separate report, *LBRE Replacement Facility GUP EIR Intersection Evaluation*.

1. Fremont Road/Searsville Road
2. Fremont Road/Electioneer Road
3. Campus Drive West/Electioneer Road







- Area of Work    1 Study Intersection
- LBRE Replacement Building     Equipment Shed
- Convert to Fleet Parking (Approximate)



Figure 2

## Study Area

## 2.2 Peak Hour Traffic Volumes

AM and PM two-hour peak period counts of vehicles, bicyclists and pedestrians were conducted at the study intersections on Wednesday, May 29, 2019, when spring quarter was in regular session. **Figure 3** shows the AM and PM peak hour vehicle turning movements, and **Figure 4** shows the peak hour bicycle turning movements and pedestrian crossings.

## 2.3 Intersection Operations

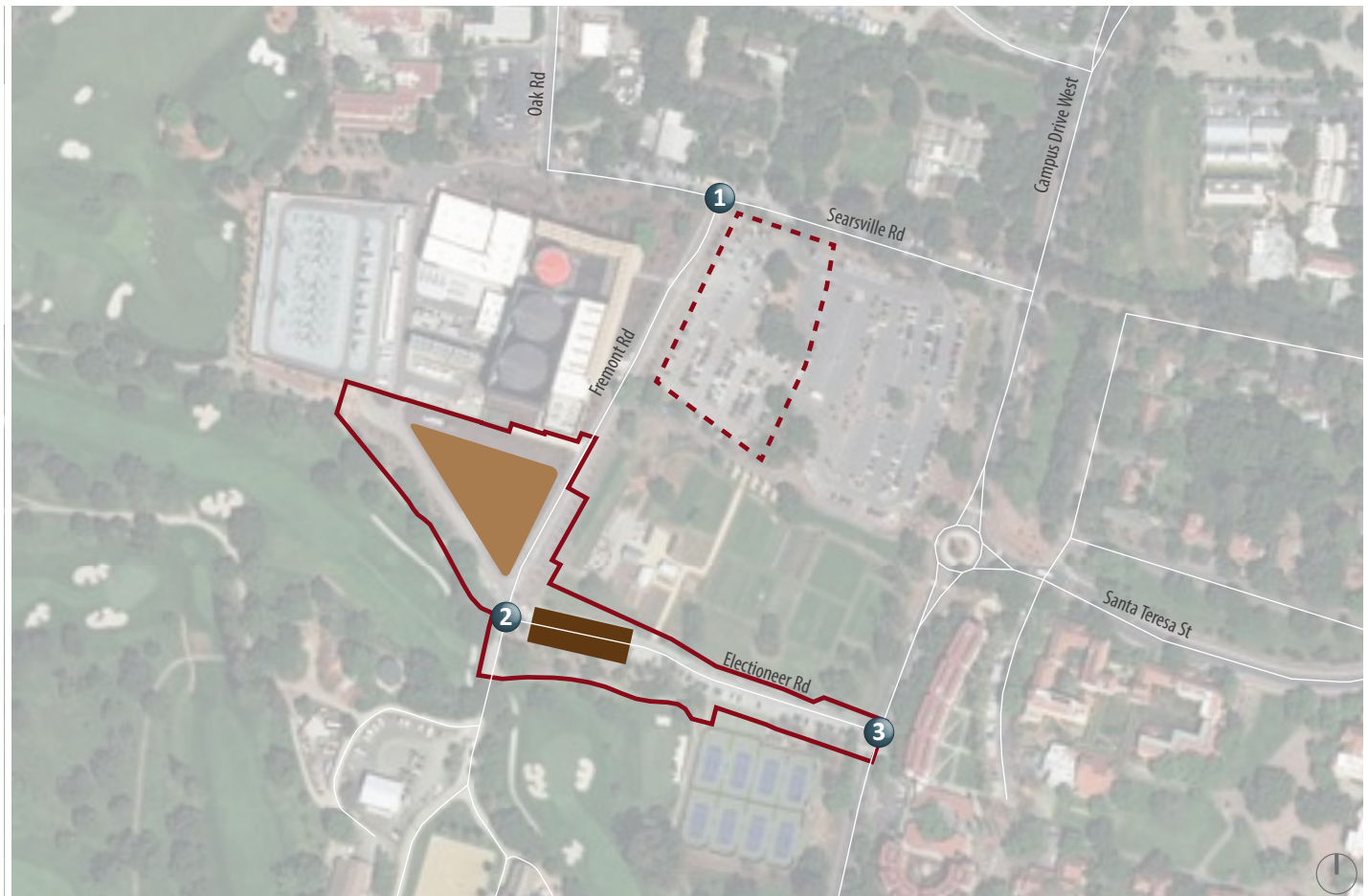
The study intersections include all-way stop-controlled and side-street stop-controlled intersections. For this analysis, the *Highway Capacity Manual 6<sup>th</sup> Edition (HCM 6)* methodology is used. For stop-controlled intersections, this method defines intersection operations by the average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street stop-controlled intersections, the delay and LOS are typically reported for the worst stop-controlled movement or approach, along with the average delay and LOS for the entire intersection. The Synchro 10 analysis software is used to calculate the LOS for stop-controlled intersections.

**Table 1** summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 1 UNSIGNALIZED INTERSECTION LOS CRITERIA		
Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no traffic delays	$\leq 10.0$
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual – Special Report 209* (Transportation Research Board, 2010).





1. Searsville Rd/Fremont Rd	2. Fremont Rd/Electioneer Rd	3. Campus Drive West/Electioneer Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes Stop Sign

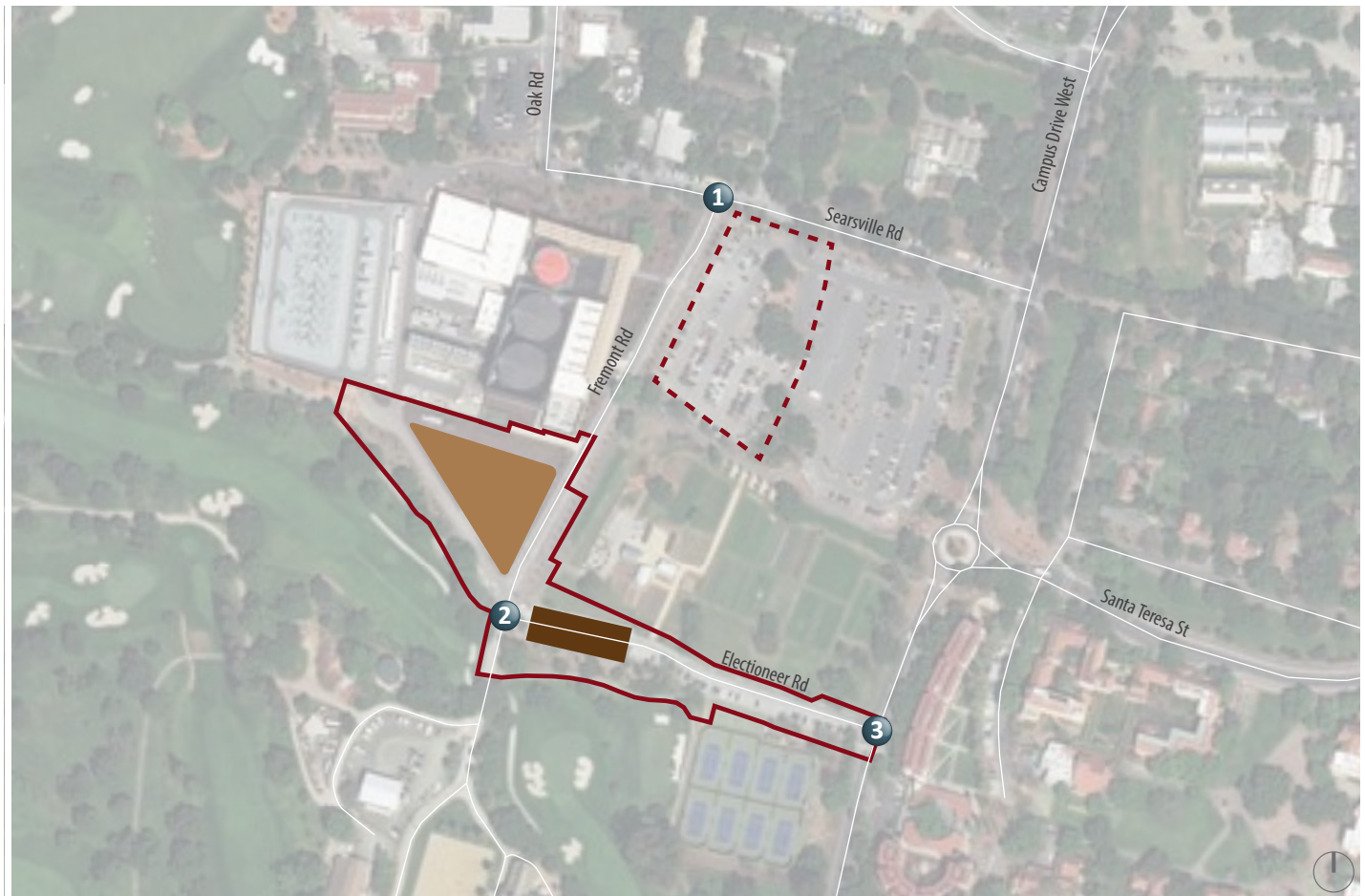
Study Intersection Area of Work LBRE Replacement Building Equipment Shed Convert to Fleet Parking (Approximate)



Figure 3

## Existing Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls





1. Searsville Rd/Fremont Rd	2. Fremont Rd/Electioneer Rd	3. Campus Drive West/Electioneer Rd

x (y) AM (PM) Peak Hour Pedestrian Volumes
 x (y) AM (PM) Peak Hour Bicycle Volumes
 Stop Sign

# Study Intersection
 Area of Work
 LBRE Replacement Building
 Equipment Shed
 Convert to Fleet Parking (Approximate)



Figure 4  
Existing Peak Hour  
Bicycle and Pedestrian Volumes

**Table 2** shows the existing service levels at the internal study intersections. Currently, all intersections operate well during the AM and PM peak hours.

TABLE 2 EXISTING INTERSECTION LEVELS OF SERVICE				
Intersection	Traffic Control	Peak Hour	Existing	
			Delay	LOS
1. Fremont Road/Searsville Road	Side-Street Stop	AM PM	1.0 (9.0) 0.5 (8.9)	A (A) A (A)
2. Fremont Road/Electioneer Road	All-Way Stop	AM PM	7.3 7.0	A A
3. Campus Drive West/Electioneer Road	Side-Street Stop	AM PM	0.5 (13.0) 0.6 (16.8)	A (B) A (C)

Side-street stop-controlled intersection LOS is reported as: overall intersection delay and LOS (worst-case movement or approach delay and LOS).

All-way stop controlled intersection LOS is reported for the overall intersection, based on average delay per vehicle.

Source: Fehr & Peers, December 2019.



## 3. Project Evaluation

### 3.1 Project Traffic Estimates

#### Trip Generation

As described in Section 1.2, the project will relocate employees and activities from Bonair Siding to the Project site on Fremont Road. The components of the Project and associated effect on AM and PM peak hour trip generation are described below.

- *The relocation of the desk employees to the Project site* is not expected to affect AM and PM peak hour traffic volumes in the study area, because commuter traffic patterns within the campus are based on parking supplies and locations. The Project will reduce the permit parking supply in the local access and circulation study area by 305 spaces. Therefore, the Project's effect on commuter traffic in the local access and circulation study area is expected to be a net reduction. However, for the purposes of the Existing With Project traffic analysis, no reduction was taken because maintenance vehicles may travel locally during peak hours.
- *The relocation of the shop workers check-in/check-out location* will also not affect peak hour trip generation in the local access and circulation study area, because the shop workers begin and end their workday at 5:30 – 6:00 AM and 2:30 – 3:00 PM, respectively, which is well before the AM and PM peak hours of the adjacent streets (8:00 – 9:00 AM and 5:00 – 6:00 PM).
- *The relocation of the BGM logistics activities* is expected to generate 20 to 25 round trips within the local access and circulation study area per day. These trips would not leave campus, but rather travel between the Project site and various on-campus destinations. Note that these trips are not new trips, but rather relocated trips from the Bonair Siding facilities to the Project site. Using the high end of 25 round trips per day, a peak hour estimate would be 25 divided by 8 hours per day, or *6 round trips per peak hour*.
- *The relocation of the external deliveries* to the LBRE facilities warehouse from Bonair Siding to the Project site would result in an estimated 5 to 15 external deliveries per day. Note that these trips are not new trips to the campus, but rather relocated trips from the Bonair Siding facilities warehouse to the Project site. Using the high end of 15 round trips per day, a peak hour estimate would be 15 divided by 8 hours per day, or *2 round trips per peak hour*.
- *The new heavy equipment shed* on Electioneer Road will be used for storage, and equipment will be moved to and from work locations as needed. These movements are not expected to occur within the peak commute hours on a regular basis. In addition, the loss of up to 55 parking spaces on Electioneer Road will reduce traffic entering and exiting Electioneer Road at Campus



Drive West; however, for the purposes of the Existing With Project traffic analysis, no reduction was taken.

- *The elimination of 250 parking spaces in the Searsville parking lot to provide space for maintenance vehicle storage will reduce traffic related to commuter and resident parking trips at the Searsville parking lot driveways. Some maintenance vehicle movements between the storage lot and on-campus destinations will occur, including, potentially, trips during the peak commute hours. It is expected that the net change in peak commute hour traffic at the lot driveways will be a reduction in traffic; however, for the purposes of the Existing With Project traffic analysis, no reduction was taken.*

**Table 3** summarizes the estimated Project trip generation based on the above discussion. As noted above, this is considered a conservative estimate, as several components of the Project are expected to reduce traffic in the local access and circulation study area, but these reductions were not included in the estimate.

TABLE 3 ESTIMATED PROJECT PEAK HOUR TRIP GENERATION									
Truck Type	AM Peak Hour			PM Peak Hour			Daily		
	In	Out	Total	In	Out	Total	In	Out	Total
Event Box Trucks (Internal to Campus)	6	6	12	6	6	12	50	50	100
Logistics Deliveries (External)	2	2	4	2	2	4	15	15	30
<b>Total</b>	<b>8</b>	<b>8</b>	<b>16</b>	<b>8</b>	<b>8</b>	<b>16</b>	<b>65</b>	<b>65</b>	<b>130</b>

## Trip Distribution and Assignment

The internal campus trips were assumed to travel to and from the LBRE Replacement Building site via Searsville Road. The external delivery trips may continue to use the gateways to campus that they currently use, with some re-routing to the Stock Farm Road gateway due to its proximity to the Project site. For the purposes of this analysis, the external truck trips were assumed to travel to and from the LBRE Replacement Building site via Stock Farm Road – Oak Road – Searsville Road – Fremont Road (entering), and the reverse to leave campus.

**Figure 5** shows the Project trip assignment based on the above assumptions, and **Figure 6** shows the Existing With Project intersection peak hour turning movements.



### 3.2 Existing With Project Intersection Operations

**Table 4** presents the study area intersection levels of service with the Project. Because the Project is estimated to generate very low net new peak hour traffic in the study area, the intersection service levels would remain good with the Project.

TABLE 4 EXISTING WITH PROJECT INTERSECTION LEVEL OF SERVICE						
Intersection	Control <sup>1</sup>	Peak Hour	Existing Conditions		Existing with Project Conditions	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
1. Fremont Road/Searsville Road	Side-Street Stop	AM	1.0 (9.0)	A (A)	1.9 (9.1)	A (A)
		PM	0.5 (8.9)	A (A)	1.6 (9.0)	A (A)
2. Fremont Road/Electioneer Road	All-Way Stop	AM	7.3	A	7.3	A
		PM	7.0	A	7.0	A
3. Campus Drive West/Electioneer Road	Side-Street Stop	AM	0.5 (13.0)	A (B)	0.5 (13.0)	A (B)
		PM	0.6 (16.8)	A (C)	0.6 (16.8)	A (C)

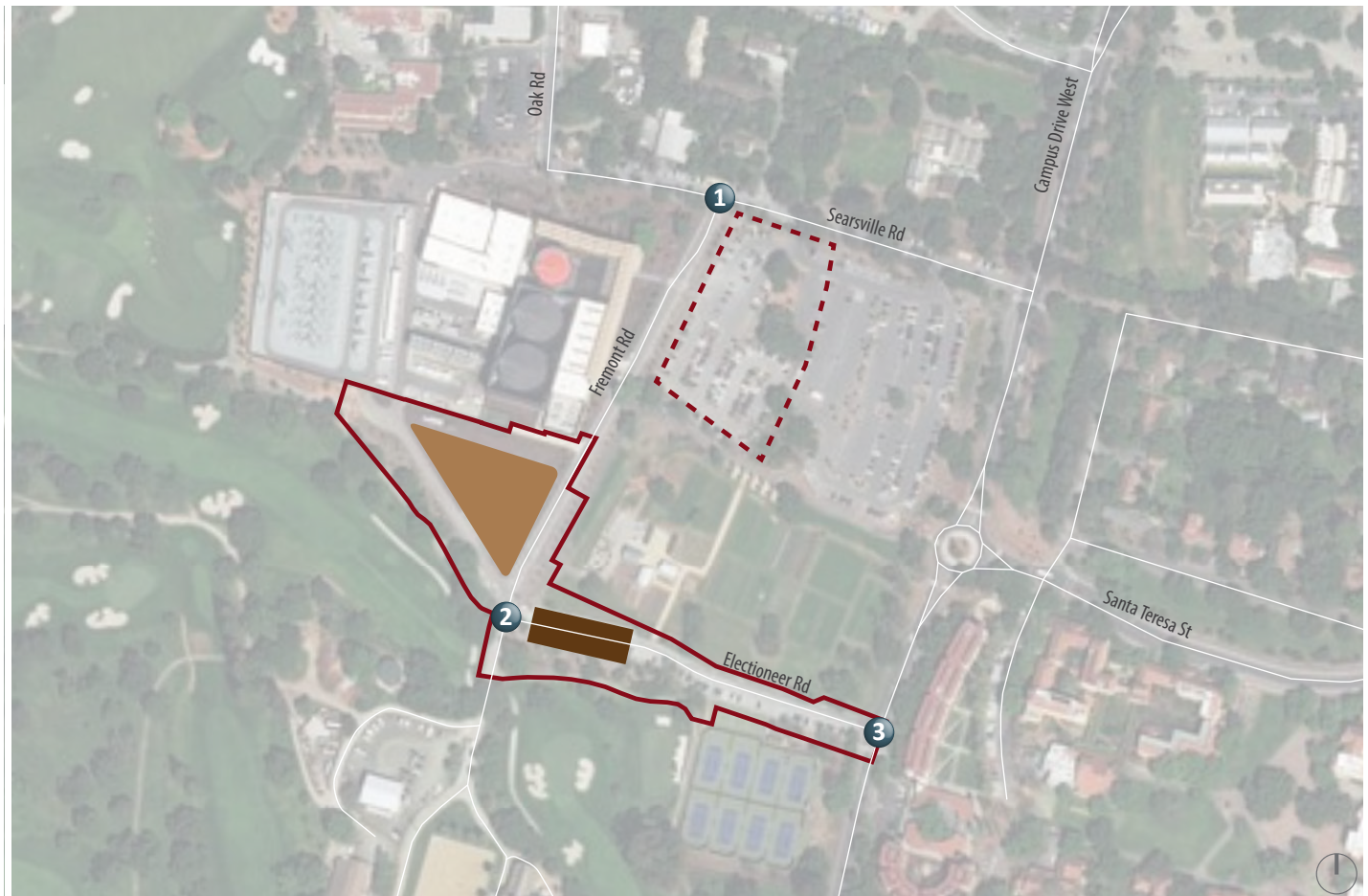
Side-street stop-controlled intersection LOS is reported as: overall intersection delay and LOS (worst-case movement or approach delay and LOS).

All-way stop controlled LOS is reported for the overall intersection, based on average delay per vehicle.

Source: Fehr & Peers, December 2019.







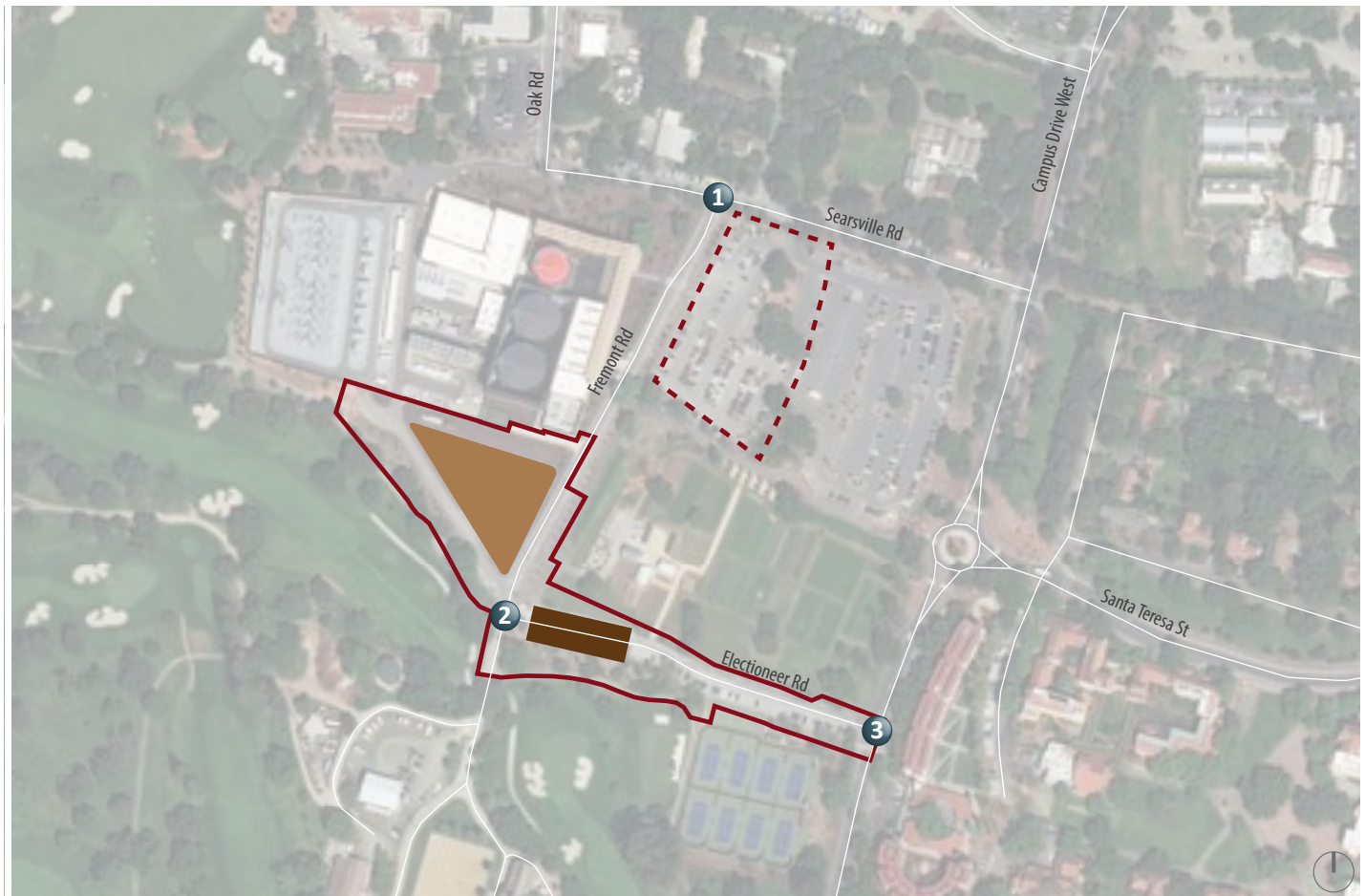
1. Searsville Rd/Fremont Rd	2. Fremont Rd/Electioneer Rd	3. Campus Drive West/Electioneer Rd
<p>Diagram 1: Searsville Rd/Fremont Rd. Shows traffic volumes: 6 (6) on Searsville Rd, 2 (2) on Fremont Rd, and 2 (2) / 6 (6) on the approach from the bottom. Stop signs are indicated at the intersection.</p>	<p>Diagram 2: Fremont Rd/Electioneer Rd. Shows traffic volumes: 6 (6) on Fremont Rd, 2 (2) on Electioneer Rd, and 2 (2) / 6 (6) on the approach from the bottom. Stop signs are indicated at the intersection.</p>	<p>Diagram 3: Campus Drive West/Electioneer Rd. Shows traffic volumes: 1 (1) on Electioneer Rd, 1 (0) on Campus Drive West, and 2 (2) on the approach from the bottom. Stop signs are indicated at the intersection.</p>

XX (YY) AM (PM) Peak Hour Traffic Volumes Stop Sign

Study Intersection Area of Work LBRE Replacement Building Equipment Shed Convert to Fleet Parking (Approximate)

Figure 5

## Project Trip Assignment



1. Searsville Rd/Fremont Rd	2. Fremont Rd/Electioneer Rd	3. Campus Drive West/Electioneer Rd
<p>25 (47) 9 (6)</p> <p>Searsville Rd</p> <p>55 (22) 9 (5)</p> <p>Fremont Rd</p> <p>9 (6) 7 (6)</p>	<p>2 (2) 3 (3) 5 (10)</p> <p>Fremont Rd</p> <p>6 (3) 2 (1) 9 (7)</p> <p>Electioneer Rd</p> <p>1 (3) 6 (1) 2 (0)</p> <p>1 (0) 1 (1) 6 (9)</p>	<p>9 (14) 194 (737)</p> <p>Electioneer Rd</p> <p>9 (8) 16 (21)</p> <p>Campus Dr West</p> <p>19 (14) 653 (267)</p>

XX (YY) AM (PM) Peak Hour Traffic Volumes Stop Sign

# Study Intersection Area of Work LBRE Replacement Building Equipment Shed Convert to Fleet Parking (Approximate)



Figure 6

## Existing with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

### 3.3 Pedestrian and Bicycle Access and Circulation

Pedestrian access to the Project site is provided by the walkways along the east side of Fremont Road and the west side of Fremont Road along the Central Energy Facility (CEF) site, the south side of Searsville Road, the south side of the Searsville parking lot, and the east side of Oak Road. These pathways connect the site to the larger campus pedestrian network. The Project design includes a pedestrian path along the west side of Fremont Road along the Project frontage, connecting to the existing path adjacent to the Central Energy Facility. A striped crosswalk will be provided to facilitate walking between the new building and the set-back path along the east side of Fremont Road.

Bicyclists travelling to and from the Project site would use the bicycle lanes on Campus Drive West and Stock Farm Road, and share the road with vehicles on Searsville Road, Oak Road and Fremont Road. Traffic volumes on Searsville Road and Fremont Road are low (refer to Figure 3), and are expected to remain low with the Project.

### 3.4 Transit Access

The Project site is located a short walk (a quarter to a third of a mile) from several Marguerite stops:

- Stops for the SLAC and Oak Creek Apartments (OCA) routes are located on Oak Road north of Fremont Road and on Searsville Road west of Campus Drive
- Stops for the Hospital Direct route are located on Campus Drive at Searsville Road
- Stops for the SLAC, O, N, SE, and OCA lines are located on Santa Teresa Street east of Campus Drive

The O and N routes can be used by employees and shop workers commuting by Caltrain, VTA or SamTrans. In addition, the X and Y routes are located nearby on Santa Teresa Street at Via Ortega. Transit access for the Project site is considered adequate, given the proximity to Marguerite stops.

### 3.5 Service, Delivery and Emergency Access

Service and delivery vehicle access to the Project site would be provided via the building's driveway on Fremont Road. Vehicles will use the Project driveway to access the loading docks, and generally will be able to enter the driveway head-in and exit head-out. Larger vehicles requiring extra turn-around space can use the 50-foot radius turnaround located at the end of the driveway, northwest of the building, or they can back out onto Fremont Road if needed (this is not expected to be a frequent occurrence). The Project plan set includes truck maneuvering diagrams that demonstrate how the site can accommodate up to a WB-67 truck.



Emergency vehicle access would be provided via Searsville Road to Fremont Road. Fremont Road is a 24-foot curb-to-curb roadway, meeting the 20-foot minimum fire lane width. In addition, the Project site driveway will be 32 feet wide at its connection with Fremont Road, transitioning to a 24-foot travel way and a 12-foot parallel truck parking lane adjacent to the north edge of the building. The driveway terminates in a 50-foot radius turnaround, effectively providing fire lane access along the building's north and west faces.



## 4. Findings

The traffic operations analysis indicates that the intersections in the immediate vicinity of the Project site would continue to operate well, at LOS C or better. No intersection improvements are needed to serve the traffic changes with the Project. The Project design incorporates pedestrian improvements to facilitate pedestrian trips between the new building and other campus destinations. Bicycle access to the site will be via Fremont Road. Several Marguerite stops are located within a quarter-mile to a third of a mile from the Project site. The site has been designed to accommodate a WB-67 truck, both on the LBRE Replacement Building site and to and from the Electioneer Road shed. Emergency access is adequately provided via Fremont Road.



# Appendix A: Traffic Counts

# Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

File Name : 1AM FINAL  
Site Code : 00000001  
Start Date : 5/29/2019  
Page No : 1

## Groups Printed- Lights - Buses - Trucks

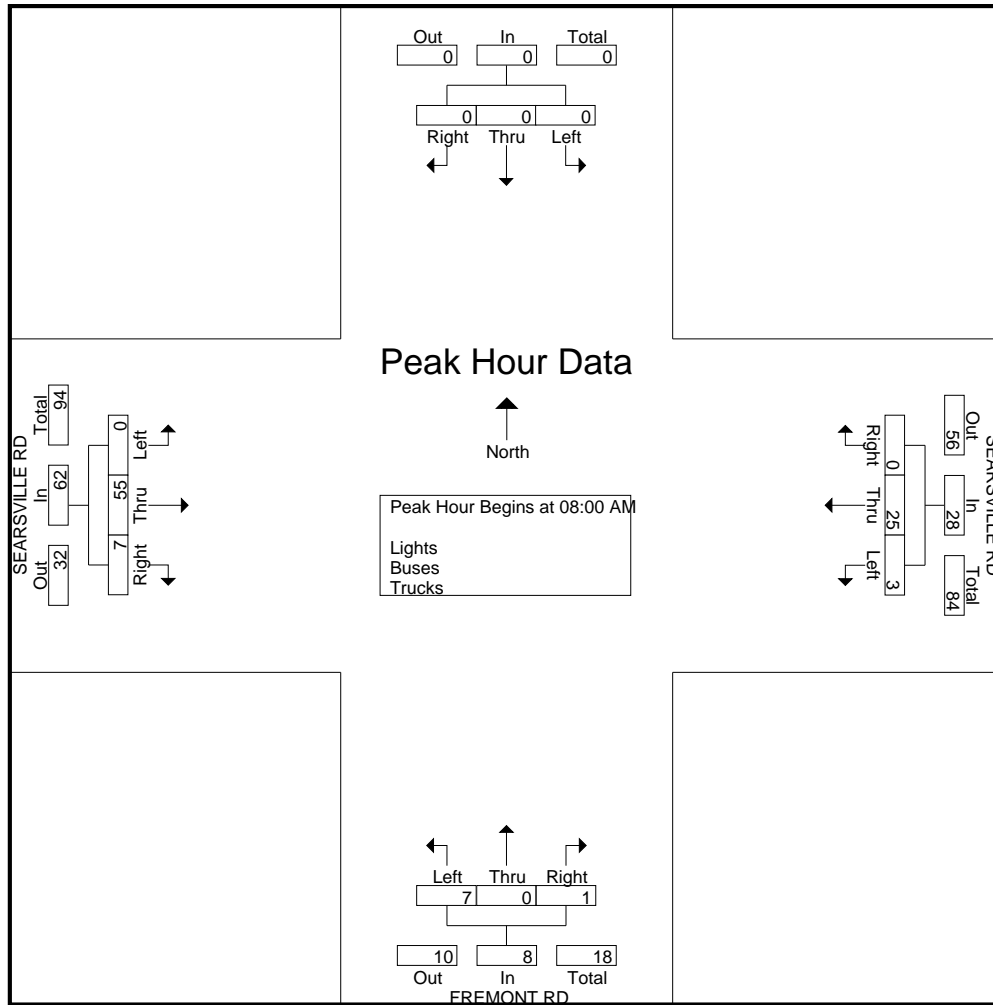
	Southbound					SEARSVILLE RD Westbound					FREMONT RD Northbound					SEARSVILLE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	3	1	1	5	1	0	1	3	5	1	10	0	1	12	22
07:15 AM	0	0	0	0	0	0	3	2	1	6	1	0	3	3	7	3	16	0	1	20	33
07:30 AM	0	0	0	0	0	0	2	0	1	3	1	0	2	9	12	2	9	0	2	13	28
07:45 AM	0	0	0	0	0	0	2	0	1	3	0	0	1	5	6	4	17	0	1	22	31
Total	0	0	0	0	0	0	10	3	4	17	3	0	7	20	30	10	52	0	5	67	114
08:00 AM	0	0	0	0	0	0	7	1	0	8	1	0	1	2	4	4	14	0	0	18	30
08:15 AM	0	0	0	0	0	0	7	0	0	7	0	0	3	2	5	1	12	0	0	13	25
08:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	11	12	2	14	0	3	19	36
08:45 AM	0	0	0	0	0	0	6	2	0	8	0	0	2	7	9	0	15	0	0	15	32
Total	0	0	0	0	0	0	25	3	0	28	1	0	7	22	30	7	55	0	3	65	123
Grand Total	0	0	0	0	0	0	35	6	4	45	4	0	14	42	60	17	107	0	8	132	237
Apprch %	0	0	0	0	0	0	77.8	13.3	8.9	6.7	0	23.3	70	12.9	81.1	0	6.1	0	0	0	0
Total %	0	0	0	0	0	0	14.8	2.5	1.7	1.7	0	5.9	17.7	25.3	7.2	45.1	0	3.4	55.7	0	0
Lights	0	0	0	0	0	0	35	5	4	44	4	0	13	42	59	16	104	0	8	128	231
% Lights	0	0	0	0	0	0	100	83.3	100	97.8	100	0	92.9	100	98.3	94.1	97.2	0	100	97	97.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8	0	0	2.3	1.3
Trucks	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	1	3
% Trucks	0	0	0	0	0	0	0	16.7	0	2.2	0	0	7.1	0	1.7	5.9	0	0	0	0.8	1.3

	Southbound				SEARSVILLE RD Westbound				FREMONT RD Northbound				SEARSVILLE RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	7	1	8	1	0	1	2	4	14	0	18	28
08:15 AM	0	0	0	0	0	7	0	7	0	0	3	3	1	12	0	13	23
08:30 AM	0	0	0	0	0	5	0	5	0	0	1	1	2	14	0	16	22
08:45 AM	0	0	0	0	0	6	2	8	0	0	2	2	0	15	0	15	25
Total Volume	0	0	0	0	0	25	3	28	1	0	7	8	7	55	0	62	98
% App. Total	0	0	0		0	89.3	10.7		12.5	0	87.5		11.3	88.7	0		
PHF	.000	.000	.000	.000	.000	.893	.375	.875	.250	.000	.583	.667	.438	.917	.000	.861	.875

# Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

File Name : 1AM FINAL  
Site Code : 00000001  
Start Date : 5/29/2019  
Page No : 2





# Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

File Name : 1PM FINAL  
Site Code : 00000001  
Start Date : 5/29/2019  
Page No : 1

## Groups Printed- Lights - Buses - Trucks

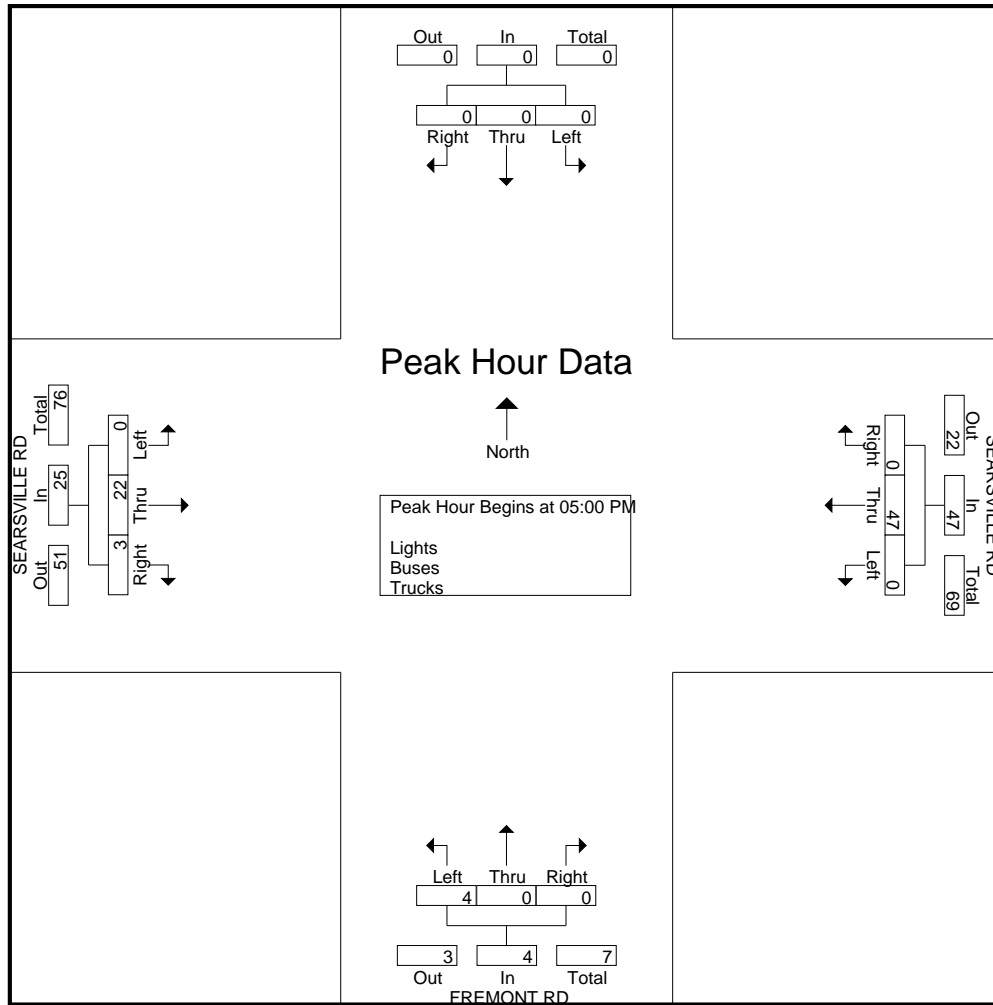
	Southbound					SEARSVILLE RD Westbound					FREMONT RD Northbound					SEARSVILLE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	9	2	2	13	0	0	1	6	7	3	2	0	1	6	26
04:15 PM	0	0	0	0	0	0	7	0	0	7	2	0	1	6	9	4	8	0	0	12	28
04:30 PM	0	0	0	0	0	0	9	1	1	11	0	0	0	6	6	1	2	0	0	3	20
04:45 PM	0	0	0	0	0	0	6	2	0	8	0	0	1	4	5	2	4	0	0	6	19
Total	0	0	0	0	0	0	31	5	3	39	2	0	3	22	27	10	16	0	1	27	93
05:00 PM	0	0	0	0	0	0	12	0	0	12	0	0	1	4	5	0	8	0	1	9	26
05:15 PM	0	0	0	0	0	0	15	0	0	15	0	0	0	5	5	1	5	0	1	7	27
05:30 PM	0	0	0	0	0	0	11	0	0	11	0	0	1	4	5	1	2	0	0	3	19
05:45 PM	0	0	0	0	0	0	9	0	0	9	0	0	2	6	8	1	7	0	1	9	26
Total	0	0	0	0	0	0	47	0	0	47	0	0	4	19	23	3	22	0	3	28	98
Grand Total	0	0	0	0	0	0	78	5	3	86	2	0	7	41	50	13	38	0	4	55	191
Apprch %	0	0	0	0		0	90.7	5.8	3.5		4	0	14	82		23.6	69.1	0	7.3		
Total %	0	0	0	0	0	0	40.8	2.6	1.6	45	1	0	3.7	21.5	26.2	6.8	19.9	0	2.1	28.8	
Lights	0	0	0	0	0	0	76	5	3	84	2	0	7	41	50	13	34	0	4	51	185
% Lights	0	0	0	0	0	0	97.4	100	100	97.7	100	0	100	100	100	100	89.5	0	100	92.7	96.9
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
% Buses	0	0	0	0	0	0	2.6	0	0	2.3	0	0	0	0	0	0	10.5	0	0	7.3	3.1
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Southbound					SEARSVILLE RD Westbound					FREMONT RD Northbound					SEARSVILLE RD Eastbound					
Start Time	Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0		0	12	0	12		0	0	1	1		0	8	0	8		21
05:15 PM	0	0	0	0		0	15	0	15		0	0	0	0		1	5	0	6		21
05:30 PM	0	0	0	0		0	11	0	11		0	0	1	1		1	2	0	3		15
05:45 PM	0	0	0	0		0	9	0	9		0	0	2	2		1	7	0	8		19
Total Volume	0	0	0	0		0	47	0	47		0	0	4	4		3	22	0	25		76
% App. Total	0	0	0			0	100	0			0	0	100			12	88	0			
PHF	.000	.000	.000	.000		.000	.783	.000	.783		.000	.000	.500	.500		.750	.688	.000	.781		.905

# Traffic Data Service

San Jose, CA  
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File Name : 1PM FINAL  
Site Code : 00000001  
Start Date : 5/29/2019  
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# Traffic Data Service

San Jose, CA  
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tdsbay@cs.com

File Name : 2AM FINAL  
Site Code : 00000002  
Start Date : 5/29/2019  
Page No : 1

## Groups Printed- Lights - Buses - Trucks

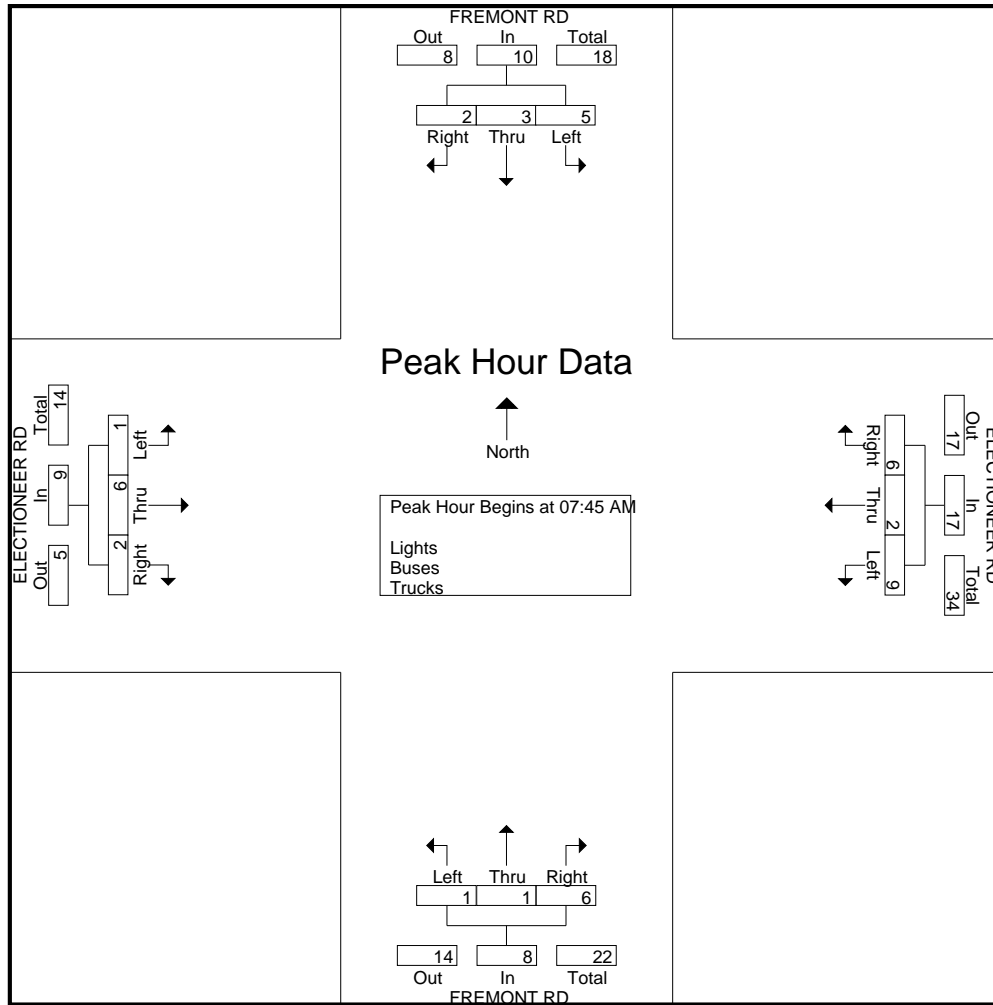
	FREMONT RD Southbound					ELECTIONEER RD Westbound					FREMONT RD Northbound					ELECTIONEER RD Eastbound						
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total	
07:00 AM	0	0	1	0	1	2	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	4
07:15 AM	1	3	3	0	7	1	0	0	0	1	0	0	0	0	0	0	2	3	0	0	5	13
07:30 AM	0	0	2	0	2	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	6
07:45 AM	0	1	3	0	4	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	0	7
Total	1	4	9	0	14	7	2	0	0	9	1	0	0	0	1	0	3	3	0	6	30	
08:00 AM	1	1	2	0	4	1	0	2	0	3	3	0	0	0	3	0	1	1	0	2	12	
08:15 AM	0	0	0	0	0	2	1	5	0	8	2	1	0	0	3	1	2	0	0	3	14	
08:30 AM	1	1	0	0	2	2	0	2	0	4	0	0	1	2	3	1	3	0	0	4	13	
08:45 AM	1	0	1	0	2	2	0	1	0	3	0	1	0	0	1	0	1	0	0	1	7	
Total	3	2	3	0	8	7	1	10	0	18	5	2	1	2	10	2	7	1	0	10	46	
Grand Total	4	6	12	0	22	14	3	10	0	27	6	2	1	2	11	2	10	4	0	16	76	
Apprch %	18.2	27.3	54.5	0		51.9	11.1	37	0		54.5	18.2	9.1	18.2		12.5	62.5	25	0			
Total %	5.3	7.9	15.8	0	28.9	18.4	3.9	13.2	0	35.5	7.9	2.6	1.3	2.6	14.5	2.6	13.2	5.3	0	21.1		
Lights	4	6	9	0	19	13	1	10	0	24	6	2	0	2	10	1	5	3	0	9	62	
% Lights	100	100	75	0	86.4	92.9	33.3	100	0	88.9	100	100	0	100	90.9	50	50	75	0	56.2	81.6	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Trucks	0	0	3	0	3	1	2	0	0	3	0	0	1	0	1	1	5	1	0	7	14	
% Trucks	0	0	25	0	13.6	7.1	66.7	0	0	11.1	0	0	100	0	9.1	50	50	25	0	43.8	18.4	

	FREMONT RD Southbound				ELECTIONEER RD Westbound				FREMONT RD Northbound				ELECTIONEER RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	1	3	4	1	1	0	2	1	0	0	1	0	0	0	0	7
08:00 AM	1	1	2	4	1	0	2	3	3	0	0	3	0	1	1	2	12
08:15 AM	0	0	0	0	2	1	5	8	2	1	0	3	1	2	0	3	14
08:30 AM	1	1	0	2	2	0	2	4	0	0	1	1	1	3	0	4	11
Total Volume	2	3	5	10	6	2	9	17	6	1	1	8	2	6	1	9	44
% App. Total	20	30	50		35.3	11.8	52.9		75	12.5	12.5		22.2	66.7	11.1		
PHF	.500	.750	.417	.625	.750	.500	.450	.531	.500	.250	.250	.667	.500	.500	.250	.563	.786

# Traffic Data Service

San Jose, CA  
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File Name : 2AM FINAL  
Site Code : 00000002  
Start Date : 5/29/2019  
Page No : 2



# Traffic Data Service

San Jose, CA  
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File Name : 2PM FINAL  
Site Code : 00000002  
Start Date : 5/29/2019  
Page No : 1

## Groups Printed- Lights - Buses - Trucks

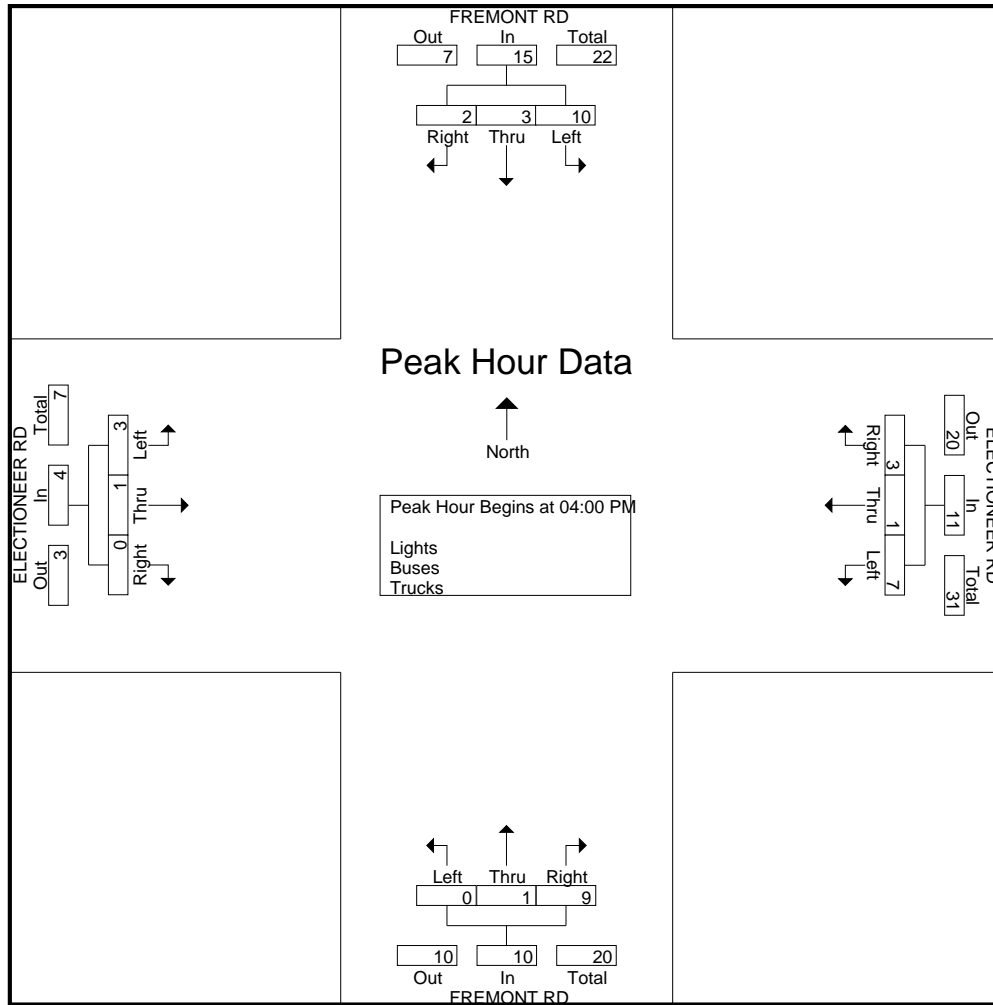
	FREMONT RD Southbound					ELECTIONEER RD Westbound					FREMONT RD Northbound					ELECTIONEER RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	1	2	0	3	0	0	3	0	3	0	0	0	0	0	0	0	2	0	2	8
04:15 PM	0	2	4	0	6	2	0	1	0	3	1	0	0	0	1	0	1	0	0	1	11
04:30 PM	1	0	2	0	3	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	5
04:45 PM	1	0	2	0	3	1	1	3	0	5	7	1	0	0	8	0	0	0	0	0	16
Total	2	3	10	0	15	3	1	7	0	11	9	1	0	0	10	0	1	3	0	4	40
05:00 PM	0	0	0	0	0	1	0	1	2	4	2	0	0	1	3	0	2	0	0	2	9
05:15 PM	0	0	1	0	1	1	0	1	0	2	2	0	0	0	2	0	0	0	0	0	5
05:30 PM	0	1	2	0	3	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	5
05:45 PM	0	0	1	0	1	0	0	0	0	0	3	2	0	0	5	0	0	0	0	0	6
Total	0	1	4	0	5	3	0	3	2	8	7	2	0	1	10	0	2	0	0	2	25
Grand Total	2	4	14	0	20	6	1	10	2	19	16	3	0	1	20	0	3	3	0	6	65
Apprch %	10	20	70	0		31.6	5.3	52.6	10.5		80	15	0	5		0	50	50	0		
Total %	3.1	6.2	21.5	0	30.8	9.2	1.5	15.4	3.1	29.2	24.6	4.6	0	1.5	30.8	0	4.6	4.6	0	9.2	
Lights	2	4	14	0	20	6	1	10	2	19	16	3	0	1	20	0	3	3	0	6	65
% Lights	100	100	100	0	100	100	100	100	100	100	100	100	0	100	100	0	100	100	0	100	100
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	FREMONT RD Southbound				ELECTIONEER RD Westbound				FREMONT RD Northbound				ELECTIONEER RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	2	3	0	0	3	3	0	0	0	0	0	0	2	2	8
04:15 PM	0	2	4	6	2	0	1	3	1	0	0	1	0	1	0	1	11
04:30 PM	1	0	2	3	0	0	0	0	1	0	0	1	0	0	1	1	5
04:45 PM	1	0	2	3	1	1	3	5	7	1	0	8	0	0	0	0	16
Total Volume	2	3	10	15	3	1	7	11	9	1	0	10	0	1	3	4	40
% App. Total	13.3	20	66.7		27.3	9.1	63.6		90	10	0		0	25	75		
PHF	.500	.375	.625	.625	.375	.250	.583	.550	.321	.250	.000	.313	.000	.250	.375	.500	.625

# Traffic Data Service

San Jose, CA  
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File Name : 2PM FINAL  
Site Code : 00000002  
Start Date : 5/29/2019  
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# Traffic Data Service

San Jose, CA  
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tdsbay@cs.com

File Name : 3AM FINAL  
Site Code : 00000003  
Start Date : 5/29/2019  
Page No : 1

Groups Printed- Lights - Buses - Trucks

	CAMPUS DR Southbound					Westbound					CAMPUS DR Northbound					ELECTIONEER RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	27	0	0	28	0	0	0	0	0	0	117	2	0	119	0	0	2	0	2	149
07:15 AM	1	34	0	0	35	0	0	0	0	0	0	170	4	0	174	0	0	2	0	2	211
07:30 AM	1	58	0	0	59	0	0	0	0	0	0	175	5	0	180	3	0	1	0	4	243
07:45 AM	3	74	0	0	77	0	0	0	0	0	0	138	6	2	146	5	0	2	1	8	231
Total	6	193	0	0	199	0	0	0	0	0	0	600	17	2	619	8	0	7	1	16	834
08:00 AM	0	35	0	0	35	0	0	0	0	0	0	168	6	0	174	4	0	2	0	6	215
08:15 AM	5	26	0	0	31	0	0	0	0	0	0	171	2	2	175	4	0	4	0	8	214
08:30 AM	2	29	1	0	32	0	0	0	0	0	0	159	2	3	164	1	0	3	0	4	200
08:45 AM	3	25	0	0	28	0	0	0	0	0	0	171	3	2	176	2	0	2	0	4	208
Total	10	115	1	0	126	0	0	0	0	0	0	669	13	7	689	11	0	11	0	22	837
Grand Total	16	308	1	0	325	0	0	0	0	0	0	1269	30	9	1308	19	0	18	1	38	1671
Apprch %	4.9	94.8	0.3	0		0	0	0	0		0	97	2.3	0.7		50	0	47.4	2.6		
Total %	1	18.4	0.1	0	19.4	0	0	0	0	0	0	75.9	1.8	0.5	78.3	1.1	0	1.1	0.1	2.3	
Lights	10	292	1	0	303	0	0	0	0	0	0	1254	30	9	1293	17	0	11	1	29	1625
% Lights	62.5	94.8	100	0	93.2	0	0	0	0	0	0	98.8	100	100	98.9	89.5	0	61.1	100	76.3	97.2
Buses	0	12	0	0	12	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	18
% Buses	0	3.9	0	0	3.7	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	1.1
Trucks	6	4	0	0	10	0	0	0	0	0	0	9	0	0	9	2	0	7	0	9	28
% Trucks	37.5	1.3	0	0	3.1	0	0	0	0	0	0	0.7	0	0	0.7	10.5	0	38.9	0	23.7	1.7

	CAMPUS DR Southbound				Westbound				CAMPUS DR Northbound				ELECTIONEER RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	58	0	59	0	0	0	0	0	175	5	180	3	0	1	4	243
07:45 AM	3	74	0	77	0	0	0	0	0	138	6	144	5	0	2	7	228
08:00 AM	0	35	0	35	0	0	0	0	0	168	6	174	4	0	2	6	215
08:15 AM	5	26	0	31	0	0	0	0	0	171	2	173	4	0	4	8	212
Total Volume	9	193	0	202	0	0	0	0	0	652	19	671	16	0	9	25	898
% App. Total	4.5	95.5	0		0	0	0		0	97.2	2.8		64	0	36		
PHF	.450	.652	.000	.656	.000	.000	.000	.000	.000	.931	.792	.932	.800	.000	.563	.781	.924

# Traffic Data Service

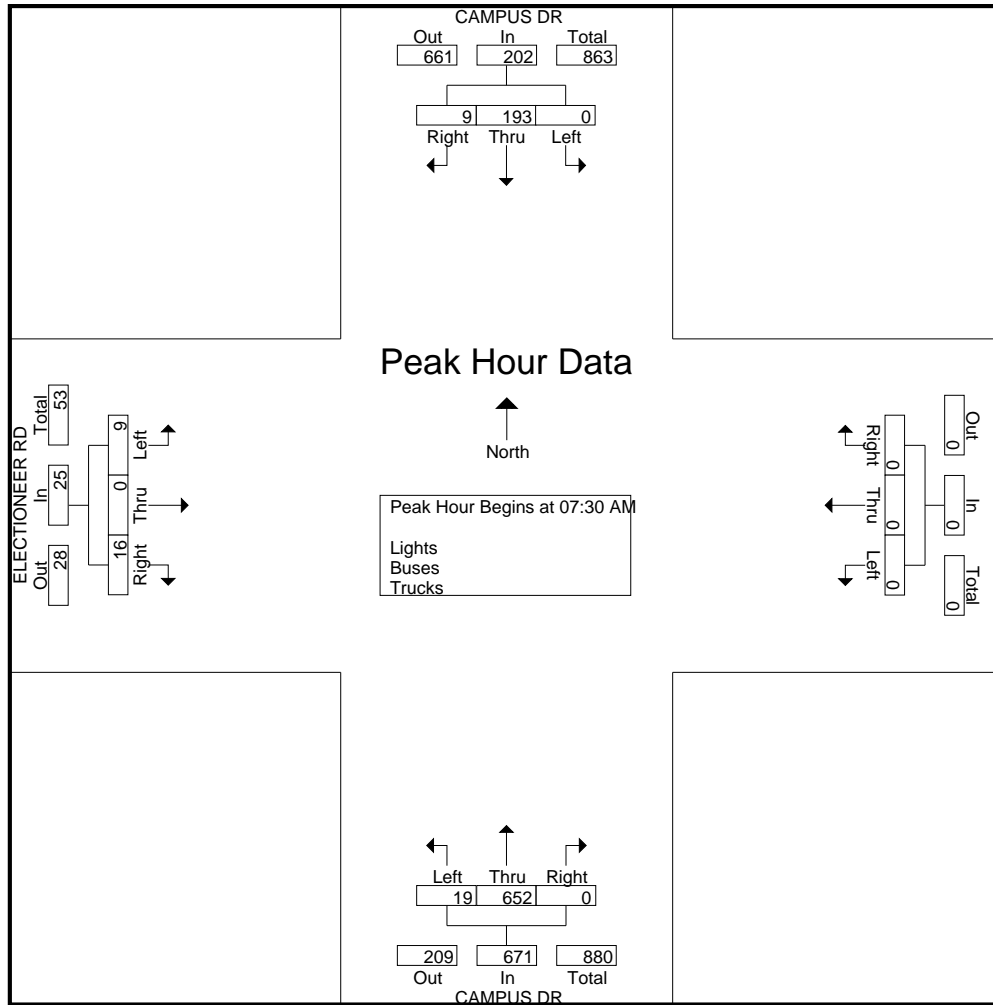
San Jose, CA  
(408) 622-4787  
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File Name : 3AM FINAL

Site Code : 00000003

Start Date : 5/29/2019

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# Traffic Data Service

San Jose, CA  
(408) 622-4787  
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File Name : 3PM FINAL  
Site Code : 00000003  
Start Date : 5/29/2019  
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Groups Printed- Lights - Buses - Trucks

	CAMPUS DR Southbound					Westbound					CAMPUS DR Northbound					ELECTIONEER RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	139	0	0	139	0	0	0	0	0	0	55	7	2	64	1	0	2	0	3	206
04:15 PM	5	158	0	0	163	0	0	0	0	0	0	57	2	0	59	5	0	4	1	10	232
04:30 PM	3	194	0	0	197	0	0	0	0	0	0	63	0	1	64	3	0	3	0	6	267
04:45 PM	4	177	0	0	181	0	0	0	0	0	0	68	4	1	73	9	0	1	1	11	265
Total	12	668	0	0	680	0	0	0	0	0	0	243	13	4	260	18	0	10	2	30	970
05:00 PM	4	181	0	0	185	0	0	0	0	0	0	58	3	2	63	6	0	1	3	10	258
05:15 PM	6	184	0	0	190	0	0	0	0	0	0	73	2	1	76	4	0	1	1	6	272
05:30 PM	3	196	0	0	199	0	0	0	0	0	0	51	6	4	61	5	0	4	2	11	271
05:45 PM	1	175	0	0	176	0	0	0	0	0	0	85	3	2	90	6	0	2	0	8	274
Total	14	736	0	0	750	0	0	0	0	0	0	267	14	9	290	21	0	8	6	35	1075
Grand Total	26	1404	0	0	1430	0	0	0	0	0	0	510	27	13	550	39	0	18	8	65	2045
Apprch %	1.8	98.2	0	0		0	0	0	0		0	92.7	4.9	2.4		60	0	27.7	12.3		
Total %	1.3	68.7	0	0	69.9	0	0	0	0	0	0	24.9	1.3	0.6	26.9	1.9	0	0.9	0.4	3.2	
Lights	25	1388	0	0	1413	0	0	0	0	0	0	503	27	13	543	39	0	18	8	65	2021
% Lights	96.2	98.9	0	0	98.8	0	0	0	0	0	0	98.6	100	100	98.7	100	0	100	100	100	98.8
Buses	0	10	0	0	10	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	15
% Buses	0	0.7	0	0	0.7	0	0	0	0	0	0	1	0	0	0.9	0	0	0	0	0	0.7
Trucks	1	6	0	0	7	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	9
% Trucks	3.8	0.4	0	0	0.5	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.4

	CAMPUS DR Southbound				Westbound				CAMPUS DR Northbound				ELECTIONEER RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	4	181	0	185	0	0	0	0	0	58	3	61	6	0	1	7	253
05:15 PM	6	184	0	190	0	0	0	0	0	73	2	75	4	0	1	5	270
05:30 PM	3	196	0	199	0	0	0	0	0	51	6	57	5	0	4	9	265
05:45 PM	1	175	0	176	0	0	0	0	0	85	3	88	6	0	2	8	272
Total Volume	14	736	0	750	0	0	0	0	0	267	14	281	21	0	8	29	1060
% App. Total	1.9	98.1	0		0	0	0		0	95	5		72.4	0	27.6		
PHF	.583	.939	.000	.942	.000	.000	.000	.000	.000	.785	.583	.798	.875	.000	.500	.806	.974

# Traffic Data Service

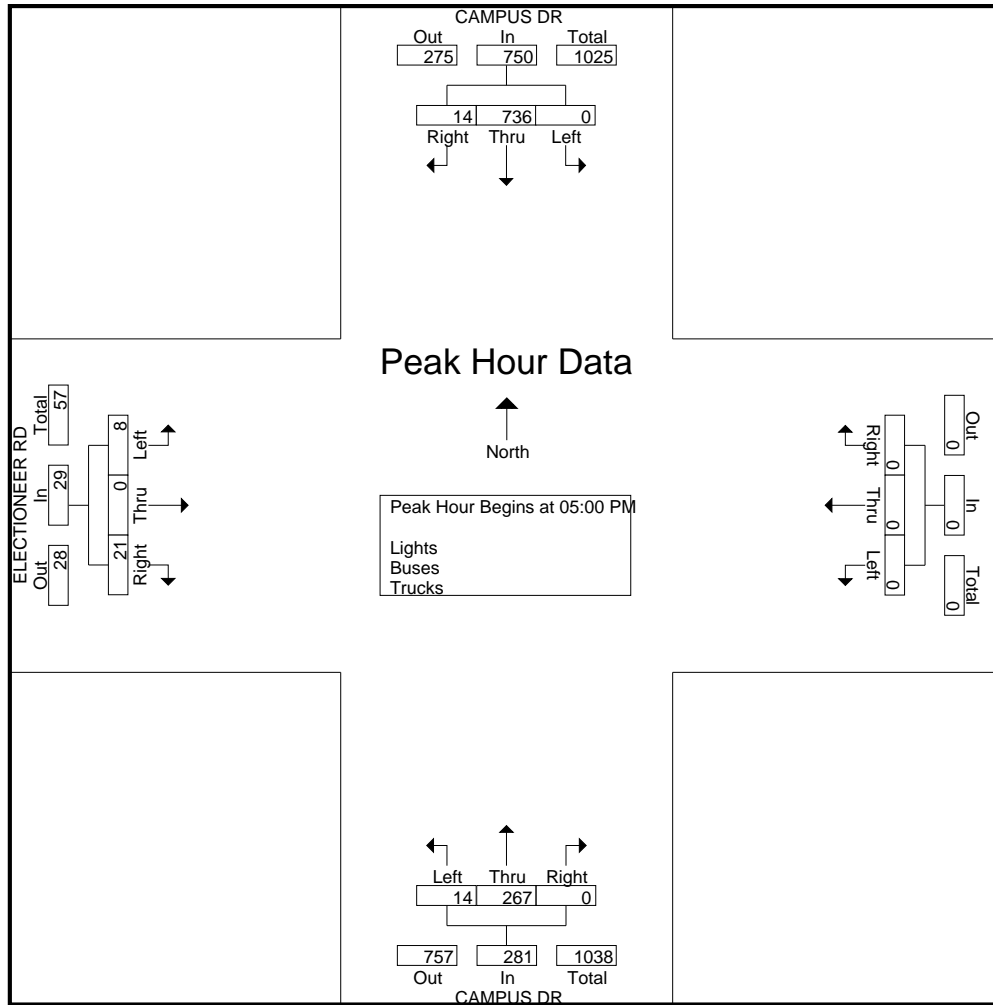
San Jose, CA  
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File Name : 3PM FINAL

Site Code : 00000003

Start Date : 5/29/2019

Page No : 2



## Appendix B: LOS Results

# HCM 6th TWSC

## 1: Fremont Rd & Oak Rd/Searsville Rd

Existing AM

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↕	
Traffic Vol, veh/h	55	7	3	25	7	1
Future Vol, veh/h	55	7	3	25	7	1
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	63	8	3	28	8	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	71	0	101	70
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	34	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1523	-	895	990
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	986	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	893	987
Mov Cap-2 Maneuver	-	-	-	-	893	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	986	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	904	-	-	1523	-	
HCM Lane V/C Ratio	0.01	-	-	0.002	-	
HCM Control Delay (s)	9	-	-	7.4	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th AWSC  
2: Fremont Rd & Electioneer Rd

Existing AM

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	6	2	9	2	6	1	1	6	5	3	2
Future Vol, veh/h	1	6	2	9	2	6	1	1	6	5	3	2
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	1	8	3	11	3	8	1	1	8	6	4	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0




Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.3	6.9	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	11%	53%	50%
Vol Thru, %	12%	67%	12%	30%
Vol Right, %	75%	22%	35%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	9	17	10
LT Vol	1	1	9	5
Through Vol	1	6	2	3
RT Vol	6	2	6	2
Lane Flow Rate	10	11	22	13
Geometry Grp	1	1	1	1
Degree of Util (X)	0.011	0.013	0.025	0.015
Departure Headway (Hd)	3.881	4.184	4.182	4.284
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	923	857	858	837
Service Time	1.902	2.201	2.196	2.304
HCM Lane V/C Ratio	0.011	0.013	0.026	0.016
HCM Control Delay	6.9	7.3	7.3	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

# HCM 6th TWSC




## 3: Campus Dr & Electioneer Rd

Existing AM

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	16	19	652	193	9
Future Vol, veh/h	9	16	19	652	193	9
Conflicting Peds, #/hr	4	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	10	17	21	709	210	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	970	215	220	0	-	0
Stage 1	215	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	280	822	1343	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	273	822	1343	-	-	-
Mov Cap-2 Maneuver	273	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1343	-	477	-	-	
HCM Lane V/C Ratio	0.015	-	0.057	-	-	
HCM Control Delay (s)	7.7	0	13	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 6th TWSC  
1: Fremont Rd & Oak Rd/Searsville Rd

Existing PM

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	22	3	0	47	4	0
Future Vol, veh/h	22	3	0	47	4	0
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	24	3	0	52	4	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	27	0	78	29
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1568	-	917	1037
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1568	-	917	1034
Mov Cap-2 Maneuver	-	-	-	-	917	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	963	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		8.9	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	917	-	-	1568	-	
HCM Lane V/C Ratio	0.005	-	-	-	-	
HCM Control Delay (s)	8.9	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th AWSC  
2: Fremont Rd & Electioneer Rd

Existing PM

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	1	0	7	1	3	0	1	9	10	3	2
Future Vol, veh/h	3	1	0	7	1	3	0	1	9	10	3	2
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	2	0	11	2	5	0	2	15	16	5	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0




Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.1	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	75%	64%	67%
Vol Thru, %	10%	25%	9%	20%
Vol Right, %	90%	0%	27%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	4	11	15
LT Vol	0	3	7	10
Through Vol	1	1	1	3
RT Vol	9	0	3	2
Lane Flow Rate	16	6	18	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.008	0.02	0.027
Departure Headway (Hd)	3.472	4.185	3.99	4.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1032	857	899	884
Service Time	1.488	2.202	2.005	2.073
HCM Lane V/C Ratio	0.016	0.007	0.02	0.027
HCM Control Delay	6.5	7.2	7.1	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1



HCM 6th TWSC  
3: Campus Dr & Electioneer Rd

Existing PM

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	21	14	267	736	14
Future Vol, veh/h	8	21	14	267	736	14
Conflicting Peds, #/hr	9	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	8	22	14	275	759	14
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1078	766	773	0	-	0
Stage 1	766	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	241	401	838	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	236	401	838	-	-	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.8	0.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	838	-	336	-	-	
HCM Lane V/C Ratio	0.017	-	0.089	-	-	
HCM Control Delay (s)	9.4	0	16.8	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-	

HCM 6th TWSC  
1: Fremont Rd & Oak Rd/Searsville Rd





Existing plus Project - AM

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↖	↗
Traffic Vol, veh/h	55	9	9	25	9	7
Future Vol, veh/h	55	9	9	25	9	7
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	16	16	16	16	16	16
Mvmt Flow	63	10	10	28	10	8
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	73	0	116	71
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	-	-	4.26	-	6.56	6.36
Critical Hdwy Stg 1	-	-	-	-	5.56	-
Critical Hdwy Stg 2	-	-	-	-	5.56	-
Follow-up Hdwy	-	-	2.344	-	3.644	3.444
Pot Cap-1 Maneuver	-	-	1442	-	848	954
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1442	-	842	951
Mov Cap-2 Maneuver	-	-	-	-	842	-
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	940	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2		9.1	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	886	-	-	1442	-	
HCM Lane V/C Ratio	0.021	-	-	0.007	-	
HCM Control Delay (s)	9.1	-	-	7.5	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 6th AWSC  
2: Fremont Rd & Electioneer Rd

Existing plus Project - AM

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	6	2	9	2	6	1	1	6	5	3	2
Future Vol, veh/h	1	6	2	9	2	6	1	1	6	5	3	2
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	1	8	3	11	3	8	1	1	8	6	4	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0




Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.3	6.9	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	11%	53%	50%
Vol Thru, %	12%	67%	12%	30%
Vol Right, %	75%	22%	35%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	9	17	10
LT Vol	1	1	9	5
Through Vol	1	6	2	3
RT Vol	6	2	6	2
Lane Flow Rate	10	11	22	13
Geometry Grp	1	1	1	1
Degree of Util (X)	0.011	0.013	0.025	0.015
Departure Headway (Hd)	3.881	4.184	4.182	4.284
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	923	857	858	837
Service Time	1.902	2.201	2.196	2.304
HCM Lane V/C Ratio	0.011	0.013	0.026	0.016
HCM Control Delay	6.9	7.3	7.3	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

# HCM 6th TWSC

## 3: Campus Dr & Electioneer Rd

Existing plus Project - AM

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	16	19	653	194	9
Future Vol, veh/h	9	16	19	653	194	9
Conflicting Peds, #/hr	4	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	10	17	21	710	211	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	972	216	221	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	279	821	1342	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	821	1342	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1342	-	475	-	-	
HCM Lane V/C Ratio	0.015	-	0.057	-	-	
HCM Control Delay (s)	7.7	0	13	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	




# HCM 6th TWSC

## 1: Fremont Rd & Oak Rd/Searsville Rd

Existing plus Project - PM

### Intersection

Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	22	5	6	47	6	6
Future Vol, veh/h	22	5	6	47	6	6
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21
Mvmt Flow	24	6	7	52	7	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	30
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.31
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.389
Pot Cap-1 Maneuver	-	-	1468
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1468
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	919	-	-	1468	-
HCM Lane V/C Ratio	0.015	-	-	0.005	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th AWSC  
2: Fremont Rd & Electioneer Rd

Existing plus Project - PM

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	1	0	7	1	3	0	1	9	10	3	2
Future Vol, veh/h	3	1	0	7	1	3	0	1	9	10	3	2
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	2	0	11	2	5	0	2	15	16	5	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.1	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	75%	64%	67%
Vol Thru, %	10%	25%	9%	20%
Vol Right, %	90%	0%	27%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	4	11	15
LT Vol	0	3	7	10
Through Vol	1	1	1	3
RT Vol	9	0	3	2
Lane Flow Rate	16	6	18	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.008	0.02	0.027
Departure Headway (Hd)	3.472	4.185	3.99	4.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1032	857	899	884
Service Time	1.488	2.202	2.005	2.073
HCM Lane V/C Ratio	0.016	0.007	0.02	0.027
HCM Control Delay	6.5	7.2	7.1	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1

# HCM 6th TWSC 3: Campus Dr & Electioneer Rd

Existing plus Project - PM

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	21	14	268	737	14
Future Vol, veh/h	8	21	14	268	737	14
Conflicting Peds, #/hr	9	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	8	22	14	276	760	14
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1080	767	774	0	-	0
Stage 1	767	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	240	401	837	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	235	401	837	-	-	-
Mov Cap-2 Maneuver	235	-	-	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.8	0.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	837	-	336	-	-	
HCM Lane V/C Ratio	0.017	-	0.089	-	-	
HCM Control Delay (s)	9.4	0	16.8	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-	