4.6 TRANSPORTATION AND TRAFFIC

This section of the EIR summarizes applicable technical components of the *Moffett Place Transportation Impact Analysis Study* (TIA) completed by Fehr & Peers in August 2013, and included as Appendix E of this EIR. The TIA is a stand-alone, separate document, which presents additional technical information on transportation impacts associated with implementation of the proposed Project. The TIA was prepared following the guidelines of the City of Sunnyvale and Santa Clara Valley Transportation Authority (VTA), the congestion management agency for Santa Clara County.

4.6.1 ENVIRONMENTAL SETTING

This section describes the existing conditions of the roadway facilities, pedestrian and bicycle facilities, and transit service. It also presents existing traffic volumes and operations for the study intersections and freeway segments with the results of level of service calculations.

EXISTING ROADWAY NETWORK

State Route 237 (SR 237), US 101, Lawrence Expressway and Central Expressway provide regional access to the Project site. The following streets provide local access to the Project sites: Mathilda Avenue, Moffett Park Drive, Innovation Way, 5th Avenue, Java Drive, Caribbean Drive, Crossman Avenue and Fair Oaks Avenue. Descriptions of these roadways are presented below. Figure 4.6-1 shows the locations of these facilities in relation to the Project site.

SR 237 is located immediately south of the Project site and provides regional freeway access between the Cities of Mountain View and Milpitas. SR 237 is an east-west freeway with two mixed-flow lanes in each direction. High occupancy vehicle (HOV) lanes are provided in each direction of SR 237 east of Mathilda Avenue. HOV lanes, also known as diamond or carpool lanes restrict use to vehicles with two or more persons (carpool, vanpool, and buses) or motorcycles during the morning (5:00 AM to 9:00 AM) and evening (3:00 PM to 7:00 PM) commute periods. Access from SR 237 is provided via its interchanges with US 101, Mathilda Avenue, Fair Oaks Avenue, and Lawrence Expressway. Near the Project site, SR 237 has an average daily traffic (ADT) volume of approximately 90,000 vehicles.

US 101 extends north through San Francisco and south through San Jose. Near the Project site, US 101 travels in an east-west direction with approximately 140,000 daily vehicles. The freeway has three mixed-flow lanes and one HOV lane in each direction. Similar to SR 237, interchanges at Ellis Street, Mathilda Avenue, Fair Oaks Avenue, and Lawrence Expressway provide local access to the project site.

Central Expressway is a divided four-lane east-west expressway between San Antonio Road in the City of Mountain View and De La Cruz Boulevard in the City of Santa Clara. West of San Antonio Road, Central Expressway continues to Menlo Park as Alma Road. Central Expressway provides local access to the site via interchanges at Mary Avenue, Mathilda Avenue, Fair Oaks Avenue, Wolfe Road, and Lawrence Expressway. Near the Project site, Central Expressway carries about 21,000 daily vehicles.

Lawrence Expressway is a divided eight-lane north-south expressway in the connecting between Saratoga Avenue to the south and SR 237 to the north. Lawrence Expressway continues north as East Caribbean Drive and to the south, it is a continuation of Quito Road. Lawrence Expressway provides region north-south access throughout the City of Sunnyvale.

Mathilda Avenue is a major six-lane north-south arterial that also provides regional access to SR 237 and US 101. North of SR 237, Mathilda Avenue connects to Caribbean Drive, which is the extension of Lawrence Expressway. To the south, Mathilda Avenue passes through central Sunnyvale and becomes Sunnyvale-Saratoga Road ultimately connecting to I 280 and SR 85. Mathilda Avenue is one of the City of Sunnyvale's designated truck routes for trucks over three tons in weight. Approximately 45,000 daily vehicles travel on Mathilda Avenue south of SR 237 on an average weekday.

Moffett Park Drive is a two-lane east-west roadway that runs along the southern border of the MPSP. Moffett Park Drive/Manila Drive provides direct regional access to the Project site at the SR 237 interchange and US 101 interchange and has an ADT of approximately 5,000 vehicles. Moffett Park Drive connects to Mathilda Avenue west of the Project area and extends east to Caribbean Drive. No access is provided to Moffett Park Drive west of Mathilda Avenue from the SR 237 westbound off-ramp; vertical delineators currently prevent access to the northbound left-turn lanes.

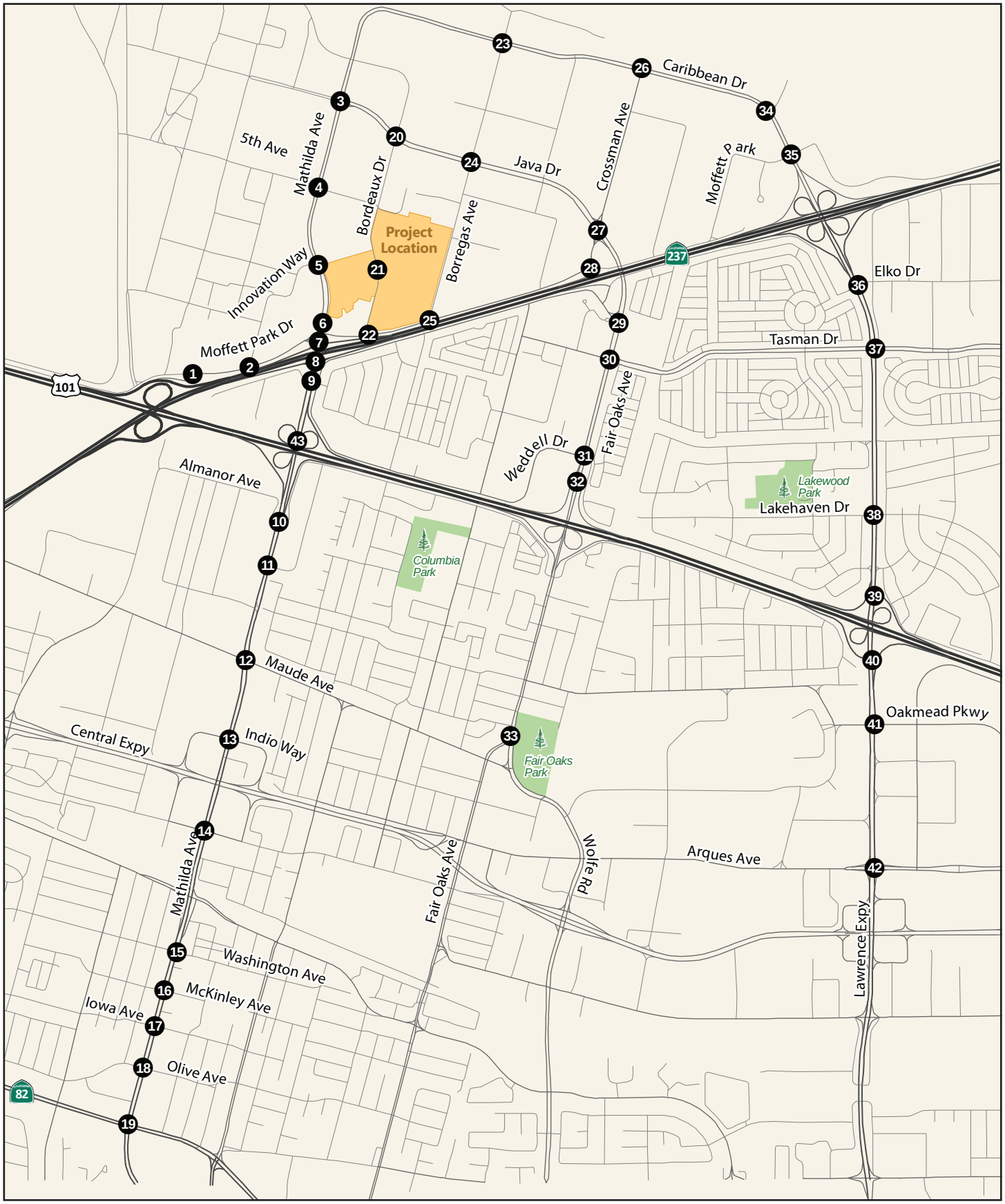
Innovation Way is a four-lane, north-south roadway that extends from Moffett Park Drive to Mathilda Avenue. The proposed new roadway will connect with Innovation Way at the Mathilda Avenue intersection.

Enterprise Way is a four-lane, north-south roadway that borders the Moffett Towers portion of the Project on the west. In the south, Enterprise Way connects to Moffett Park/Manila Drive and provides regional access to US 101 and SR 237 from the site. There is an existing security gate located on Enterprise Way approximately 2,500 feet north of the 11th Avenue intersection (just south of 5th Avenue), which restricts access into the Lockheed Martin complex.

Java Drive is a four-lane, east-west roadway divided by light rail tracks in the City of Sunnyvale. Java Drive extends between SR 237 to the east and North Mathilda Avenue to the west. In the east, Java Drive continues as North Fair Oaks Avenue and in the west it continues as Lockheed Martin Way.

Caribbean Drive is a divided four-lane east-west roadway which is the extension of Lawrence Expressway and continues as Mathilda Avenue to the east in the City of Sunnyvale.

Fair Oaks Avenue is a four to five-lane north-south roadway extending from SR 237 in the north and continuing on as West Remington Drive in the south.



Source: Fehr & Peers, 2013.

1 Study Intersection

FIGURE 4.6-1

Project Location and Study Area

RBF A Baker Company

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CONGESTION MANAGEMENT PROGRAM ROADWAY SYSTEM

The Santa Clara County Congestion Management Program (CMP) designates the roadway system for use in annual monitoring of level of service standards, identifies regionally significant roadways and intersections to be evaluated in land use impacts analyses, and identifies the potential candidates for inclusion in the Regional Transportation Plan capital improvement program. In the City Sunnyvale, the CMP roadway system includes US-101, Route 85, Route 237, Central Expressway, Lawrence Expressway, El Camino Real, Mathilda Avenue, Caribbean Drive and Sunnyvale-Saratoga Road.

PEDESTRIAN FACILITIES

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the vicinity of the Project site, sidewalks are provided on the both sides of Mathilda Avenue along the Project frontage and on the north side of Gibraltar Court. There are no sidewalks on Moffett Park Drive, Bordeaux Drive or Borregas Avenue along the Project frontage, though the City has identified sidewalks on Moffett Park Drive as a future pedestrian improvement. Most study intersections include crosswalks and pedestrian signals on all approaches.

At the Mathilda Avenue/SR 237 interchange, north-south pedestrian movements are limited to the east side of Mathilda Avenue and east-west crossing of Mathilda Avenue is prohibited within the interchange area. Pedestrians crossing Mathilda (east-west) have to use the crosswalk on the north leg of the Mathilda Avenue/Moffett Park Drive intersection. Sidewalks continue on the east side of Mathilda Avenue from the SR 237 interchange to south of the US 101 interchange, at which point, sidewalks continue on both sides of Mathilda Avenue. The City has identified providing sidewalks on both sides of Mathilda Avenue between Moffett Park Drive and US 101 as a future pedestrian improvement and are included in the Traffic Impact Fee (TIF) program.

A multi-use pedestrian/bicycle bridge crosses US 101 east of Mathilda Avenue providing a pedestrian/bicycle connection between Moffett Park to the north and the residential neighborhood to the south. There is currently an uncontrolled crosswalk located on the west leg of the Moffett Park Drive/Borregas Avenue intersection connecting the Project site to the pedestrian bridge; however, there are currently no sidewalks connecting to the crosswalk at any point of the intersection.

BICYCLE FACILITIES

Bikeway planning and design in California typically relies on guidelines and design standards established by California Department of Transportation (Caltrans) in the Highway Design Manual (Chapter 1000: Bikeway Planning and Design). Caltrans provides for three distinct types of bikeway facilities, as described below. Figure 4.6-2 shows the existing bicycle facilities in the City.

- *Class I Bikeway (Bike Path)* provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

- *Class II Bikeway (Bike Lane)* provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.

- *Class III Bikeway (Bike Route)* provides for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.

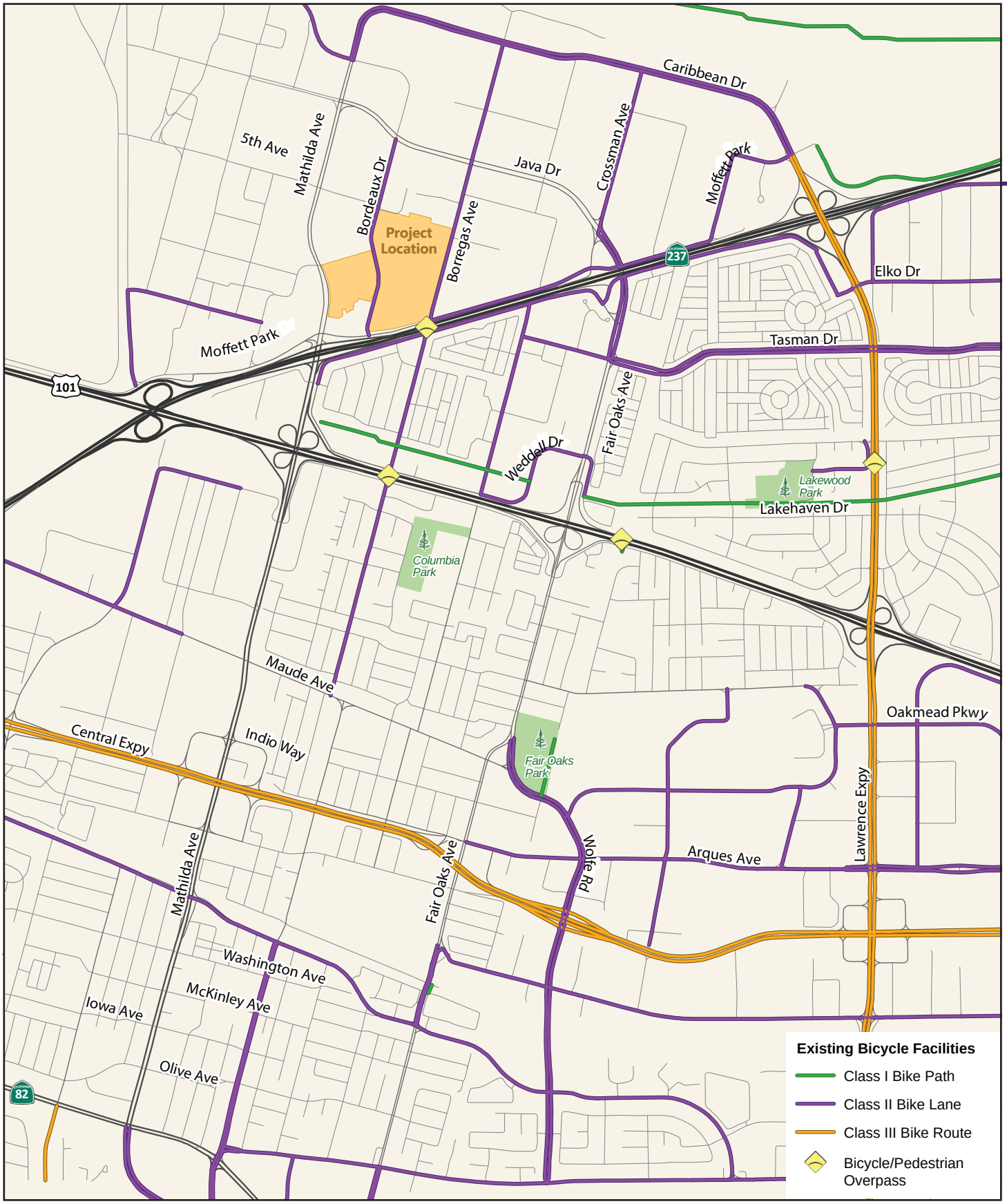
Near the Project site, there are bicycle lanes in both directions provided on both Bordeaux Drive between Moffett Park Drive and Java Drive and Borregas Avenue between Maude Avenue and Caribbean Drive. Bicycle lanes are provided on Mathilda Avenue (north of Bordeaux Drive) and Moffett Park Drive (east of Bordeaux Drive). A bicycle route is designated on Mathilda Avenue from Bordeaux Drive to Innovation. A discontinuous bicycle path extends from Garner Drive to Weddell Drive along the north side of US 101, east of Mathilda Avenue.

Additionally, VTA has adopted the Santa Clara Countywide Bicycle Plan (CBP). The CBP guides the development of major bicycling facilities by identifying Cross County Bicycle Corridors and other projects of countywide or intercity significance. Several of these routes travel through the study area, including routes along Mary Avenue, Maude Avenue, Middlefield Road, Ellis Street, and Manila Drive/Moffett Park Drive.

Pedestrian and bicycle volumes were collected at most study intersections in March 2013. There is moderate bicycle use along Moffett Park Drive during the peak hours; most other bicycle movements have only a few users. Along Mathilda Avenue, pedestrian volumes are low and due to the lack of pedestrian facilities on the Project's frontage streets (Borregas Avenue, Bordeaux Drive, Moffett Park Drive), pedestrian activity is almost non-existent. It does appear that pedestrians only cross at marked crossings at most intersections.

EXISTING TRANSIT SERVICE

The Project site is located near the Lockheed Martin light rail transit (LRT) station, which is on the Mountain View to Winchester Avenue light rail line (line 902) operated by the Santa Clara Valley Transportation Authority (VTA). VTA also operates bus service in the area. Shuttles to Caltrain and Altamont Commuter Express (ACE) stations also serve the Moffett Place Office Development. Figure 4.6-3 shows the existing transit service facilities in the Project area.



Source: Fehr & Peers, 2013.

FIGURE 4.6-2

Existing Bicycle Facilities

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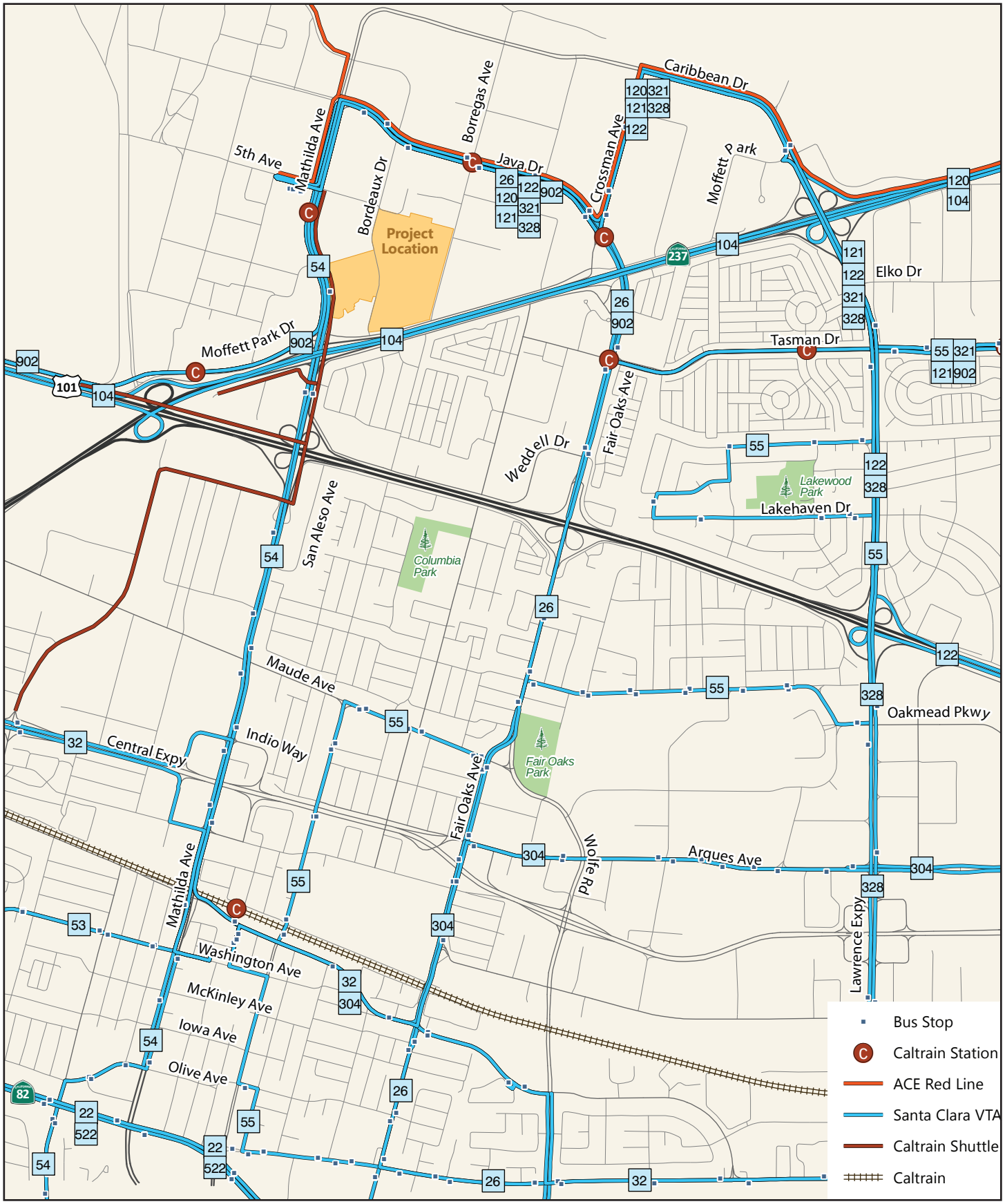

Source: Fehr & Peers, 2013.

FIGURE 4.6-3

Existing Transit Service

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MOFFETT PLACE EIR

VTA LRT and Local Bus Routes

The VTA Mountain View to Winchester Avenue light rail (line 902) runs along Java Drive, Mathilda Avenue, Moffett Park Drive, and Manila Drive near the Project site. This line operates between 4:09 AM and 10:50 PM on 15-minute headways. On weekends, service is provided between 6:54 AM and 10:50 PM with 30-minute headways. LRT Line 902 stops at the Lockheed Martin LRT station, which is within walking distance to the Project site. The Moffett Park station is also in close proximity to the Project site; however, there is no direct pedestrian access from the Project site to the Moffett Park LRT station.

Bus Route 26 operates on Mathilda Avenue, Java Drive, and Fair Oaks Avenue. Route 26 provides service between the Eastridge Mall and Lockheed Martin/Moffett Park transit centers. Route 26 follows major arterials and travels through Sunnyvale, Cupertino, San Jose, and Campbell. During weekdays, Route 26 operates between 5:22 AM and 10:38 PM with 20- to 30-minute headways. On weekends, Route 26 operates between 6:26 AM and 9:37 PM with 30- to 60-minute headways. Bus stops for Route 26 are provided at Java Drive and the Lockheed Martin/Moffett Park Transit Center.

Similar to Bus Route 26, *Bus Route 54* operates on Mathilda Avenue, Java Drive, and Fair Oaks Avenue. Route 54 provides service between De Anza College and Sunnyvale/Fair Oaks Avenue. During weekdays, Route 54 serves the stops near the Project site between 6:01 AM and 8:24 PM with 30-minute headways. On weekends, Route 54 operates between 7:57 AM and 7:25 PM with 45- to 60-minute headways. Bus stops for Route 54 are provided along Mathilda Avenue near Maude Avenue, Ahwanee Avenue, Ross Drive, and north of Moffett Park Drive at the Lockheed Martin/Moffett Park Transit Center.

Additionally, *Bus Route 32* operates on Central Expressway and Mathilda Avenue and could be used as a connection to Bus Route 54. Route 32 provides service between the San Antonio and Santa Clara transit centers. Route 32 follows major arterials and travels through Mountain View, Sunnyvale, and Santa Clara.

Express and Limited Stop Bus Routes

The VTA also runs several express bus routes and limited stop bus routes throughout the Project area.

Bus Route 120 is an express bus route that operates on SR 237, Caribbean Drive, Java Drive, and Mathilda Avenue; it connects Fremont (Fremont BART Station) to the Lockheed Martin Transit Center. Four Route 120 runs occur during each weekday peak period (to the Project area in the morning and from it in the afternoon). The buses arrive between 7:12 AM and 8:28 AM with 15- to 45-minute headways; the same buses leave between 4:05 PM and 6:15 PM with 30- to 40-minute headways.

Bus Route 121 is an express bus route that operates on Lawrence Expressway, Caribbean Drive, Java Drive, and Mathilda Avenue; it connects Gilroy (Gilroy Transit Center) and Morgan Hill (Morgan Hill Caltrain Station) to the Lockheed Martin Transit Center. Seven Route 121 runs occur during each

weekday peak period (to the project area in the morning and from it in the afternoon). The buses arrive between 5:09 AM and 7:53 AM with 25- to 30-minute headways; the same buses leave between 3:37 PM and 6:10 PM with 15- to 45-minute headways.

Bus Route 122 is an express bus route that operates on US 101, Lawrence Expressway, Caribbean Drive, Java Drive, and Mathilda Avenue; it connects south San Jose (Santa Teresa LRT Station) to the Lockheed Martin Transit Center. One Route 122 run occurs during each weekday peak period (to the Project area in the morning and from it in the afternoon). The bus arrives at 6:45 AM and leaves at 4:48 PM.

Bus Route 321 is a limited stop bus route that operates on the Lawrence Expressway, Caribbean Drive, Java Drive, and Mathilda Avenue; it connects Milpitas (Great Mall Transit Center) to the Lockheed Martin Transit Center. One Route 321 run occurs during each weekday peak period (away from the Project area in the morning and the Project area in the afternoon). The bus arrives at 8:44 AM and leaves at 5:50 PM.

Bus Route 328 is a limited stop bus route that operates on the Lawrence Expressway, Caribbean Drive, Java Drive, and Mathilda Avenue; it connects south San Jose (near Almaden Expressway) to the Lockheed Martin Transit Center. One Route 321 run occurs during each weekday peak period (away from the Project area in the morning and to it in the afternoon). The bus arrives at 7:07 AM and leaves at 4:50 PM.

Additionally, *Bus Route 104* passes the Project site on US 101 and SR 237; it connects Palo Alto, Mountain View, Milpitas, and San Jose.

Caltrain and ACE Shuttles

Caltrain provides intercity passenger rail service between San Francisco and San Jose. Four *Mary/Moffett Area Caltrain Shuttle* runs connect the Mountain View Caltrain Station with office buildings in the Mary Avenue and Moffett Park areas. During weekday AM and PM commute periods, the Caltrain shuttle operates every 50 to 60 minutes on Mathilda Avenue with a stop near Ahwanee Avenue; there is another stop on Hamlin Court off Ross Drive. The Mountain View station is a designated express train station for Caltrain. Bus service between the Sunnyvale Caltrain Station and the Moffett Park area is provided by VTA Route 54. Additional private shuttles to the Moffett Park area from the Sunnyvale Caltrain Station are operated by local employers. These services are generally limited to the specific employer(s).

The *Altamont Commuter Express* provides passenger rail service between Stockton and San Jose. The *Altamont Commuter Express Red Line Shuttle (Route 826)* provides free shuttle service between buildings in the Moffett Park and the ACE Great America Station in Santa Clara. This shuttle operates on Mathilda Avenue north of the study area. Shuttle stops are provided at the Lockheed Martin/Moffett Park Transit Center. Three shuttle runs operate during each commute period with 60-minute headways.

Local Shuttles

There are a number of local shuttles specific to Moffett Park Area that provide service within Moffett Park and to surrounding neighborhoods and major transit facilities. The Moffett Park Business & Transportation Association provides information on the shuttle programs to the tenant in Moffett Park.

EXISTING TRANSPORTATION DEMAND MANAGEMENT PROGRAMS

The MPSP requires all new projects in the Moffett Park area of Sunnyvale to have transportation demand management (TDM) programs that reduce daily trips by a minimum of 20 percent and peak hour vehicles trips by at least 30 percent from ITE Trip generation estimates. Based on the MPSP, TDM programs need to provide detailed descriptions of the employed TDM strategies and should address penalties for noncompliance. TDM programs include an annual review of employee commuting patterns and need to be submitted to City staff for review.

To meet the MPSP TDM requirements, the Project applicant has developed a TDM plan for the Project site, which has been included in the TIA, and is discussed in more detail in Impact 4.6-2, below.

EXISTING INTERSECTIONS LEVELS OF SERVICE (LOS)

Signalized Intersections

The method described in Chapter 16 of the 2000 *Highway Capacity Manual* (HCM) (Special Report 209, Transportation Research Board) was used to prepare the level of service (LOS) calculations for the study intersections. This LOS method, which is approved by the City of Sunnyvale and VTA, analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using TRAFFIX analysis software and is correlated to a LOS designation as shown in Table 4.6-1.

TABLE 4.6-1
SIGNALIZED INTERSECTION LOS DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Average Control Delay per Vehicle
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B+	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 12.0
B		12.1 to 18.0
B-		18.1 to 20.0
C+	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 23.0
C		23.1 to 32.0
C-		32.1 to 35.0

TABLE 4.6-1, CONTINUED

Level of Service	Description	Average Control Delay per Vehicle
D+	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0
D		39.1 to 51.0
D-		51.1 to 55.0
E+	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 60.0
E		60.1 to 75.0
E-		75.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

The City of Sunnyvale's minimum threshold for acceptable signalized intersection operations is LOS D, except for regionally significant roadways. Regionally significant roadways are generally CMP roadways and relevant to this project include the corridors along Mathilda Avenue, Lawrence Expressway, Caribbean Drive, and El Camino Real The threshold for regionally significant roadway intersections, consistent with Santa Clara County CMP intersections is LOS E. Designated CMP intersections within the study area include, Mathilda Avenue/Java Drive (#3), Mathilda Avenue/Maude Avenue (#12), Mathilda Avenue/El Camino Real (#19), Lawrence Expressway/Tasman Drive (#37), and Lawrence Expressway/Arques Avenue (#42). Similarly, LOS D is the minimum threshold for acceptable signalized intersection operations for City of Mountain View intersections.

Unsignalized Intersections

The operations of the unsignalized intersections were evaluated using the method contained in Chapter 17 of the *2000 HCM*. LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street-controlled intersections, the average control delay is calculated for each stopped movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. Table 4.6-2 summarizes the relationship between delay and LOS for unsignalized intersections. The City of Sunnyvale does not have an officially adopted significance criteria for unsignalized intersections; though based on previous studies, a threshold of LOS E and Manual on Uniform Traffic Control Devices (MUTCD) signal warrant analysis are used to evaluate impacts at unsignalized intersections.

TABLE 4.6-2
UNSIGNALIZED INTERSECTION LOS DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Average Control Delay per Vehicle
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Very long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

Existing intersection lane configurations, signal timings, and peak-hour turning movement volumes were used to calculate the levels of service for the key intersections during each peak hour. The existing peak hour volumes and lane configurations are illustrated in Figures 4.6-6 through 4.6-8 at the end of this section. The results of the LOS analysis using the TRAFFIX software program for existing conditions are presented in Table 4.6-3. The results of the LOS calculations indicate that all study intersections operate at acceptable service levels (LOS D or better for City intersections and LOS E or better for regionally significant and CMP intersections) during the AM and PM peak hours.

TABLE 4.6-3
EXISTING INTERSECTION LEVELS OF SERVICE

Intersection		Peak Hour[1]	Intersection Control	Delay[2]	LOS[3]
1	Northbound US 101 Ramps/Moffett Park Drive	AM PM	Signal	1.9 7.5	A A
2	Lockheed Martin Way/Moffett Park Drive	AM PM	Signal	5.6 7.8	A A
3	Mathilda Avenue/Java Drive	AM PM	Signal	18.8 21.0	B- C+
4	Mathilda Avenue/5th Avenue	AM PM	Signal	11.0 21.4	B+ C+
5	Mathilda Avenue/Innovations Way	AM PM	Signal	7.9 13.5	A B
6	Mathilda Avenue/Moffett Park Drive	AM PM	Signal	18.1 19.1	B- B-
7	Mathilda Ave/Westbound SR 237 Ramps	AM PM	Signal	12.1 15.4	B B
8	Mathilda Ave/Eastbound SR 237 Ramps	AM PM	Signal	12.9 11.8	B B+

TABLE 4.6-3, CONTINUED

Intersection		Peak Hour[1]	Intersection Control	Delay[2]	LOS[3]
9	Mathilda Avenue/Ross Drive	AM PM	Signal	12.9 13.0	B B
10	Mathilda Avenue/Ahwanee Avenue	AM PM	Signal	17.2 20.3	B C+
11	Mathilda Avenue/San Aleso Avenue	AM PM	Signal	8.6 8.2	A A
12	Mathilda Avenue/Maude Avenue (CMP intersection)	AM PM	Signal	24.2 25.8	C C
13	Mathilda Avenue/Indio Way	AM PM	Signal	11.1 13.5	B+ B
14	Mathilda Avenue/California Ave	AM PM	Signal	16.2 18.7	B B-
15	Mathilda Avenue/Washington Avenue	AM PM	Signal	18.5 18.1	B- B-
16	Mathilda Avenue/West McKinley Avenue	AM PM	Signal	13.8 16.4	B B
17	Mathilda Avenue/Iowa Avenue	AM PM	Signal	12.9 16.1	B B
18	Mathilda Avenue/Olive Drive	AM PM	Signal	10.3 11.8	B+ B+
19	Mathilda Avenue/El Camino Real	AM PM	Signal	28.5 26.3	C C
20	Bordeaux Drive/ Java Drive	AM PM	Signal	16.3 19.0	B B-
21	Bordeaux Drive/New Roadway (future)	AM PM	SSSC	N/A N/A	N/A N/A
22	Bordeaux Drive /Moffett Park Drive	AM PM	SSSC	22.1 14.1	C B
23	Borregas Avenue/Caribbean Drive	AM PM	Signal	13.3 13.8	B B
24	Borregas Avenue/Java Drive	AM PM	Signal	16.8 17.4	B B
25	Borregas Avenue/Moffett Park Drive	AM PM	SSSC	20.2 11.7	C B
26	Crossman Avenue/Caribbean Drive	AM PM	Signal	6.6 18.0	A B-
27	Crossman Avenue/Java Drive	AM PM	Signal	14.7 22.1	B C+

TABLE 4.6-3, CONTINUED

Intersection		Peak Hour[1]	Intersection Control	Delay[2]	LOS[3]
28	Crossman Avenue/Moffett Park Drive	AM PM	Signal	14.8 17.0	B B
29	Fair Oaks Avenue/Fair Oaks Way	AM PM	Signal	17.8 24.1	B C
30	Fair Oaks Avenue/Tasman Drive	AM PM	Signal	18.3 21.3	B- C+
31	Fair Oaks Avenue/East Weddell Drive	AM PM	Signal	15.3 21.0	B C+
32	Fair Oaks Ave/Northbound US 101 Ramps	AM PM	Signal	18.0 22.9	B- C+
33	Fair Oaks Avenue/Wolfe Road	AM PM	Signal	13.6 11.9	B B+
34	Twin Creeks Entrance/Caribbean Drive	AM PM	Signal	8.8 10.1	A B+
35	Moffett Park Drive/Caribbean Drive	AM PM	Signal	16.1 16.4	B B
36	Lawrence Expressway/Persian Drive-Elko Drive	AM PM	Signal	20.8 19.3	C+ B-
37	Lawrence Expressway/Tasman Drive	AM PM	Signal	49.1 39.3	D E+
38	Lawrence Expressway/Lakehaven Drive	AM PM	Signal	24.6 39.3	C D
39	Lawrence Expressway/NB US 101 Ramps	AM PM	Signal	16.2 17.4	B B
40	Lawrence Expressway/SB US 101 Ramps	AM PM	Signal	13.1 21.3	B C+
41	Lawrence Expressway/Duane Avenue/Oakmead Parkway	AM PM	Signal	38.1 44.4	D+ D
42	Lawrence Expressway/Arques Avenue	AM PM	Signal	27.9 44.6	C D

Notes:

[1] AM = morning peak hour, PM = afternoon peak hour.

[2] Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County Conditions per VTA guidelines. Total control delay for the worst movement is presented for side-street stop-controlled intersections

[3] LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the methodology described in the *2000 HCM*.

* CMP intersection with LOS E threshold.

** Regionally significant intersection with LOS E threshold.

Source: Fehr & Peers, April 2013.

EXISTING FREEWAY SEGMENT LEVELS OF SERVICE

Freeway segments are evaluated using VTA's analysis procedure, which is based on the density of the traffic flow using methods described in the *2000 HCM*. Density is expressed in passenger cars per mile per lane. The Congestion Management Program range of densities for freeway segment level of service is shown in Table 4.6-4. The LOS standard for the freeway segments is LOS E.

TABLE 4.6-4
FREEWAY SEGMENT LOS DEFINITIONS

Level of Service	Density (passenger cars per mile per lane)
A	≤ 11.0
B	11.1 to 18.0
C	18.1 to 26.0
D	26.1 to 46.0
E	46.1 to 58.0
F	> 58.0

Sources: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

According to VTA's *Transportation Impact Analysis Guidelines* (VTA, 2009) a freeway segment analysis should be included if the project meets one of the following requirements:

- The proposed development project is expected to add traffic equal to at least one percent of a freeway segment's capacity;
- The proposed development project is adjacent to one of the freeway segment's access or egress points; and/or
- Based on engineering judgment, Lead Agency staff determines that the freeway segment should be included in the analysis.

For mixed-flow lanes, freeway segment capacities are defined as 2,200 vehicles per hour per lane (vphpl) for four-lane freeway segments and 2,300 vphpl for six-lane freeway segments. HOV lane capacities are defined between 1,800 to 1,900 vphpl. Table 4.6-5 contains the existing freeway segment levels of service for the mixed-flow and HOV lanes based on the segment densities reported in the VTA's *2011 CMP Monitoring and Conformance Report,* which is the most recent report available as of April 2013.

TABLE 4.6-5
EXISTING FREEWAY SEGMENT LOS

Freeway Segment	Direction	Peak Hour[1]	Lanes		Density[2]		LOS[3]	
			Mixed	HOV	Mixed	HOV	Mixed	HOV
US 101, Ellis Street to SR 237	NB	AM	3	1	**101**	**65**	**F**	**F**
		PM	3	1	**81**	22	**F**	C
	SB	AM	3	1	37	20	D	C
		PM	3	1	39	19	D	C
US 101, SR 237 to Mathilda Avenue	NB	AM	3	1	**71**	40	**F**	D
		PM	3	1	**34**	22	**F**	C
	SB	AM	3	1	26	27	C	D
		PM	3	1	25	30	C	D
US 101, Mathilda Avenue to Fair Oaks Avenue	NB	AM	3	1	74	30	**F**	D
		PM	3	1	26	10	C	A
	SB	AM	3	1	27	20	D	C
		PM	3	1	32	14	D	B
US 101, Fair Oaks Avenue to Lawrence Expressway	NB	AM	3	1	61	32	**F**	D
		PM	3	1	28	13	D	B
	SB	AM	3	1	30	16	D	B
		PM	3	1	38	17	D	B
SR 237, Maude Avenue to US 101	EB	AM	2	0	60	0	**F**	N/A
		PM	2	0	25	0	C	N/A
	WB	AM	2	0	31	0	D	N/A
		PM	2	0	60	0	**F**	N/A
SR 237, US 101 to Mathilda Avenue	EB	AM	2	0	74	0	**F**	N/A
		PM	2	0	32	0	D	N/A
	WB	AM	2	0	57	0	E	N/A
		PM	2	0	42	0	D	N/A
SR 237, Mathilda Avenue to Fair Oaks Avenue	EB	AM	2	1	58	27	E	D
		PM	2	1	47	18	E	B
	WB	AM	3	0	**86**	0	**F**	N/A
		PM	3	0	**100**	0	**F**	N/A
SR 237, Fair Oaks Avenue to Lawrence Expressway	EB	AM	2	1	37	17	D	B
		PM	2	1	**87**	23	**F**	C
	WB	AM	2	1	58	50	E	E
		PM	2	1	**75**	38	**F**	D

Notes:
[1] AM = morning peak hour, PM = afternoon peak hour.
[2] Measured in passenger cars per mile per lane.
[3] LOS = level of service.
N/A = Not applicable. Freeway Segment does not have HOV lanes.
Bold font indicates unacceptable operations based on VTA's LOS E Standard.
Source: *2011 Monitoring and Conformance Report*, VTA, June 2012.

The following mixed-flow freeway segments exceed VTA's LOS E standard during the specified peak hour:

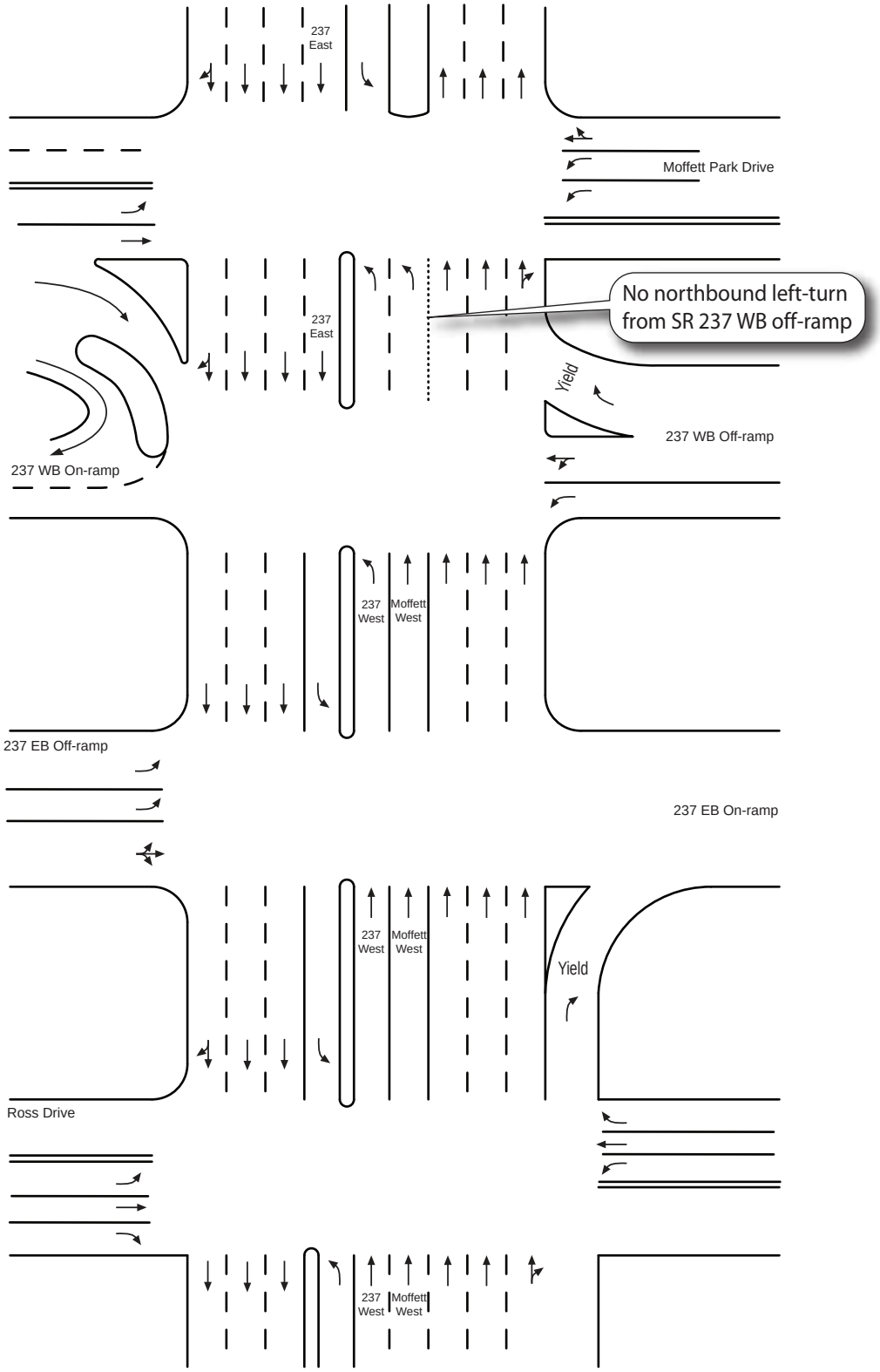
- US 101, Northbound, Ellis Street to SR 237 (AM & PM peak hours)
- US 101, Northbound, SR 237 to Mathilda Avenue (AM & PM peak hours)
- US 101, Northbound, Mathilda Avenue to Fair Oaks Avenue (AM peak hour)
- US 101, Northbound Fair Oaks Avenue to Lawrence Expressway (AM peak hour)
- SR 237, Eastbound, US 101 to Maude Avenue (AM peak hour)
- SR 237, Westbound, US 101 to Maude Avenue (PM peak hour)
- SR 237, Eastbound, Mathilda Avenue to US 101 (AM peak hour)
- SR 237, Westbound, Mathilda Avenue to US 101 (AM peak hour)
- SR 237, Westbound, Fair Oaks Avenue to Mathilda Avenue (AM & PM peak hours)
- SR 237, Eastbound Fair Oaks Avenue to Lawrence Expressway (PM peak hour)
- SR 237, Westbound Fair Oaks Avenue to Lawrence Expressway (AM & PM peak hours)

All other freeway segments operate at acceptable LOS E or better during both peak periods.

FIELD OBSERVATIONS OF MATHILDA AVENUE INTERSECTIONS

Field observations of the study intersections were conducted during the morning and evening peak hours in March 2013. In most cases, the intersections were observed to operate at the calculated levels of service for each peak hour. However, in some locations, there were differences between the observed and calculated operations. During both AM and PM peak commute periods, operations at the intersections of Mathilda Avenue/Moffett Park Drive, Mathilda Avenue/SR 237 westbound ramps, and Mathilda Avenue/SR 237 eastbound ramps experienced high traffic volumes that caused long queues and congestion.

Mathilda Avenue, from Moffett Park Drive to Ross Drive – There are four closely spaced, signalized intersections within a distance of 750 feet in this section of Mathilda Avenue. These intersections are illustrated in Figure 4.6-4. These intersections carry traffic using three major regional roadways: SR 237, US 101, and Mathilda Avenue. The combination of heavy traffic volumes and close intersection spacing make lane changes difficult. The weaving maneuvers for each intersection are described below.



Source: Fehr & Peers, July 2013.

FIGURE 4.6-4

Matilda Avenue Roadway Diagram

7/19/13 JN 133847-19136 MAS

In addition, several through lanes on Mathilda Avenue ultimately end in turn lanes at downstream intersections (this condition is commonly referred to as a trap lane). As a result of the existing roadway configuration, a large number of weaving maneuvers occur and vehicles spill back to adjacent intersections resulting in travel delays. The TRAFFIX level of service program cannot fully account for these complex maneuvers; therefore, other factors and analysis methods were considered when interpreting the LOS results.

Mathilda Avenue/Moffett Park Drive – In the AM peak hour at the Mathilda Avenue/Moffett Park Drive intersection, the heaviest movements were the northbound through and left-turn movements. Due to the short storage length (90 feet) between Moffett Park Drive and the westbound SR 237 ramps, northbound traffic frequently spill backed into the Mathilda Avenue/SR 237 westbound ramps intersection.

During the PM peak commute period, southbound Mathilda through traffic does not efficiently utilize the available green time due to queue spill back from the downstream intersection at Mathilda Avenue/SR 237 Eastbound ramp intersection. This frequently led southbound through traffic to block the intersection, which in turn hinders westbound traffic from making left turns. It was observed that the westbound left-turn movement had a large queue and only about half of the queue was able to clear during each green phase (cycle). This standing queue resulted in two to three cars per cycle that entered the intersection under the red at the end of each phase serving westbound Moffett Park Drive.

Mathilda Avenue/SR 237 Westbound Ramps – Westbound SR 237 off-ramp traffic cannot access westbound Moffett Park Drive; vertical delineators prohibit the right-turn movement into those lanes. Vehicles would have to cross three lanes of through traffic on Mathilda Avenue to access the northbound left-turn lane. These maneuvers would have to be accomplished in less than 100 feet.

Mathilda Avenue/SR 237 Eastbound Ramps – During the AM peak period, traffic was heavy at the intersection of Mathilda Avenue/SR 237 eastbound ramps; however, there was little congestion and no illegal movements observed. During the PM peak period, the southbound through and left-turn lanes have limited storage capacity, which causes vehicles to spill back into the upstream intersection at Moffett Park Drive.

Mathilda Avenue/Ross Drive - During the AM peak period, traffic is heaviest in the northbound direction (through movements). Specifically, lane utilization is the heaviest in the outer through lane, with vehicles lining up to access the SR 237 eastbound on-ramp at the next intersection. Queues occasionally backed up near the northbound off-ramp, but cleared within two minutes. The queues did affect freeway or ramp operations. In the PM peak hour, no major queues or delays were observed. Southbound traffic is held at the signal for the SR 237 eastbound off-ramp and approaches the Mathilda Avenue/Ross Drive intersection in smaller platoons (groups), which minimizes potential delay and queuing problems.

4.6.2 REGULATORY AND PLANNING FRAMEWORK

The development and regulation of the transportation network in the vicinity of the Project area primarily involves county and local jurisdictions. Applicable local laws and regulations related to transportation and traffic issues are discussed below.

COUNTY OF SANTA CLARA

Santa Clara County General Plan. The Santa Clara County General Plan Transportation Chapter provides information about the transportation needs of the County (County of Santa Clara, 1994a, 1994b). The Plan also includes Level of Service (LOS) standards for the County. The General Plan policies relevant to transportation and traffic relative to the proposed Project are listed below:

C-TR 5 Enhance the effectiveness of transportation infrastructure investment through coordination and consistency of local land use plans, specific plans, and redevelopment plans with transit planning.

C-TR 7 Emphasize land use, density patterns, mixed use, and compact development that support travel alternatives, especially along planned transportation and transit corridors and urban activity centers.

C-TR 8 Develop transit-oriented urban design and site development standards to facilitate access to transit, bike, and pedestrian facilities.

R-TR 11 New development which would significantly impact private or public roads should be allowed only when safety hazards and roadway deterioration will be mitigated to a less than significant level.

R-TR 14 Environmental impacts of roadway construction and expansion should be mitigated to a less than significant level.

Congestion Management Program (CMP). The Santa Clara County Congestion Management Program (CMP) designates the roadway system for use in annual monitoring of level of service standards, identifies regionally significant roadways and intersections to be evaluated in land use impacts analyses, and identifies the potential candidates for inclusion in the Regional Transportation Plan capital improvement program. The CMP principal arterial system generally includes state highways, six-lane roads and/or non-residential arterials with average daily traffic (ADT) of 30,000 vehicles per day or more.

In Sunnyvale, the CMP roadway system includes US-101, Route 85, Route 237, Central Expressway, Lawrence Expressway, El Camino Real, Mathilda Avenue, Caribbean Drive and Sunnyvale-Saratoga Road.

VALLEY TRANSPORTATION AUTHORITY (VTA)

Bus service in the Project area and throughout Santa Clara County is provided by the Santa Clara Valley Transportation Authority (VTA). VTA has jurisdiction over public transit in Santa Clara County, and is responsible for developing public transit projects to meet the growing transportation needs of the County.

CITY OF SUNNYVALE

City of Sunnyvale General Plan. The Sunnyvale General Plan (General Plan), as consolidated in 2011 was adopted by the City Council on July 26, 2011. The General Plan is a fundamental tool in guiding the City through change and growth. It addresses the physical development of the City and, when used together with a larger body of City Council policies, provides direction for decision-making on City services and resources. It is both a long-range and a strategic planning document, containing long-term goals and policies for the next 10-20 years and strategic actions for the next five to ten years. The General Plan contains the following chapters: Introduction, Community Vision, Land Use and Transportation, Community Character, Housing, Safety and Noise, and Environmental Management. The General Plan was assembled from 22 separate General Plan elements and sub-elements that were adopted at different times. This consolidated and streamlined General Plan contains all necessary goal and policy language to address the required elements in a concise and easy-to-use fashion. Goals reference the year of the original adoption as well as the original goal or policy number.

Chapter 3, Land Use and Transportation, guides the long-range planning and management of transportation facilities and improvements to those facilities. Goals pertinent to the proposed Project are listed below:

Goal LT-1 Coordinated Regional Planning;

Goal LT-4 Quality Neighborhoods and Districts; and

Goal LT-5 Effective, Safe, Pleasant and Convenient Transportation.

4.6.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

As defined in Appendix G of the CEQA Guidelines, project impacts to traffic would be considered significant if the project was determined to:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

- Conflict with an applicable congestion management program, including, but not limited to LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities; or
- Conflict with adopted policies, plans, or programs regarding parking.

METHODOLOGY

This section evaluates the Project's effects related to traffic and transportation. The roadway system was evaluated under Project scenarios for Existing, Background, and Cumulative Conditions. The amount of traffic anticipated to be added to the surrounding roadway system by the proposed Project was estimated based on data published in Institute of Transportation Engineers' (ITE) *Trip Generation* 9th Edition (2012). Trip generation estimates for the proposed Project was developed by incorporating the site size both with the existing uses and with the proposed redevelopment into the trip generation equations for "Research and Development Center" (ITE Land Use 760), "Hotel" (ITE Land Use 310) and "Community College" (ITE Land Use 540) for each respective component of the Project.

Peak hour trip reductions of 30 percent are required as part of the Transportation Demand Management (TDM) program for the MPSP; however, the VTA guidelines only allow for a maximum 9.5 percent reduction on vehicle trips for projects near a light rail station that have an effective TDM program. A 9.5 percent reduction was applied to the office portion of the Project trip estimates to determine the number of net new trips generated by the Project. Due to the discrepancies between the MPSP and VTA TDM standards, a sensitivity analysis was conducted at each location that was identified as being potentially impacted by Project traffic. All identified potential impacts were reevaluated assuming the MPSP TDM trip reduction of 30% during the peak hours to identify any change to the impact under the MPSP standards.

MEASURES OF EFFECTIVENESS FOR THE PERFORMANCE OF THE CIRCULATION SYSTEM

Impact 4.6-1: The proposed project could conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into

account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. (Less Than Significant With Mitigation)

City of Sunnyvale Intersection Impact Criteria

Signalized Intersections

The LOS standard for City of Sunnyvale intersections is LOS D except for City of Sunnyvale intersections that are designated regionally significant. Regionally significant roadways are generally CMP roadways and relevant to this TIA include the corridors along Mathilda Avenue, Lawrence Expressway, Caribbean Drive, and El Camino Real. The threshold for regionally significant roadway intersections, consistent with Santa Clara County CMP intersections, is LOS E. Traffic impacts at City of Sunnyvale would occur when the addition of traffic associated with implementation of the Project causes:

- Intersection (except those on designated regionally significant roads) operations to deteriorate from an acceptable level (LOS D or better) under the Existing Conditions to an unacceptable level (LOS E or LOS F); or,
- Operations for regionally significant designated intersections to deteriorate from an acceptable level (LOS E or better) under the Existing Conditions to an unacceptable level (LOS F); or,
- Exacerbation of unacceptable operations by increasing the average critical delay by more than 4 seconds and increasing the critical volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS E or F (LOS F for regionally significant roads).

Unsignalized Intersections

LOS analysis at unsignalized intersections is generally used to determine the need for modification in type of intersection control (i.e. all-way stop or signalization). As part of this evaluation, traffic volumes, delay, and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

The City of Sunnyvale does not have an officially adopted significance criteria for unsignalized intersections. Based on previous studies in the City of Sunnyvale, significant impacts are defined to occur when the addition of project traffic causes the average intersection delay for all-way stop-controlled intersections, or the worst movement/approach for side-street stop-controlled intersections to degrade to LOS F and the intersection satisfies any traffic signal warrant from the MUTCD.

Existing Project Traffic Estimates

The amount of traffic added to the roadway system by the proposed Project is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of traffic added to the roadway network. The second step estimates the direction of travel to and from the Project site. The new trips are assigned to specific street segments and intersection turning movements during the third step. The project trip distribution is shown in Figure 4.6-5. The results of the process for the proposed Project are described in the following sections.

Trip Generation

The amount of traffic anticipated to be added to the surrounding roadway system by the proposed Project was estimated based data published in Institute of Transportation Engineers' (ITE) *Trip Generation* 9th Edition (2012). The results presented in Table 4.6-6 show that the proposed Project is estimated to generate 5,820 net new daily trips, 852 net new AM peak-hour trips (705 inbound trips and 148 outbound trips), and 1,390 net new PM peak-hour trips (179 inbound trips and 1,211 outbound trips). It should be noted that the trip generation numbers include the trips generated by a proposed expansion of the existing Sheraton Hotel located adjacent to the property at the intersection of Mathilda Avenue and Moffett Park Drive. The hotel expansion is not a part of the proposed Project, however; the City has received a preliminary development application for the hotel. As a conservative approach, the City has included traffic trips from the hotel as part of the Project traffic analysis because hotel traffic would use the same roadways and intersections in the vicinity as the proposed Project.

Travel Demand Management

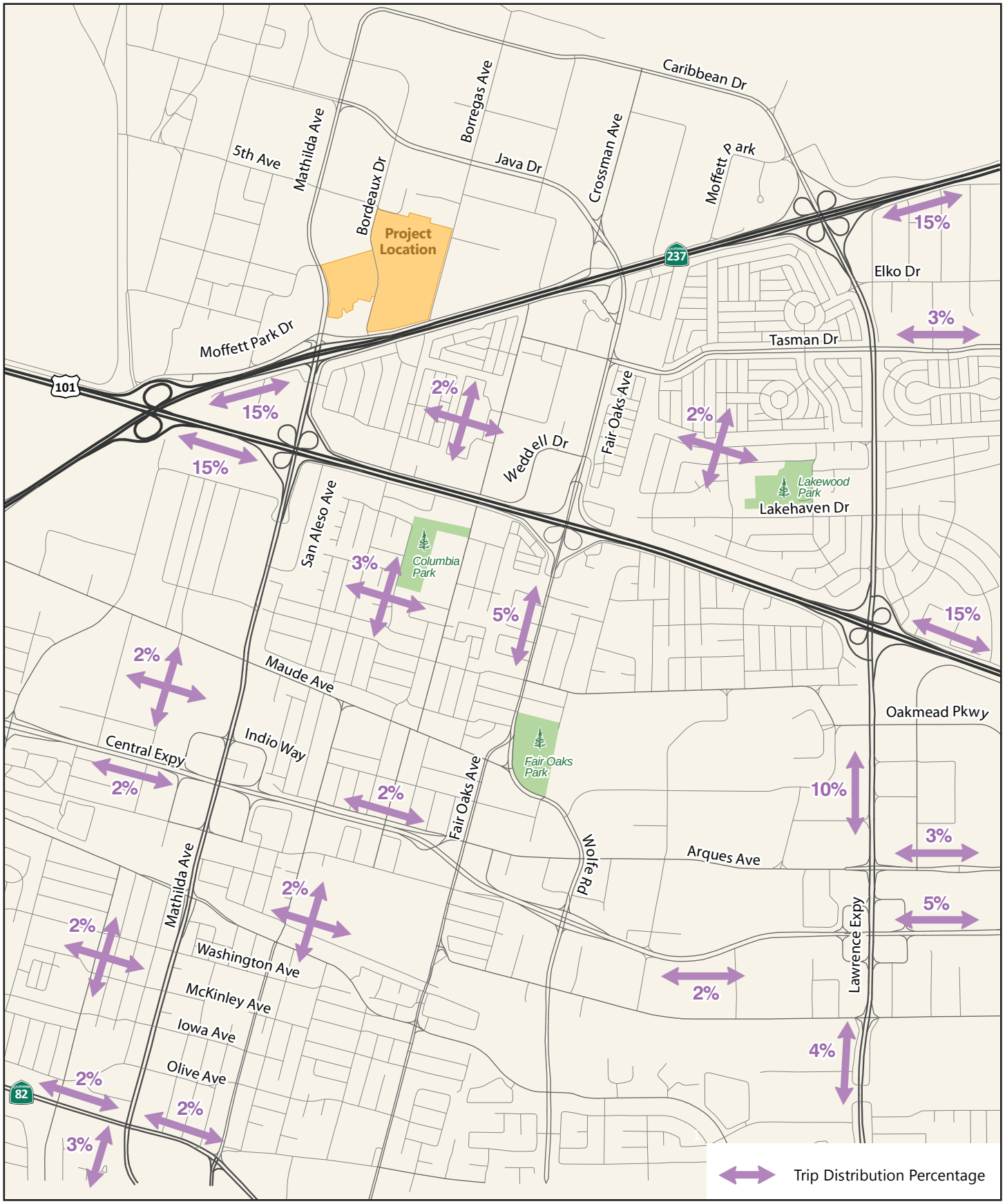
As discussed previously in this section, the MPSP requires all new projects in the Moffett Park area of Sunnyvale to have transportation demand management (TDM) programs that reduce daily trips by a minimum of 20 percent and peak hour vehicles trips by at least 30 percent from ITE Trip generation estimates. To meet the project TDM requirements, the Project applicant has developed a TDM plan for the Project site (included in the TIA). Below is a brief summary of the proposed measures included in the plan:

TDM Plan Elements - Program and Service Measures

Financial Incentives - Tenants provide *VTA Eco Passes*, which give holders unlimited rides on VTA light rail, bus, and express bus services, and *Guaranteed Ride Home services*, for their employees.

Work Schedule Options - TDM Coordinators assist employees with telecommuting and compressed/alternative work schedule activities.

Carpool Matching - TDM Coordinators assist employees with carpool matching.



Source: Fehr & Peers, July 2013.

FIGURE 4.6-5

Trip Distribution

RBF A Baker Company

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MOFFETT PLACE EIR

TABLE 4.6-6
TRIP GENERATION

Land Use	ITE Code[1]	Size/ Units[2]	Daily		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate[3]	In	Out	Total	Rate[3]	In	Out	Total
PROJECT SITE EXISTING LAND USES												
R&D	760	537.1141ksf	7.45	4,003	1.05	469	96	565	1.47	118	669	787
Cogswell College	540	61.000 ksf	27.49	1,677	2.99	135	47	182	2.54	90	65	155
9.5% TDM Program Reduction[4]				(539)		(57)	(14)	(71)		(20)	(70)	(90)
Net Existing R&D/College Trips				*5,141*		*547*	*129*	*676*		*188*	*664*	*852*
Hotel	310	173 Rooms	6.79	1,175	0.46	49	32	81	0.59	54	48	102
PROJECT SITE EXISTING VEHICLE TRIPS (A)				***6,316***		***596***	***161***	***757***		***242***	***712***	***954***
PROJECT SITE PROPOSED LAND USES												
Moffett Place Office Development	760	1,799.554 ksf	5.99	10,787	0.89	1,326	271	1,597	1.33	359	2,031	2,390
9.5% TDM Program Reduction[4]				(1,025)		(126)	(26)	(152)		(34)	(193)	(227)
Net Proposed R&D Trips				*9,762*		*1,200*	*245*	*1,445*		*325*	*1,838*	*2,163*
Hotel Development	310	307 Rooms	7.73	2,374	0.53	100	64	164	0.59	96	85	181
PROJECT SITE NEW FUTURE MOFFETT PLACE VEHICLE TRIPS (B)				***12,136***		***1,300***	***309***	***1,609***		***421***	***1,923***	***2,344***
TOTAL NET NEW MOFFETT PLACE VEHICLE TRIPS (C = B – A)				**5,820**		**704**	**148**	**852**		**179**	**1,211**	**1,390**

Notes:

1. ITE Code 760 – R&D Office Building, ITE Code 760 – Hotel.

2. ksf = 1,000 square feet

3. Rate per unit (ksf or hotel room)

4. Based on allowable TDM and employment near light rail reductions per VTA guidelines. Reduction was not applied to Hotel uses.

Sources: *Trip Generation Manual* (9th Edition), ITE, 2012; *Transportation Impact Analysis Guidelines*, VTA Congestion Management Program, March 2004.

Supplementary TDM Plan Elements - Planning and Design Measures

Transit Service - The Project provides direct access to VTA bus and LRT service on Mathilda Avenue via public pathways and private sidewalks, and improved sidewalk access to VTA bus and LRT service on Java Drive via public sidewalks on Borregas Avenue.

Bike and Pedestrian - The Project includes the following elements to enhance bike and pedestrian access:

- Public sidewalks along the proposed new street connection between Bordeaux Drive and Mathilda Avenue;
- Formal pedestrian pathways connecting all buildings and parking facilities; designated passenger loading and unloading zones at all main building entries;
- Public trail improvements along the Water District drainage creek within the Project boundary;
- Two public pathways through the site between Mathilda Avenue and Borregas Avenue.

Bicycle parking facilities - Class I (secure enclosures) and Class II (lockable racks), located at key locations within the Project site to enhance usefulness.

Preferential parking for carpool and vanpool users – some of the more desirable parking spaces (those closest to buildings access points) within the Project site will be reserved for carpool and vanpool users.

The Project amenities facility- includes a 50,000 sf building with fitness center (including changing facilities and showers) and cafe, and extensive outdoor features including a pool and basketball courts.

Monitoring, Reporting, and Assurance of Success

The Project site will develop and maintain a monitoring program that will review of employee commuting patterns and report penalties for non-compliance based on the TDM requirements defined in the MPSP. This report will be submitted to City staff for review on an annual basis.

Existing Plus Project Intersection Levels of Service (LOS)

Intersection levels of service (LOS) were calculated with the new traffic added by the proposed Project to evaluate the operating conditions of the intersections and identify potential impacts to the roadway system. The results of the intersection level of service calculations for Existing Plus Project Conditions are presented in Table 4.6-7. The results for Existing Conditions are included for comparison purposes,

along with the projected increases in critical delay and critical volume-to-capacity (V/C) ratios. Critical delay represents the delay associated with the critical movements of the intersection, or the movements that require the most "green time" and have the greatest effect on overall intersection operations. The changes in critical delay and critical V/C ratio between Existing and Existing Plus Project Conditions are used to identify significant impacts. The peak hour traffic volumes and land configurations under the Existing Plus Project Conditions are illustrated in Figures 4.6-9 through 4.6-11 at the end of this section.

The results of the LOS calculations indicate that all study intersections operate at acceptable service levels (LOS D or better for signalized City intersections and LOS E or better for regionally significant, CMP intersections, and unsignalized City intersections) during the AM and PM peak hours with the exception of the unsignalized intersections noted below:

Signalized Intersections

All signalized key study intersections operate at an acceptable LOS under Existing plus Project Conditions.

Unsignalized Intersections

Bordeaux Drive/Moffett Park Drive (#22): during the AM peak hour, the addition of Project traffic degrades intersection operation from acceptable LOS C to unacceptable LOS F.

Under Existing plus Project Conditions the Bordeaux Drive/Moffett Park Drive intersection is projected to operate at unacceptable LOS F during the AM peak hour; however, is not projected to meet the MUTCD peak hour signal warrant volume threshold. In the PM peak hour, the intersection is projected to operate at acceptable LOS E and is projected to meet the MUTCD peak hour signal warrant volume thresholds. While the intersection operates at an unacceptable LOS during the AM peak hour and meets the peak hour volume signal warrant during the PM peak hour, the intersection does not meet the both impact thresholds (LOS F and peak hour signal warrant) during either the AM and PM peak hours. Therefore, based on the City of Sunnyvale's intersection threshold, the Bordeaux Drive/Moffett Park Drive intersection would have a less-than-significant impact.

Borregas Avenue/Moffett Park Drive (#25): during the AM peak hour the addition of project traffic degrades intersection operation from LOS C to LOS F.

Under Existing plus Project Conditions the Borregas Avenue/Moffett Park Drive intersection is projected to operate at unacceptable LOS F during the AM peak hour, while the intersection is not projected to meet the MUTCD peak hour signal warrant volume threshold. Therefore, based on the City of Sunnyvale's intersection threshold the Borregas Avenue/Moffett Park Drive intersection would have a less-than-significant impact at this location.

TABLE 4.6-7
EXISTING AND EXISTING PLUS PROJECT INTERSECTION LOS

Intersection		Peak Hour[1]	Inter-section Control	Existing Conditions		Existing plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
1	Northbound US 101 Ramps/Moffett Park Drive	AM	Signal	1.9	A	2.1	A	0.000	0.0	N/A
		PM		7.5	A	9.2	A	0.065	1.8	N/A
2	Lockheed Martin Way/Moffett Park Drive**	AM	Signal	5.6	A	5.6	A	0.006	-0.1	N/A
		PM		7.8	A	8.4	A	0.032	0.2	N/A
3	Mathilda Avenue/Java Drive**	AM	Signal	17.5	B	17.5	B	0.001	0.0	N/A
		PM		21.0	C+	21.0	C+	0.000	0.0	N/A
4	Mathilda Avenue/5th Avenue**	AM	Signal	10.6	B+	10.6	B+	0.001	0.0	N/A
		PM		28.2	C	28.2	B+	0.001	0	N/A
5	Mathilda Avenue/Innovation Way**	AM	Signal	7.9	A	12.0	B+	0.087	-4.8	N/A
		PM		13.5	B	15.9	B+	0.063	2.6	N/A
6	Mathilda Avenue/Moffett Park Drive**	AM	Signal	18.4	B-	52.3	D-	0.332	96.5	N/A
		PM		19.3	B-	26.4	C	0.125	9.6	N/A
7	Mathilda Ave/Westbound SR 237 Ramps**	AM	Signal	12.0	B	12.9	E+	0.101	0.1	N/A
		PM		15.3	B	15.9	B	0.072	0.7	N/A
8	Mathilda Ave/Eastbound SR 237 Ramps**	AM	Signal	13.2	B	14.2	B	0.097	1.0	N/A
		PM		10.3	B+	12.5	B	-0.090	10.6	N/A
9	Mathilda Avenue/Ross Drive**	AM	Signal	12.9	B	13.0	B	0.042	0.1	N/A
		PM		14.5	B	14.5	B	0.048	0.1	N/A
10	Mathilda Avenue/Ahwanee Avenue**	AM	Signal	17.2	B	17.2	B	0.022	0.0	N/A
		PM		20.4	C+	20.7	C+	0.022	0.6	N/A

TABLE 4.6-7, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Existing Conditions		Existing plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
11	Mathilda Avenue/San Aleso Avenue**	AM	Signal	8.5	A	8.4	A	0.027	0.0	N/A
		PM		8.2	A	8.1	A	0.02	0.1	N/A
12	Mathilda Avenue/Maude Avenue*	AM	Signal	24.2	C	24.4	C	0.028	0.3	N/A
		PM		25.8	C	25.9	C	0.016	0.1	N/A
13	Mathilda Avenue/Indio Way**	AM	Signal	13.8	B	13.8	B	0.019	0.0	N/A
		PM		18.8	B-	19.5	B-	0.018	1.1	N/A
14	Mathilda Avenue/California Ave**	AM	Signal	16.1	B	16.7	B	0.027	1.0	N/A
		PM		18.6	B-	19.5	B-	0.03	1.1	N/A
15	Mathilda Avenue/Washington Avenue**	PM	Signal	18.5	B-	18.8	B-	0.02	0.5	N/A
		AM		18.0	B	18.1	B-	0.014	0.2	N/A
16	Mathilda Avenue/West McKinley Avenue**	PM	Signal	13.7	B	14.1	B	0.017	0.5	N/A
		AM		16.5	B	16.6	B	0.012	0.2	N/A
17	Mathilda Avenue/Iowa Avenue**	PM	Signal	12.9	B	12.8	B	0.007	0.0	N/A
		AM		16.2	B	16.2	B	0.01	0.1	N/A
18	Mathilda Avenue/Olive Drive**	PM	Signal	10.4	B+	10.3	B+	0.01	0.1	N/A
		AM		11.8	B+	11.8	B+	0.009	0.1	N/A
19	Mathilda Avenue/El Camino Real**	PM	Signal	28.8	C	29.4	C	0.011	0.7	N/A
		AM		26.4	C	26.7	C	0.01	0.6	N/A
20	Bordeaux Drive/ Java Drive	PM	Signal	16.4	B	17.1	B	0.006	0.4	N/A
		AM		18.9	B-	19.4	B-	0.032	0.5	N/A
21	Bordeaux Drive/New Roadway (future)	PM	TWSC	N/A	N/A	8.7	A	N/A	N/A	No
		AM		N/A	N/A	8.6	A	N/A	N/A	No

TABLE 4.6-7, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Existing Conditions		Existing plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
22	Bordeaux Drive /Moffett Park Drive	PM	SSSC	**22.1**	**C**	**76.0**	**F**	**N/A**	**N/A**	**No**
		AM		14.1	B	40.8	E	N/A	N/A	Yes
23	Borregas Avenue/Caribbean Drive**	PM	Signal	13.3	B	13.3	B	0.022	-0.2	N/A
		AM		13.8	B	14.3	B	0.025	0.7	N/A
24	Borregas Avenue/Java Drive	PM	Signal	16.8	B	17.4	B	0.033	0.9	N/A
		AM		17.3	B	17.7	B	0.030	0.5	N/A
25	Borregas Avenue/Moffett Park Drive	PM	SSSC	**20.2**	**C**	**51.7**	**F**	**0.169**	**1.7**	**No**
		AM		11.7	B	13.2	B	0.241	2.4	Yes
26	Crossman Avenue/Caribbean Drive**	PM	Signal	6.6	A	6.6	A	0.000	0.2	N/A
		AM		18.0	B-	18.0	B-	0.003	0.0	N/A
27	Crossman Avenue/Java Drive	PM	Signal	13.3	B	13.3	B	0.000	0.0	N/A
		AM		21.4	C+	21.9	C+	0.016	0.6	N/A
28	Crossman Avenue/Moffett Park Drive	PM	Signal	14.8	B	14.8	B	0.024	-0.2	N/A
		AM		17.1	B	17.3	B	0.017	0.5	N/A
29	Fair Oaks Avenue/Fair Oaks Way	PM	Signal	17.9	B	18.0	B-	0.022	0.2	N/A
		AM		24.1	C	24.6	C	0.022	0.6	N/A
30	Fair Oaks Avenue/Tasman Drive	PM	Signal	16.0	B	16.2	B	0.014	0.1	N/A
		AM		18.5	B-	18.6	B-	0.008	0	N/A
31	Fair Oaks Avenue/East Weddell Drive	PM	Signal	16.2	B	16.0	B	0.007	-0.2	N/A
		AM		21.1	C+	21.2	C+	0.007	0.1	N/A
32	Fair Oaks Ave/Northbound US 101 Ramps	PM	Signal	17.1	B	17.1	B	0.002	0.1	N/A
		AM		22.7	C+	23.3	C	0.011	1.1	N/A

TABLE 4.6-7, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Existing Conditions		Existing plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
33	Fair Oaks Avenue/Wolfe Road	PM	Signal	13.6	B	13.7	B	0.013	0.1	N/A
		AM		11.9	B+	12.0	B+	0.006	0.0	N/A
34	Twin Creeks Entrance/ Caribbean Drive**	PM	Signal	8.8	A	8.8	A	0.006	0.0	N/A
		AM		10.1	B+	10.1	B+	0.007	0.0	N/A
35	Moffett Park Drive/Caribbean Drive**	PM	Signal	15.9	B	16.0	B	0.013	0.2	N/A
		AM		15.4	B	15.6	B	0.009	0.1	N/A
36	Lawrence Expressway/Persian Drive-Elko Drive**	PM	Signal	20.8	C+	24.6	C	0.009	-0.1	N/A
		AM		19.3	B-	19.4	B-	0.009	0.1	N/A
37	Lawrence Expressway/Tasman Drive*	PM	Signal	46.8	D	47.0	D	0.000	0.0	N/A
		AM		58.2	E+	58.9	E+	0.014	1.1	N/A
38	Lawrence Expressway/ Lakehaven Drive**	PM	Signal	49.9	D	49.6	D	0.008	-0.2	N/A
		AM		55.9	E+	56.1	E+	0.008	0.3	N/A
39	Lawrence Expressway/NB US 101 Ramps**	PM	Signal	14.9	B	14.8	B	0.008	0.0	N/A
		AM		17.5	B	17.4	B	0.008	0.0	N/A
40	Lawrence Expressway/SB US 101 Ramps**	PM	Signal	13.1	B	13.1	B	0.008	-0.1	N/A
		AM		21.3	C+	21.4	C+	0.008	0.1	N/A
41	Lawrence Expressway/Duane Avenue/Oakmead Parkway**	PM	Signal	36.4	D+	36.3	D+	0.008	-0.1	N/A
		AM		44.4	D	44.8	D	0.001	-0.1	N/A
42	Lawrence Expressway/Arques Avenue**	PM	Signal	27.9	C	28.2	C	0.001	0.0	N/A
		AM		44.4	D	44.6	D	0.006	0.1	N/A

TABLE 4.6-7, CONTINUED

Notes:

Bold font indicates unacceptable operations based on City of Sunnyvale and VTA's LOS E Standard. **Bold and highlighted** indicates significant impacts.

[1] AM = morning peak hour, PM = afternoon peak hour.

[2] Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County Conditions per VTA guidelines. Total control delay for the worst movement is presented for side-street stop-controlled intersections

[3] LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the methodology described in the *2000 HCM*.

[4] Change in the critical volume-to-capacity ratio (V/C) between Existing and Project Conditions.

[5] Change in critical movement delay between Existing and Project Conditions.

[6] Signal warrant based CA MUTCD Warrant 3, Peak Hour Volume (Urban Area)

* CMP intersection with LOS E threshold.

** Regionally significant intersection with LOS E threshold.

Source: Fehr & Peers, August 2013

Peak-Hour Signal Warrant Analysis

The California *Manual of Uniform Traffic Control Devices* (MUTCD) contains a number of guidelines, called warrants, to determine whether the installation of a traffic signal at a particular location is appropriate. The peak-hour signal warrant, one of eight warrants, was evaluated for the unsignalized intersection of Bordeaux Drive/Moffett Park Drive and Borregas Avenue/Moffett Park Drive under Existing and Existing plus Project Conditions. The results indicate that a traffic signal would be warranted at the Bordeaux Drive/Moffett Park Drive intersection, under Existing plus Project Conditions, based on the peak-hour warrant. The Borregas Avenue/Moffett park Drive intersection does not satisfy the peak-hour volume warrant during either peak period. As shown in Table 4.6-7, all other unsignalized intersections are operating at an acceptable LOS.

The peak-hour signal warrant analysis should not serve as the only basis for deciding whether and when to install a traffic signal. To reach such a decision, the full set of warrants should be investigated based on a thorough study of traffic and roadway conditions by an experienced engineer. The decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The responsible state or local agency should undertake regular monitoring of actual traffic conditions and accident data and timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization. On private roads, the Project applicant is responsible for monitoring actual traffic conditions.

Background Conditions

This discussion presents the results of the level of service calculations under Background Conditions with and without the Project. Background No Project Conditions are defined as conditions prior to completion of the proposed development in 2015, which is the projected completion date for the proposed Project. Traffic volumes for Background No Project Conditions comprise existing volumes multiplied by a growth factor per the City of Sunnyvale's most recent traffic model update, plus traffic generated by approved "approved but not yet built" and "not occupied" development in the area. Approved and not occupied projects account for local growth. Background plus Project Conditions are defined as Background No Project Conditions plus traffic generated by the proposed Project.

Background No Project Traffic Volumes

Background Traffic Growth

Growth factors for local roads, collectors, and arterial roadways were developed based on the City of Sunnyvale's travel demand forecasting model. The City of Sunnyvale uses the rates in Table 4.6-8 to estimate annual regional traffic growth based on the roadway classification.

TABLE 4.6-8
ANNUAL GROWTH RATES

Roadway Classification	AM Peak-Hour	PM Peak-Hour
Arterial	2.00%	1.75%
Collector	2.28%	2.34%
Local	0.50%	0.50%

Source: City of Sunnyvale, 2011.

Using year 2013 as the base year for existing conditions, two-year growth factors (to year 2015) were applied to all movements at the 42 study intersections.

Approved and Not Occupied Projects

Vehicle trips from "approved but not yet built" and "not occupied" development projects in the study area were added. Staff from the City of Sunnyvale provided a list of "approved but not yet built" and "not occupied" development projects. Trip generation estimates from approved and not occupied projects that would add traffic to the study intersections were obtained from their respective traffic reports or estimated based on trip generation rates published in the Institute of Transportation Engineers *Trip Generation* (9th Edition). The trips for each of the background projects were then assigned to the roadway network based on the relative locations of complementary land uses, as well as existing and estimated future travel patterns.

Background Improvements

Given that the projected completion year of the Project is 2015, no approved and funded transportation network improvements were assumed to be constructed prior to Project completion. Therefore, the existing roadway network was used for the background analysis.

Background Plus Project Traffic Volumes

Trips generated from the proposed Project (Table 4.6-6) were added to the Background traffic projections to develop traffic volumes for Background plus Project Conditions. The peak hour volumes and lane configurations for the Background Plus Project Conditions are illustrated in Figures 4.6-12 through 4.5-14 at the end of this section.

Background Intersection Levels of Service (LOS)

Table 4.6-9 presents the LOS calculations for the study intersections under Background No Project and Background plus Project Conditions.

Signalized Intersections

Under Background plus Project Conditions, the following signalized intersection is projected to operate at unacceptable service levels (LOS E/F for City intersections and LOS F for regionally significant and CMP intersections) during the identified peak hours.

Mathilda Avenue/Java Drive (#3): The addition of project traffic exacerbates unacceptable LOS F operations during the PM peak hour. However, the addition of Project traffic has only a minimal effect on PM operations and would not increase the overall intersection delay by more than 4 seconds; therefore, this is not considered a significant Project impact.

Unsignalized Intersections

Under Background plus Project Conditions, the following unsignalized intersection is projected to operate at unacceptable service levels (LOS F) during the identified peak hours.

Bordeaux Drive/Moffett Park Drive (#22): during the AM peak hour, the addition of Project traffic degrades intersection operation from acceptable LOS D to unacceptable LOS F. The MUTCD peak hour warrant is not met during the AM peak hour, but is met during the PM peak hour.

Under Background plus Project Conditions the Bordeaux Drive/Moffett Park Drive intersection is projected to operate at unacceptable LOS F during the AM peak hour; however, is not projected to meet the MUTCD peak hour signal warrant volume threshold. In the PM peak hour, the intersection is projected to operate at acceptable LOS E and is projected to meet the MUTCD peak hour signal warrant volume thresholds. While the intersection operates at an unacceptable LOS during the AM peak hour and meets the peak hour volume signal warrant during the PM peak hour, the intersection does not meet the both impact thresholds (LOS F and peak hour signal warrant) during either the AM and PM peak hours. Therefore, based on the City of Sunnyvale's intersection threshold, the Bordeaux Drive/Moffett Park Drive intersection would have a **less-than-significant** impact.

Borregas Avenue/Moffett Park Drive (#25): during the AM peak hour the addition of project traffic degrades intersection operation from acceptable LOS D to unacceptable LOS F. The MUTCD peak hour warrant is not met during the AM peak hour, but is met during the PM peak hour.

Under Background plus Project Conditions the Borregas Avenue/Moffett Park Drive intersection is projected to operate at unacceptable LOS F during the AM peak hour; however, is not projected to meet the MUTCD peak hour signal warrant volume threshold. In the PM peak hour, the intersection is projected to operate at acceptable LOS E and is projected to meet the MUTCD peak hour signal warrant volume thresholds. While the intersection operates at an unacceptable LOS during the AM peak hour and meets the peak hour volume signal warrant during the PM peak hour, the intersection does not meet the both impact thresholds (LOS F and peak hour signal warrant) during either the AM and PM peak hours.

Therefore, based on the City of Sunnyvale's intersection threshold, the Borregas Avenue/Moffett Park Drive intersection would have a **less-than-significant** impact.

The remaining unsignalized intersections are projected to operate at acceptable LOS. The Bordeaux Drive/Moffett Park Drive intersection is projected to satisfy the peak-hour signal warrant during at least one peak hour.

Signalized Intersections – Mathilda Corridor Analysis

Under Background plus project conditions, the following two corridor intersections operate at acceptable service levels (LOS E or better for regionally significant and CMP intersections) using TRAFFIX LOS software during the AM and PM peak hours with the exception of the following:

Mathilda Avenue/Moffett Park Drive (#6): the addition of project traffic exacerbates unacceptable LOS F operations during the AM and PM peak hours under Background plus Project Conditions. Based on the City of Sunnyvale criteria, as a result of the critical delay and increasing by more than four seconds and the critical V/C ratio increase by more than 0.01 between the No Project and the Plus Project Scenarios for Background Conditions, the project is considered to have a significant impact at the Mathilda Avenue/Moffett Park Drive intersection Under the Background plus Project Conditions,

Mitigation Measure 4.6-1: *Prior to occupancy of each phase, the project applicant shall, to the satisfaction of the Public Works Director, provide a Traffic Impact Fee payment to the City. The payment would be based on the amount of development associated with each phase of development and be based on the current TIF rates at the time of payment. Payment of the TIF fee would constitute the project's fair share contribution to the required improvements to reduce potential impacts at the Mathilda/Moffett Park intersection. Required improvements consist of reconfiguration of the SR 237/Mathilda Avenue ramp intersections, as recommended by the 2006 Route 237 Corridor Study:*

- *Shifting the SR 237 Westbound Off-ramp 150 feet to the north to align with Moffett Park/Mathilda Avenue;*
- *Removing SR 237 Westbound On-ramp; and,*
- *Constructing a direct southbound right-turn on-ramp from Mathilda Avenue to US 101 north*

Reconfiguration of the SR 237/Mathilda Avenue ramp intersections would reduce the impact to a less-than-significant level. These improvements are programmed in both the City's Transportation Strategic Program and the Valley Transportation Plan (VTP) 2035 list of constrained projects, and the project is currently in the design/environmental phase. The final design of the Mathilda/237 interchange will be determined in the design phase.

Level of significance after mitigation: Less Than Significant

Mathilda Avenue/Westbound SR 237 Ramps (#7) During the PM peak hour, the addition of project traffic exacerbates unacceptable LOS F operations under Background plus Project Conditions, but operates at acceptable service levels during the AM peak hour under the Existing plus Project and Background plus Project scenarios. Based on the City of Sunnyvale criteria, as a result of the critical delay and increasing by more than four seconds and the critical V/C ratio increase by more than 0.01 between the No Project and the Plus Project Scenarios for Background Conditions, the project is considered to have a significant impact at the Mathilda Avenue/SR 237 Westbound Ramps intersection Under the Background plus Project Conditions,

Mitigation Measure 4.6-1b: The mitigation for this impact is the same as for Mitigation Measure 4.6-1a.

Level of significance after mitigation: Less Than Significant

TABLE 4.6-9
BACKGROUND AND BACKGROUND PLUS PROJECT INTERSECTION LOS

Intersection		Peak Hour[1]	Inter-section Control	Background Conditions		Background plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
1	Northbound US 101 Ramps/Moffett Park Drive	AM	Signal	3.0	A	3.2	A	0.000	0.0	N/A
		PM		8.6	A	12.0	B	0.065	4.3	N/A
2	Lockheed Martin Way/Moffett Park Drive**	AM	Signal	6.6	A	6.6	A	0.000	0.0	N/A
		PM		15.1	B	14.7	B	0.032	1.1	N/A
3	Mathilda Avenue/Java Drive**	AM	Signal	20.9	C+	20.9	C+	0.001	0.0	N/A
		PM		**137.5**	**F**	**136.7**	**F**	0.000	0.0	N/A
4	Mathilda Avenue/5th Avenue**	AM	Signal	13.6	B	13.6	B	0.001	0.0	N/A
		PM		30.8	C	30.6	C	0.000	0.0	N/A
5	Mathilda Avenue/Innovations Way**	AM	Signal	9.1	A	13.4	B	0.022	5.8	N/A
		PM		16.5	B	21.4	C+	0.063	5.7	N/A
6	Mathilda Avenue/Moffett Park Drive**	AM	Signal	**100.8**	**F**	**151.1**	**F**	0.141	76.8	N/A
		PM		**216.0**	**F**	**250.5**	**F**	0.171	44.7	N/A
7	Mathilda Ave/Westbound SR 237 Ramps**	AM	Signal	23.1	C	58.6	E+	0.146	47.1	N/A
		PM		**111.7**	**F**	**138.5**	**F**	0.063	30.9	N/A
8	Mathilda Ave/Eastbound SR 237 Ramps**	AM	Signal	17.9	B	22.1	C+	0.097	5.0	N/A
		PM		16.9	B	26.7	C	0.055	12.1	N/A
9	Mathilda Avenue/Ross Drive**	AM	Signal	12.0	B	12.4	B	0.042	0.7	N/A
		PM		61.1	E	35.6	D+	0.060	21.7	N/A
10	Mathilda Avenue/Ahwanee Avenue**	AM	Signal	18.5	B-	19.1	B-	0.022	1.1	N/A
		PM		43.4	D	53.6	D-	0.030	15.6	N/A

TABLE 4.6-9, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Background Conditions		Background plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
11	Mathilda Avenue/San Aleso Avenue**	AM	Signal	8.4	A	8.6	A	0.027	0.4	N/A
		PM		8.4	A	8.6	A	0.028	0.4	N/A
12	Mathilda Avenue/Maude Avenue*	AM	Signal	30.9	C	33.3	C-	0.028	4.0	N/A
		PM		32.6	C-	34.7	C-	0.016	3.4	N/A
13	Mathilda Avenue/Indio Way**	AM	Signal	13.7	B	14.0	B	0.018	0.4	N/A
		PM		58.0	E+	63.5	E	0.018	8.2	N/A
14	Mathilda Avenue/California Ave**	AM	Signal	18.1	B-	18.9	B-	0.027	1.3	N/A
		PM		53.4	D-	58.0	E+	0.015	6.9	N/A
15	Mathilda Avenue/Washington Avenue**	AM	Signal	20.2	C+	20.8	C+	0.020	0.9	N/A
		PM		20.5	C+	21.2	C+	0.013	1.1	N/A
16	Mathilda Avenue/West McKinley Avenue**	AM	Signal	13.8	B	14.0	B	0.017	0.3	N/A
		PM		17.4	B	17.9	B	0.022	0.8	N/A
17	Mathilda Avenue/Iowa Avenue**	AM	Signal	12.7	B	12.7	B	0.007	0.1	N/A
		PM		16.6	B	17.0	B	0.019	0.6	N/A
18	Mathilda Avenue/Olive Drive**	AM	Signal	10.3	B+	10.3	B+	0.010	0.1	N/A
		PM		12.3	B	12.4	B	0.010	0.2	N/A
19	Mathilda Avenue/El Camino Real**	AM	Signal	45.1	D	47.5	D	0.011	3.2	N/A
		PM		37.6	D+	40.1	D	0.012	4.3	N/A
20	Bordeaux Drive/ Java Drive	AM	Signal	16.0	B	16.7	B	0.006	0.4	N/A
		PM		18.7	B-	19.2	B-	0.032	0.5	N/A
21	Bordeaux Drive/New Roadway (future)	AM	SSSC	N/A	N/A	8.7	A	N/A	N/A	No
		PM		N/A	N/A	8.6	A	N/A	N/A	No

TABLE 4.6-9, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Background Conditions		Background plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
22	Bordeaux Drive /Moffett Park Drive	AM	SSSC	30.7	D	**130.7**	**F**	N/A	N/A	No
		PM		17.6	B	47.8	E	N/A	N/A	**Yes**
23	Borregas Avenue/Caribbean Drive**	AM	Signal	13.4	B	13.3	B	0.022	-0.2	N/A
		PM		13.8	B	14.3	B	0.027	0.7	N/A
24	Borregas Avenue/Java Drive	AM	Signal	15.9	B	16.2	B	0.033	0.5	N/A
		PM		16.0	B	16.6	B	0.034	0.7	N/A
25	Borregas Avenue/Moffett Park Drive	AM	SSSC	28.3	D	**95.7**	**F**	0.207	2.4	No
		PM		14.4	B	16.7	C	0.252	2.5	Yes
26	Crossman Avenue/Caribbean Drive**	AM	Signal	6.6	A	6.7	A	0.000	0.2	N/A
		PM		18.0	B-	18.1	B-	0.005	0.1	N/A
27	Crossman Avenue/Java Drive	AM	Signal	13.0	B	13.1	B	0.011	0.0	N/A
		PM		24.5	C	25.9	C	0.016	1.1	N/A
28	Crossman Avenue/Moffett Park Drive	AM	Signal	13.2	B	13.4	B	0.025	-0.1	N/A
		PM		16.5	B	16.7	B	0.024	0.2	N/A
29	Fair Oaks Avenue/Fair Oaks Way	AM	Signal	18.3	B-	18.6	B-	0.022	0.4	N/A
		PM		25.5	C	26.4	C	0.022	1.1	N/A
30	Fair Oaks Avenue/Tasman Drive	AM	Signal	16.7	B	17.0	B	0.014	0.3	N/A
		PM		18.6	B-	18.7	B-	0.011	0.1	N/A
31	Fair Oaks Avenue/East Weddell Drive	AM	Signal	15.3	B	15.2	B	0.007	-0.2	N/A
		PM		21.4	C+	21.6	C+	0.012	0.3	N/A
32	Fair Oaks Ave/Northbound US 101 Ramps	AM	Signal	17.3	B	17.3	B	0.002	0.1	N/A
		PM		26.1	C	26.7	C	0.008	1.2	N/A

TABLE 4.6-9, CONTINUED

Intersection		Peak Hour[1]	Inter-section Control	Background Conditions		Background plus Project Conditions				
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	Δ in Crit. V/C[4]	Δ in Crit. Delay[5]	Signal Warrant Met?[6]
33	Fair Oaks Avenue/Wolfe Road	AM	Signal	13.0	B	13.0	B	0.012	0.1	N/A
		PM		11.5	B+	11.5	B+	0.01	0.1	N/A
34	Twin Creeks Entrance/Caribbean Drive**	AM	Signal	8.8	A	8.8	A	0.006	0.0	N/A
		PM		10.1	B+	10.1	B+	0.007	0.0	N/A
35	Moffett Park Drive/Caribbean Drive**	AM	Signal	15.9	B	16.0	B	0.013	0.4	N/A
		PM		16.0	B	16.2	B	0.009	0.1	N/A
36	Lawrence Expressway/Persian Drive-Elko Drive**	AM	Signal	21.1	C+	24.4	C	0.009	-0.1	N/A
		PM		19.4	B-	19.5	B-	0.009	0.1	N/A
37	Lawrence Expressway/Tasman Drive**	AM	Signal	46.9	D	47.1	D	0.000	0.00	N/A
		PM		58.2	E+	58.7	E+	0.012	0.7	N/A
38	Lawrence Expressway/Lakehaven Drive**	AM	Signal	49.6	D	49.3	D	0.008	-0.2	N/A
		PM		55.8	E+	56.3	E+	0.013	0.7	N/A
39	Lawrence Expressway/NB US 101 Ramps**	AM	Signal	14.8	B	14.8	B	0.008	0.0	N/A
		PM		17.7	B	17.3	B	0.005	-0.1	N/A
40	Lawrence Expressway/SB US 101 Ramps**	AM	Signal	12.9	B	12.8	B	0.009	0.0	N/A
		PM		21.5	C+	21.6	C+	0.014	0.3	N/A
41	Lawrence Expressway/Duane Avenue/Oakmead Parkway**	AM	Signal	36.6	D+	36.6	D+	0.008	-0.1	N/A
		PM		46.5	D	47.2	D	0.001	-0.1	N/A
42	Lawrence Expressway/Arques Avenue**	AM	Signal	28.5	C	28.8	C	0.002	0.0	N/A
		PM		44.9	C	45.1	D	0.006	0.2	N/A

TABLE 4.6-9, CONTINUED

Notes:

Bold font indicates unacceptable operations based on City of Sunnyvale and VTA's LOS E Standard. Bold and highlighted indicates significant impacts.

[1] AM = morning peak hour, PM = afternoon peak hour.

[2] Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County Conditions per VTA guidelines. Total control delay for the worst movement is presented for side-street stop-controlled intersections

[3] LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the methodology described in the *2000 HCM*.

[4] Change in the critical volume-to-capacity ratio (V/C) between Existing and Project Conditions.

[5] Change in critical movement delay between Existing and Project Conditions.

[6] Signal warrant based CA MUTCD Warrant 3, Peak Hour Volume (Urban Area)

* CMP intersection with LOS E threshold.

** Regionally significant intersection with LOS E threshold.

Source: Fehr & Peers, August 2013

CONGESTION MANAGEMENT PROGRAM FACILITIES

Impact 4.6-2: The proposed project could conflict with an applicable congestion management program, including, but not limited to LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways. (Less Than Significant With Mitigation)

The Santa Clara County Valley Transportation Authority (VTA) is the applicable congestion management agency responsible for establishing LOS standards for CMP-designated roads and highways.

VTA Intersection Impact Criteria

The LOS standard for CMP intersections is LOS E. Traffic impacts at CMP intersections would occur when the addition of traffic associated with implementation of a project causes:

- Intersection operations to deteriorate from an acceptable level (LOS E or better) under the Existing Conditions to an unacceptable level (LOS F); or
- Exacerbation of unacceptable operations by increasing the average critical delay by more than 4 seconds and increasing the critical volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS F.
- The V/C ratio increases by 0.01 or more at an intersection with unacceptable operations (LOS F) when the change in critical delay is negative (i.e., decreases). This can occur if the critical movements change.

No deficient levels of service were found, or forecast to occur, at this intersection, and impacts would be less than significant; refer to Tables 4.6-3 and 4.6-7, earlier in this section.

VTA Freeway Impact Criteria

The LOS standard for CMP freeway segments is LOS E. Traffic impacts on CMP freeway segments occur when the addition of project traffic causes:

- Freeway segment operations to deteriorate from an acceptable level (LOS E or better) under the Existing Conditions to an unacceptable level (LOS F); or
- An increase in traffic of more than one percent of the capacity of the segments that operate at LOS F under Existing Conditions.

Existing Plus Project Freeway Levels of Service (LOS)

Freeway segments of US 101 and SR 237 were analyzed during the AM and PM peak hours by calculating the amount of Project traffic projected to be added to these freeway segments. To be conservative, no Project trips were assigned to HOV lanes. Table 4.6-10 presents the estimated number of trips added to the freeway segments under Existing plus Project Conditions and the estimated densities and service levels.

TABLE 4.6-10
EXISTING PLUS PROJECT FREEWAY SEGMENT LOS

Freeway Segment	Direction	Peak Hour[1]	Capacity (vphpl)[2]	Existing Conditions		Existing plus Project Conditions			
				Density[3]	LOS[4]	Trips[5]	Density	LOS	% Impact[6]
US 101, Ellis Street to SR 237	NB	AM	6900	**101**	**F**	22	101	F	0.32%
		PM	6900	**81**	**F**	103	**84**	**F**	**1.49%**
	SB	AM	6900	37	D	106	38	D	1.54%
		PM	6900	39	D	13	39	D	0.19%
US 101, SR 237 to Mathilda Avenue	NB	AM	6900	**71**	**F**	0	71	F	0.00%
		PM	6900	**34**	**F**	0	34	D	0.00%
	SB	AM	6900	26	C	0	26	C	0.00%
		PM	6900	25	C	0	25	C	0.00%
US 101, Mathilda Avenue to Fair Oaks Avenue	NB	AM	6900	**74**	**F**	106	**75**	**F**	**1.54%**
		PM	6900	26	C	13	26	C	0.19%
	SB	AM	6900	27	D	22	27	D	0.32%
		PM	6900	32	D	103	33	D	1.49%
US 101, Fair Oaks Avenue to Lawrence Expressway	NB	AM	6900	**61**	**F**	106	**62**	**F**	**1.54%**
		PM	6900	28	D	13	28	D	0.19%
	SB	AM	6900	30	D	22	30	D	0.32%
		PM	6900	38	D	103	39	D	1.49%
SR 237, Maude Avenue to US 101	EB	AM	4400	**60**	**F**	106	**61**	**F**	**2.41%**
		PM	4400	25	C	26	25	C	0.59%
	WB	AM	4400	31	D	22	31	D	0.50%
		PM	4400	60	F	103	**63**	**F**	**2.34%**
SR 237, US 101 to Mathilda Avenue	EB	AM	4400	**74**	**F**	211	**78**	**F**	**4.80%**
		PM	4400	32	D	13	32	D	0.30%
	WB	AM	4400	57	E	22	57	E	0.50%
		PM	4400	42	D	181	44	D	4.11%
SR 237,	EB	AM	4600	58	E	22	58	E	0.48%

TABLE 4.6-10, CONTINUED

Freeway Segment	Direction	Peak Hour[1]	Capacity (vphpl)[2]	Existing Conditions		Existing plus Project Conditions			
				Density[3]	LOS[4]	Trips[5]	Density	LOS	% Impact[6]
Mathilda Avenue to Fair Oaks Ave		PM	4600	47	E	103	49	E	2.24%
	WB	AM	6900	86	F	109	**88**	**F**	**1.58%**
		PM	6900	100	F	13	100	F	0.19%
SR 237, Fair Oaks Avenue to Lawrence Expressway	EB	AM	4600	37	D	22	37	D	0.48%
		PM	4600	**87**	**F**	103	**93**	**F**	**2.24%**
	WB	AM	4600	**58**	**E**	109	**60**	**F**	**2.37%**
		PM	4600	75	F	13	75	F	0.28%

Notes:
Bold font indicates unacceptable operations based on VTA's LOS E Standard.
1 AM = morning peak hour, PM = afternoon peak hour.
2 vphpl = vehicles per hour per lane
3 Measured in passenger cars per mile per lane.
4 LOS = level of service.
5 Project trips added to individual freeway segments
6 Percent impact on mixed flow lanes determined by dividing the number of Project trips by the freeway segment's capacity.
Source: 2010 Monitoring and Conformance Report, VTA, May 2011.

The proposed Project would add trips greater than one percent of the freeway segment capacity to the following freeway segments already operating at LOS F:

- US 101, Northbound, Ellis Street to SR 237 (PM peak hour)
- US 101, Northbound, Mathilda Avenue to Fair Oaks Avenue (AM peak hour)
- US 101, Northbound Fair Oaks Avenue to Lawrence Expressway (AM peak hour)
- SR 237, Eastbound, US 101 to Maude Avenue (AM peak hour)
- SR 237, Westbound, US 101 to Maude Avenue (PM peak hour)
- SR 237, Eastbound, Mathilda Avenue to US 101 (AM peak hour)
- SR 237, Westbound, Fair Oaks Avenue to Mathilda Avenue (AM peak hour)
- SR 237, Eastbound Fair Oaks Avenue to Lawrence Expressway (PM peak hour)
- SR 237, Westbound Fair Oaks Avenue to Lawrence Expressway (AM peak hour)

Therefore, the Project would have a significant and unavoidable impact at the identified study freeway segments. The mitigation for freeway impacts is typically the provision of additional capacity in the form

of additional mainline or auxiliary lanes. Several freeway improvements were identified in the *Valley Transportation Plan 2035* below to improve freeway operations on the affected segments:

- Adding an auxiliary lane on US 101 from Great America Parkway to Lawrence Expressway (VTP ID H27)
- Converting HOV lanes to express lanes on SR 237 from I-880 to Mathilda Avenue (VTP ID H9)
- Building new HOV/express lanes on SR 237 between Mathilda Avenue and SR 85 (VTP H11).

The freeway improvement projects listed in the *Valley Transportation Plan 2035* are financially constrained. These improvements are anticipated to relieve traffic congestion contributed to by the Project and a fair share contribution to these projects will constitute mitigation.

Mitigation Measure 4.6-2: *Prior to occupancy of each phase, the project applicant shall, to the satisfaction of the Public Works Director, provide a fair share contribution to freeway improvements were identified in the Valley Transportation Plan (VTP) 2035 to improve freeway operations on the affected segments:*

- *Convert HOV lanes to express lanes on US 101 from SR 85 in Mountain View to San Jose (VTP ID H5)*
- *Convert HOV lanes to express lanes on SR 237 from I-880 to Mathilda Avenue (VTP ID H9)*
- *Construct new HOV/express lanes on SR 237 between Mathilda Avenue and SR 85 (VTP H11).*

The payment would be based on the amount of development associated with each phase of development and be based on the VTA project estimates at the time of payment. The freeway improvement projects listed in the VTP 2035 are financially constrained (financially constrained projects are planned project for which VTA anticipates full funding within the timeframe of the VTP 2035 and are currently under design). These improvements are anticipated to relieve traffic congestion added by the project. Therefore a fair share contribution to these regional projects, which VTA is actively designing, would constitute mitigation toward the following identified freeway impacts:

- *US 101: Convert HOV lanes to express lanes from SR 85 in Mountain View to San Jose (VTP ID H5)*
    - *Northbound, Ellis Street to SR 237*
    - *Northbound, Mathilda Avenue to Fair Oaks Avenue*
    - *Northbound Fair Oaks Avenue to Lawrence Expressway*
- *SR 237: Convert HOV lanes to express lanes from I-880 to Mathilda Avenue (VTP H9)*
    - *Westbound, Fair Oaks Avenue to Mathilda Avenue*
    - *Eastbound/Westbound, Fair Oaks Avenue to Lawrence Expressway*
- *SR 237 – Construct new HOV/express lanes between Mathilda Avenue and SR 85 (VTP H11)*

- *Eastbound/Westbound, US 101 to Maude Avenue*
- *Eastbound, Mathilda Avenue to US 101*

Level of Significance After Mitigation: *Less than Significant, because payment of fair share contributions are considered mitigation.*

Existing Plus Project Mathilda Avenue Microsimulation Analysis

As discussed earlier in this section, the study intersections on the Mathilda Avenue corridor between Moffett Park Drive and Almanor Avenue are closely spaced and the corridor experiences operational issues beyond simple intersection LOS primarily due to vehicle weaving. The TRAFFIX analysis software program does not accurately capture the operations of the Mathilda Avenue corridor since it does not evaluate the interactions of closely spaced and coordinated intersections. To better estimate and assess the projected traffic operations, and the weaving operations at the US 101/Mathilda Avenue interchange, along Mathilda Avenue between Moffett Park Drive and Almanor Avenue, a micro simulation analysis was conducted. When analyzed in this manner, the intersections along Mathilda Avenue operate significantly worse than what was projected using standard HCM 2000 methodologies (TRAFFIX), particularly during the AM peak hour, predominantly due to movements from the freeway ramps and side streets being blocked by queued traffic along Mathilda Avenue which has spilled back from downstream intersections due to lack of vehicular storage.

The micro simulation analysis was also used to assess the freeway ramp queuing at both the SR 237 and US 101 interchanges along Mathilda Avenue. Queuing on the SR 237 and US 101 ramps currently occurs due to the tight and congested weaving movements from the ramps to Mathilda Avenue. Under Existing plus Project Conditions, it is projected that the vehicular queues on the freeway ramps would not spill back onto the freeway mainline, with the exception of the following:

- US-101 SB Off-Ramp / Mathilda Avenue during the AM peak hour – Projected queue length is 692 feet and the existing ramp length is 618 feet.

During the AM peak hour, every intersection operates at a substandard level with the exception of Mathilda Avenue /Invocations Way – New Roadway. This is in contrast to what was reported using the standard HCM LOS methodologies, where no deficiencies were shown in the corridor. This is because HCM methodologies only measure the capacity of a single intersection and do not take into account delay caused by queues from downstream intersections or deficient weaving movements. Based on this analysis, it can be concluded that the tight intersection spacing, high traffic conflicting traffic volumes within the limited weave points and lack of vehicular storage between intersections is the predominate cause of the poor operations within the segment of Mathilda Avenue. These issues result in both excessive delays and low travel speeds throughout the corridor. The mitigation described in Mitigation Measure 4.6-1 would reduce potential impacts identified in this scenario to less than significant.

Background Plus Project Mathilda Avenue Microsimulation Analysis

As described in the Existing Plus Project Mathilda Avenue Microsimulation Analysis earlier in this section, the study intersections on the Mathilda Avenue corridor between Moffett Park Drive and Almanor Avenue are closely spaced and the corridor experiences operational issues beyond simple intersection LOS primarily due to vehicle weaving. When analyzed using a microsimulation analysis, the intersections along Mathilda Avenue operate significantly worse than what was projected using standard HCM 2000 methodologies (TRAFFIX). During the AM peak hour this is predominantly due to movements from the freeway ramps and side streets being blocked by queued traffic along Mathilda Avenue which has spilled back from downstream intersections due to lack of vehicular storage. During the PM peak hour the closely spaced intersections and heavy weaving movements act as a choke point for the heavy southbound vehicular movements projected along Mathilda Avenue.

The micro simulation analysis was also used to assess the freeway ramp queuing at both the SR 237 and US 101 interchanges along Mathilda Avenue. Queuing on the SR 237 and US 101 ramps currently occurs due to the tight and congested weaving movements from the ramps to Mathilda Avenue. Under Background plus Project Conditions, it is projected that the vehicular queues on the freeway ramps would not spill back onto the freeway main lanes, with the exception of the following:

- US-101 NB Off-Ramp / Mathilda Avenue (north) during the AM peak hour
- SR-237 WB Off-Ramp/Mathilda Avenue during the AM peak hour
- SR-237 EB Off-Ramp/Mathilda Avenue during the AM peak hour
- US-101 NB Off-Ramp/Mathilda Avenue (south) during the PM Peak hour

Similar to Existing Plus Project conditions during the AM peak hour, every intersection is projected to operate at a substandard level with the exception of Mathilda Avenue / Invocations Way – New Roadway. However, as projects within the Project area develop, vehicular volumes along Mathilda Avenue will increase significantly, resulting in deficiencies in the PM peak hour as well. This is in contrast to what was reported using the standard HCM LOS methodologies, where the only deficiencies identified in the corridor were at Moffett Park Drive and the SR 237 westbound ramps during the PM peak hour. This is because HCM methodologies only measure the capacity of a single intersection and do not take into account delay caused by queues from downstream intersections or deficient weaving movements. Based on this analysis, it can be concluded that the tight intersection spacing, high traffic conflicting traffic volumes within the limited weave points and lack of vehicular storage between intersections is the predominate cause of the poor operations within the segment of Mathilda Avenue. These issues result in both excessive delays and low travel speeds throughout the corridor. The mitigation described in Mitigation Measure 4.6-1 would reduce potential impacts identified in this scenario to less than significant.

AIR TRAFFIC PATTERNS

Impact 4.6-3: The proposed project could result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks. (Less Than Significant With Mitigation)

The Project site is located within the Airport Influence Area (AIA) of Moffett Field Airport, less than one mile away. However, implementation of the Project would not result in a change in air traffic patterns. As discussed previously in Section 4.1, *Land Use*, the Project applicant is required to notify the Federal Aviation Administration (FAA) as required by FAR Part 77 Subpart B on FAA Form 7460-1. Thus, the height of the proposed corporate campus is not anticipated to pose hazards to flight that could increase the risk of an accident occurring, nor would a change in air traffic patterns be necessary. Implementation of Mitigation Measure 4.1-1a and 4.1-1b would reduce potential impacts to a less than significant level; refer to Section 4.1 for additional information.

Mitigation Measure 4.6-3: *Refer to Section 4.4-1, Mitigation Measures 4.1-1a and 4.1-1b.*

INCREASED HAZARDS DUE TO A DESIGN FEATURE

Impact 4.6-4: The proposed project could substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (Less Than Significant)

The Project does not include any hazardous design features such as sharp curves or dangerous intersections or incompatible uses. All roadways would be designed consistent with City and County standards. Therefore, a less than significant impact would occur in this regard and no mitigation is required.

Mitigation Measure 4.6-4: *None required.*

EMERGENCY ACCESS

Impact 4.6-5: The proposed project could result in inadequate emergency access. (Less Than Significant)

The proposed Project access will be provided via several driveways located on Bordeaux Drive and Borregas Avenue, as well as a single right-in/right-out driveway located on Mathilda Avenue providing access to a small surface parking lot serving Building B5. Parking Structure 1 access will be provided via two driveways located on Borregas Avenue, while Parking Structure 2 access will be via a driveway located on Bordeaux Drive and a secondary driveway on Borregas Avenue. An additional auxiliary surface parking lot will be located north of the Santa Clara Water District Creek and east of Bordeaux

Drive. This lot will take access via two driveways located on Bordeaux Drive, as well as a proposed bridge structure over the creek connecting the lot to Building B4.

Based on a preliminary review of the draft Project site plan, all Project driveways are well spaced, properly aligned with opposing driveways and provide adequate distance away from public intersections. This design would help to disperse Project traffic to numerous points and help to avoid heavy turning movements into the Project site, which would help to avoid queuing associated with vehicles entering the Project site from spilling back into downstream public intersections. Additionally, this design would ensure that sufficient access is maintained for emergency vehicles traveling through the Project area, consistent with City and County roadway design guidelines.

Because the Project design includes adequate emergency access and would be consistent with City and County standards for emergency vehicle access, a less than significant impact would occur in this regard.

Mitigation Measure 4.6-5: *None required.*

PUBLIC TRANSIT, BICYCLE, OR PEDESTRIAN FACILITIES

Impact 4.6-6: The proposed project could conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (Less Than Significant)

Public Transit

The Project would generate demand for existing transit services in the area, which can be accommodated by the existing supply. The existing load factors (average number of riders per trip) for Light rail Line 902 and Routes 26, 54, 120, 121, 122, 321, and 328 were provided by VTA. Light rail trains have seated capacities of 65 per car and buses have seated capacities of 38. The load factor for Line 902 at the Lockheed Martin Transit Station is 0.34 (22 people). For Routes 26 and 54, the load factors are 0.49 (19 people) and 0.33 (13 people), respectively. The express routes have load factors between 0.38 (14 people) and 0.52 (20 people).

The transit service within the immediate Project area operates well below capacity, and additional trips generated by the proposed Project could be accommodated by existing light-rail and bus service. The area also has a well-used shuttle system (see Figure 4.6-3 earlier in this section) that would be able to accommodate additional riders.

The Lockheed Martin Transit Center, where most of the available transit service is focused, would be readily accessible to pedestrians and bicyclists generated by the Project because the facility is located approximately 900 feet north of the Project site on Mathilda Avenue. This is a short and manageable walking distance for most pedestrians. Also as noted previously, the Project site will include two east-west pedestrian pathways, through the Project site, designed to provide a linkage between the buildings

located on the eastern portion of the site to Mathilda Avenue where the transit center is located. Therefore, the Project would have a less than significant impact on transit service.

Bicycle Facilities

Near the Project site, there are bicycle lanes in both directions provided on both Bordeaux Drive between Moffett Park Drive and Java Drive and Borregas Avenue between Maude Avenue and Caribbean Drive. Bicycle lanes are provided on Mathilda Avenue (north of Bordeaux Drive) and Moffett Park Drive (east of Bordeaux Drive). A bicycle route is designated on Mathilda Avenue from Bordeaux Drive to Innovation. A discontinuous bicycle path extends from Garner Drive to Weddell Drive along the north side of US 101 east of Mathilda Avenue.

Based on a preliminary review of the draft Project site plan, the proposed Project would not jeopardize pedestrian and/or cyclist safety or comfort on the key pedestrian and bicycle facilities accessing the proposed site, nor would the Project substantially increase hazards due to a design feature, or would conflict with the adopted policies plans, or programs that support alternative transportation. Therefore, the proposed Project is not anticipated to adversely impact to the pedestrian and bicycle networks adjacent to the Project site, based on the standard outlined in Appendix G of the *California Environmental Quality Act (CEQA) Guidelines.* A less than significant impact would occur in this regard, and no mitigation is required.

Pedestrian Facilities

Sidewalks would be provided along the perimeter of the Project along the north side of Moffett Park Drive, both sides of Bordeaux Drive, the westside of Borregas Avenue and both sides of the proposed new roadway. Pedestrian connections would be provided between the proposed buildings, parking lots, and parking garages. The Project also includes two distinct internal pedestrian paths designed to provide a direct link through the Project site between the buildings located east of Bordeaux Drive and Mathilda Avenue (located along the western boundary of the site) where the Lockheed Martin transit station is located. The pedestrian paths would terminate on Mathilda Avenue just south of the Mathilda Avenue/Innovation Way-Proposed New Roadway intersection, where pedestrians would need to cross to the west side of Mathilda Avenue and then travel north approximately 900 feet to reach the Lockheed Martin Transit station. Due to the potential increase in pedestrian traffic between the Lockheed Marin Transit station and the Project site, it is recommended that countdown pedestrian signal heads be installed at the Mathilda Avenue/Innovation Way-Proposed New Roadway intersection when the westbound leg (Proposed New Roadway) of the intersection is implemented.

Both internal paths would require midblock pedestrian crossings on Bordeaux Drive. Both crossing locations would be located to the north of the access point to Parking Structure 2; therefore, high traffic volumes are not anticipated at either location. However, it is still recommended that stripped crosswalks and in pavement flashing yellow beacons be provided at both midblock crossing locations to help alert drivers of crossing pedestrians. Raised crosswalks would also be ideal at these locations and should be

further evaluated if significant pedestrian volumes are observed with the implementation of the proposed Project. Additional measures such as advanced limit lines and shark teeth could also be implemented to alert motorists of the crossing point. It is also recommended that the southern pedestrian path across the Project site be aligned with the edge of the parking aisle instead of mid-aisle. While this location may result in additional conflict points between vehicles and pedestrians, drivers will already be looking for conflicting vehicular movements at this point and will naturally be more alert to pedestrian movements.

Implementation of the above-recommended design features would ensure that impacts relative to pedestrian facilities remain at a less than significant level.

Mitigation Measure 4.6-6: *None required.*

PARKING

Impact 4.6-7: The proposed project could conflict with adopted policies, plans, or programs regarding parking. (Less Than Significant)

The MPSP provides off-street parking and bicycle requirements for the Moffett Park area.

Vehicle Parking

The MPSP requires office land uses with the MPSP area to prove a minimum off-street parking supply at a rate of one space per 300 s.f. of gross floor area; or 3.3 spaces per 1,000 s.f. and a maximum rate of one space per 250 s.f. of gross floor area (4 spaces per 1000 s.f.). The City of Sunnyvale's Municipal Code (section 19.46.100) requires that non-residential hotel uses provide 0.8 space per room and a maximum rate of 1.2 spaces per room. Table 4.6-11 summarizes the proposed parking supply and parking requirements for the Moffett Place expansion projects. Based on the City of Sunnyvale's Municipal Code (section 19.46.050) up to 50 percent of the spaces can be designed for compact cars.

TABLE 4.6-11
VEHICLE PARKING REQUIREMENTS

Project Site	Project Size	Required Parking Supply[1]	Proposed Parking Supply	Meet Parking Requirement?
Moffett Place Office Development[2]	1,729,554 s.f.	5,766	5,766	Yes
Hotel Expansion	307 rooms	246	278	Yes

Notes:

1. MPSP requires minimum parking supply ratio of 1 space per 300 s.f. of gross floor area of office use. The City of Sunnyvale Municipal Code required 0.8 space per room for hotel uses.

2. The square footage for the proposed office development excludes the 50,000-sf amenities building, since this would only be for use of Moffett Place employees.

Source: Fehr & Peers, July 2013.

Based on the requirements of the MPSP the project would be required to provide a total of 5,766 parking spaces for the office development assuming that the 50,000 amenities building would be for exclusive use of project employees. The hotel develop would require 246 spaces based on the City's Municipal Code. The Moffett Place Office Development proposes to provide 5,766 parking spaces, which meets the required by the MPSP. Similarly, the hotel development proposes to provide 278 spaces, which exceeds the City of Sunnyvale Municipal Code requirement by 32 spaces.

Bicycle Parking

The MPSP requires office uses to provide one bicycle parking spaces per 6,000 square feet of gross floor area, and hotel users need to provide one space per every 30 rooms and 30 employees. Of that requirement, 75 percent needs to be Class I parking facilities and 25 percent Class II facilities. Class I facilities protect the entire bicycle from theft, vandalism, and inclement weather, and are appropriate for long-term storage. Examples include bike lockers, rooms with key access, guarded parking areas, and valet/check-in parking. Class II parking facilities include bicycle racks to which the frame and at least one wheel can be secured with a user-provided lock. The MPSP bicycle requirements are the same as recommended by the VTA in their TIA Guidelines.

The Moffett Park Office Development would need to supply 300 bicycle spaces on the Project site and 33 spaces for the hotel. Of these, 75 percent (225 and 25 spaces, respectively) will be Class I bicycle lockers and remaining 25 percent (75 and 8 spaces, respectively) will be Class II bicycle facilities. With the provision of these bicycle parking facilities, the Project would meet City and MPSP guidelines.

CONSTRUCTION IMPACTS

Impact 4.6-8: The proposed project could result in inadequate roadway operations as a result of construction related traffic. (Less Than Significant With Mitigation)

Construction of the Project is anticipated to occur approximately during the same time and is expected to occur over a one-year period. General recommendations on construction-related mitigations, such as limiting times when trucks would be permitted to travel to/from the sites and restricting routes to prevent impacting neighboring communities, are provided.

Mathilda Avenue is the City-designated truck route that provides the most direct access to the Project sites. In general, truck access to the site should be limited to Mathilda Avenue, Moffett Park Drive, Bordeaux Drive and Borregas Avenue, since these provide the most direct access.

As shown in Table 4.6-7 earlier in this section, all of the study intersections near the Project site operate at an acceptable LOS under Existing plus Project Conditions, with the exception of the following:

- Bordeaux Drive/Moffett Park Drive (LOS F – PM Peak Hour)

During the peak of Project construction, it is estimated that approximately 425 workers will be needed onsite. If a worst case scenario is assumed, where all workers individually drive a personal vehicle to the Project site and arrive during the AM peak hour and depart during the PM peak hour, this would result in 425 AM inbound trips and 425 PM outbound trips. While this traffic is significantly lower than what the proposed Project is projected to generate, this would still result in a high concentration of traffic maneuvering through an unsignalized intersection during a peak period, and could result in poor operations along Moffett Park Drive due to turning movement queuing.

Also, as discussed under Existing Conditions, the intersections of the Mathilda Avenue corridor between Moffett Park Drive and Almanor Avenue are closely spaced and the corridor experiences operational issues beyond simple intersection LOS primarily due to vehicle weaving.

The above-mentioned conditions would result in a significant traffic impact during construction of the Project.

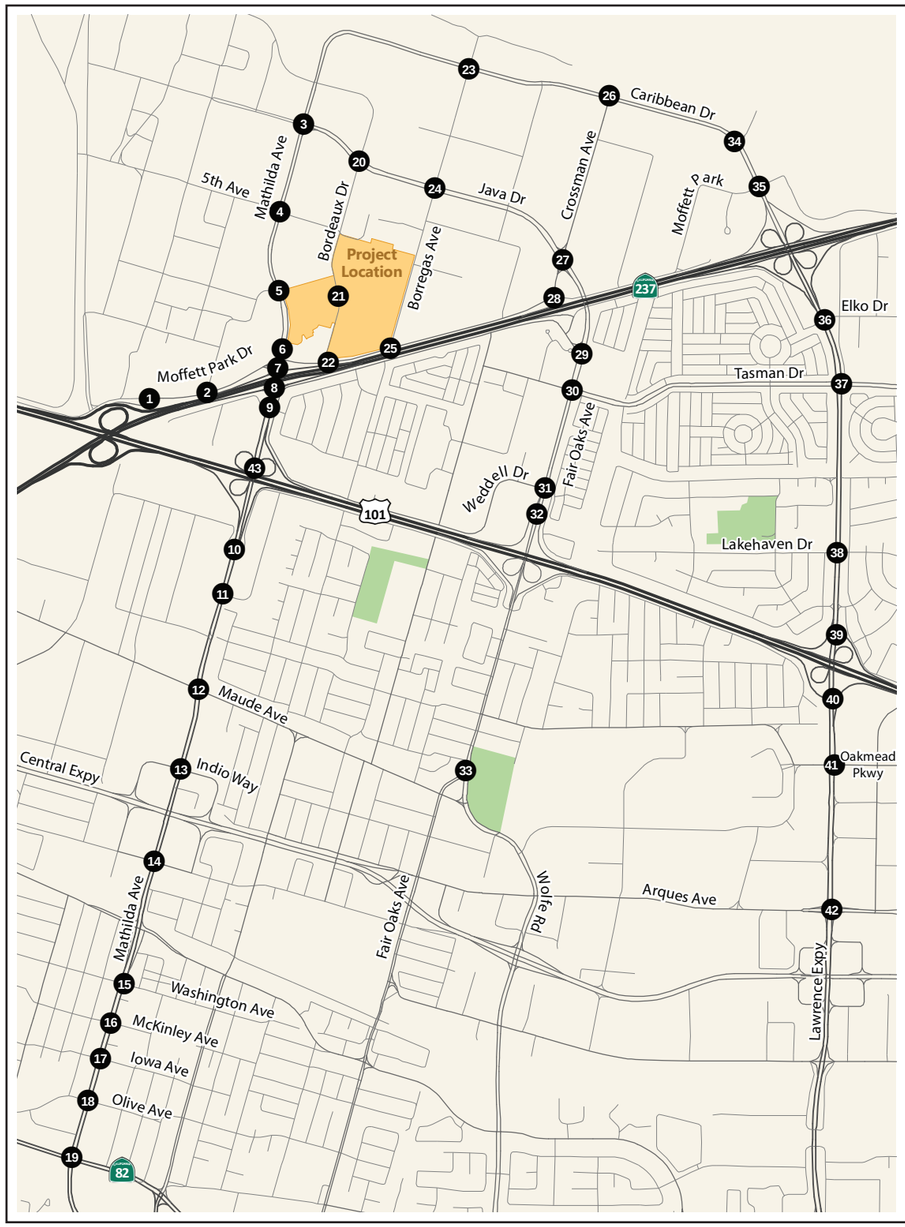
Mitigation Measure 4.6-8: *Prior to issuance of a grading permit, the applicant shall, to the satisfaction of the Public Works Director, receive approval of a traffic control plan that restricts directional access to the construction site. In-bound construction traffic from Mathilda Avenue shall be directed to access the construction site via Mathilda Avenue or Moffett Park Drive, while outbound construction traffic shall be restricted to Java Drive, eastbound Moffett Park Drive or as approved by the Public Works Director.*

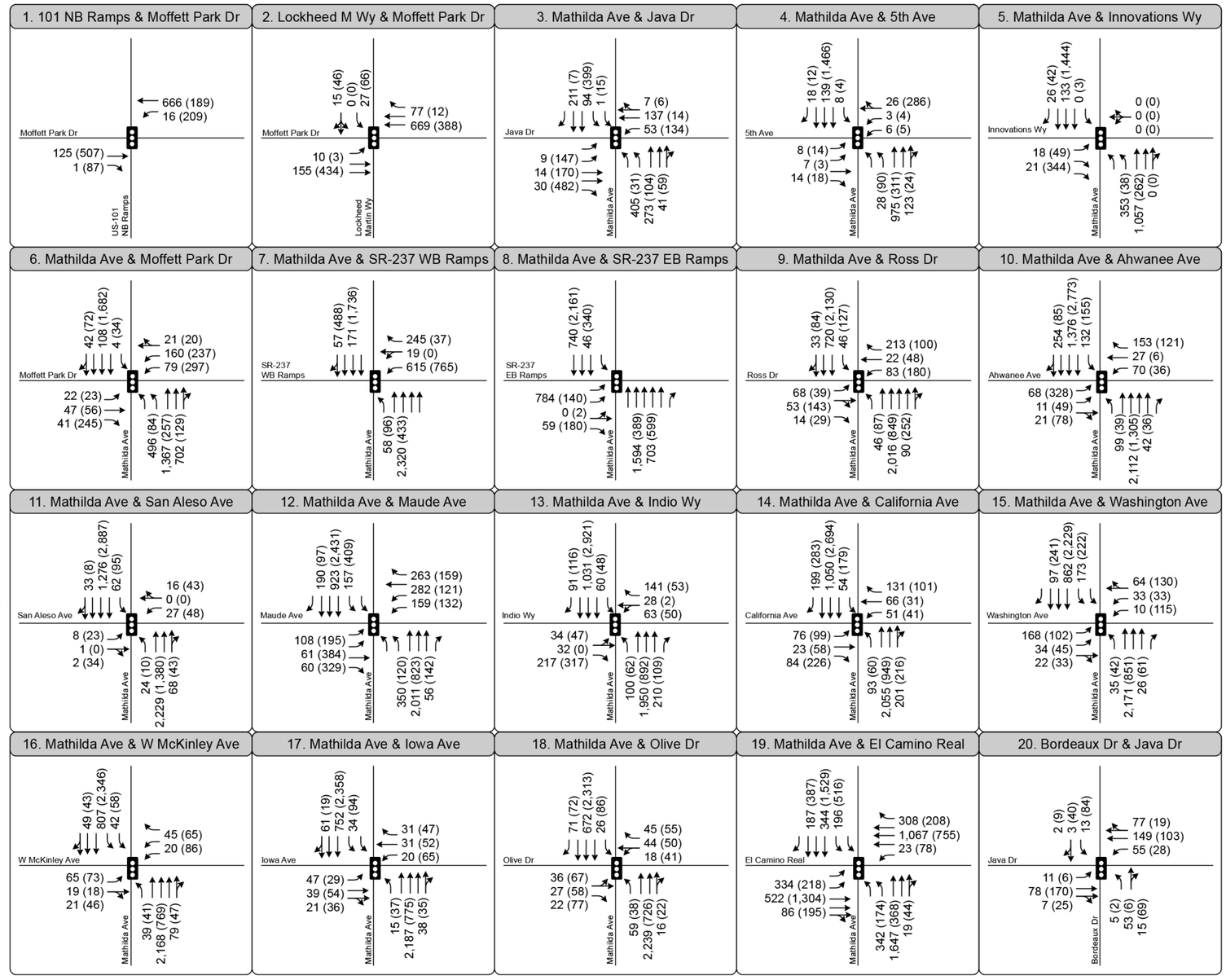
The traffic control plan shall prohibit truck access to the site during peak commute times (7 AM to 9 AM and 4 PM to 6 PM) to limit potential impacts to the operations of Mathilda Avenue. Alternative times may be considered in specific cases as approved by the Public Works Director.

Level of significance after mitigation: *Less than significant impact.*

REFERENCES – TRAFFIC AND TRANSPORTATION

Fehr & Peers, 2013. Moffett Place Transportation Impact Analysis Study (TIA). August 2013.



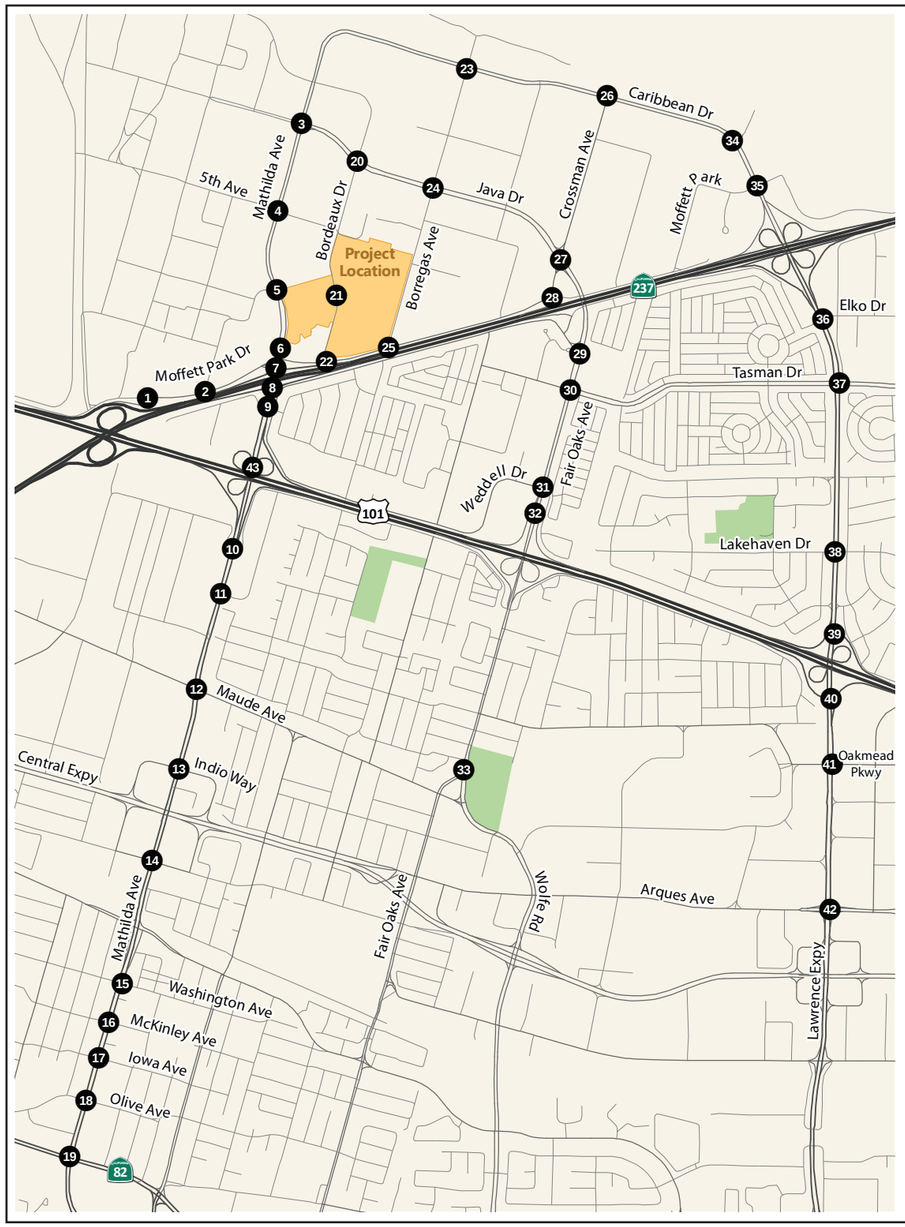


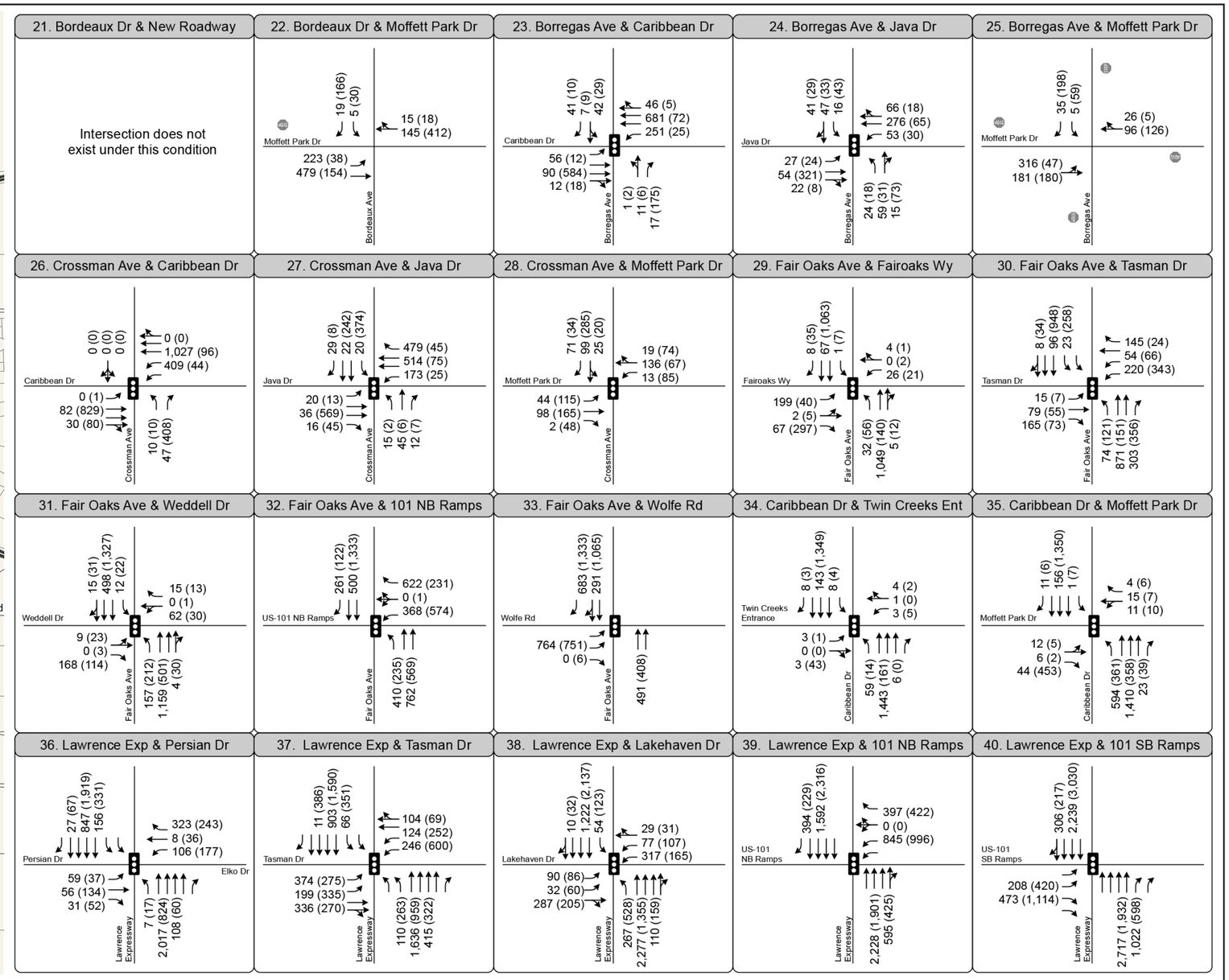
Source: Fehr & Peers, July 2013.

Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-6

Peak Hour Traffic Volumes and Lane Configurations Existing Conditions



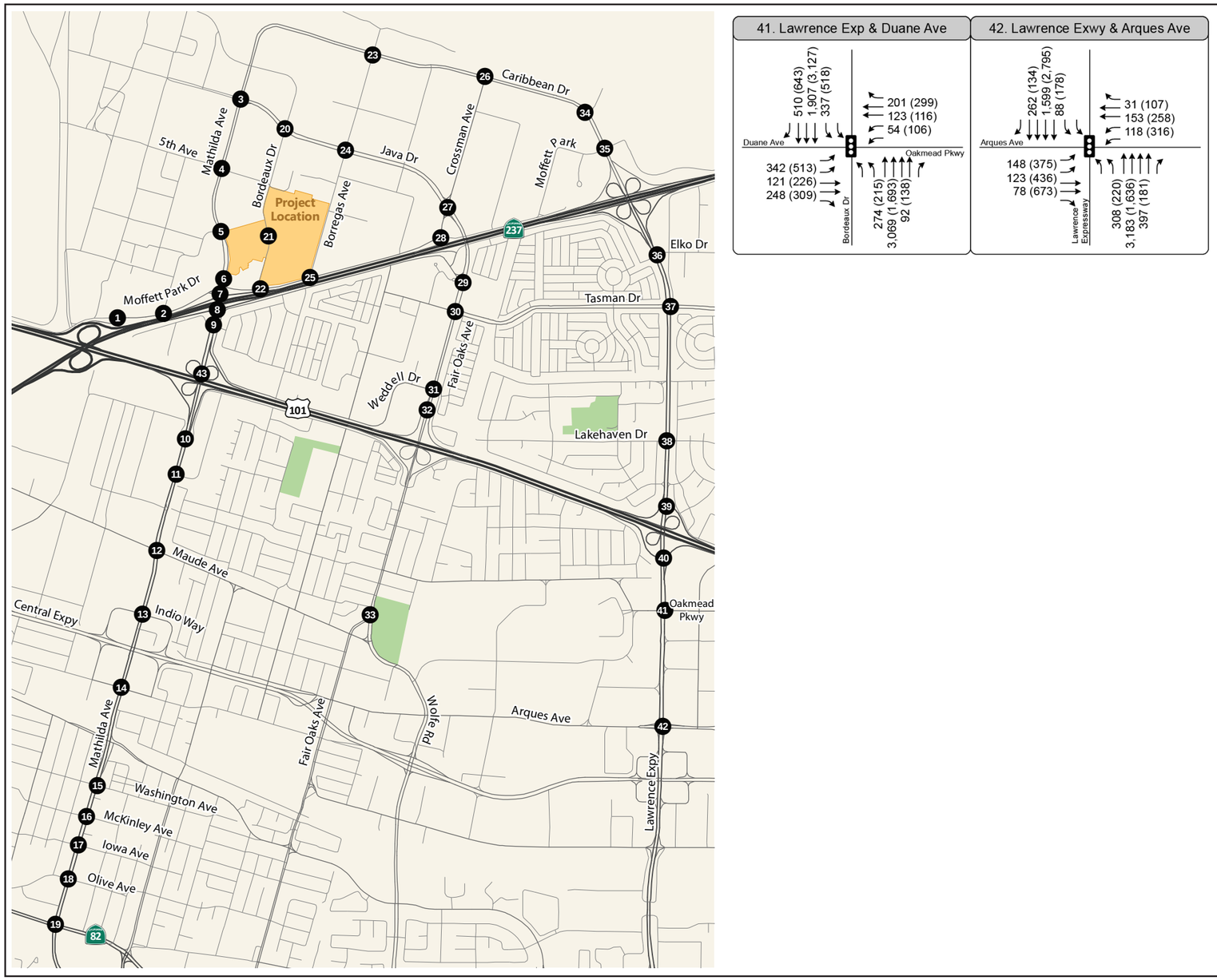


Source: Fehr & Peers, July 2013.

Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-7

Peak Hour Traffic Volumes and Lane Configurations Existing Conditions



Source: Fehr & Peers, July 2013.

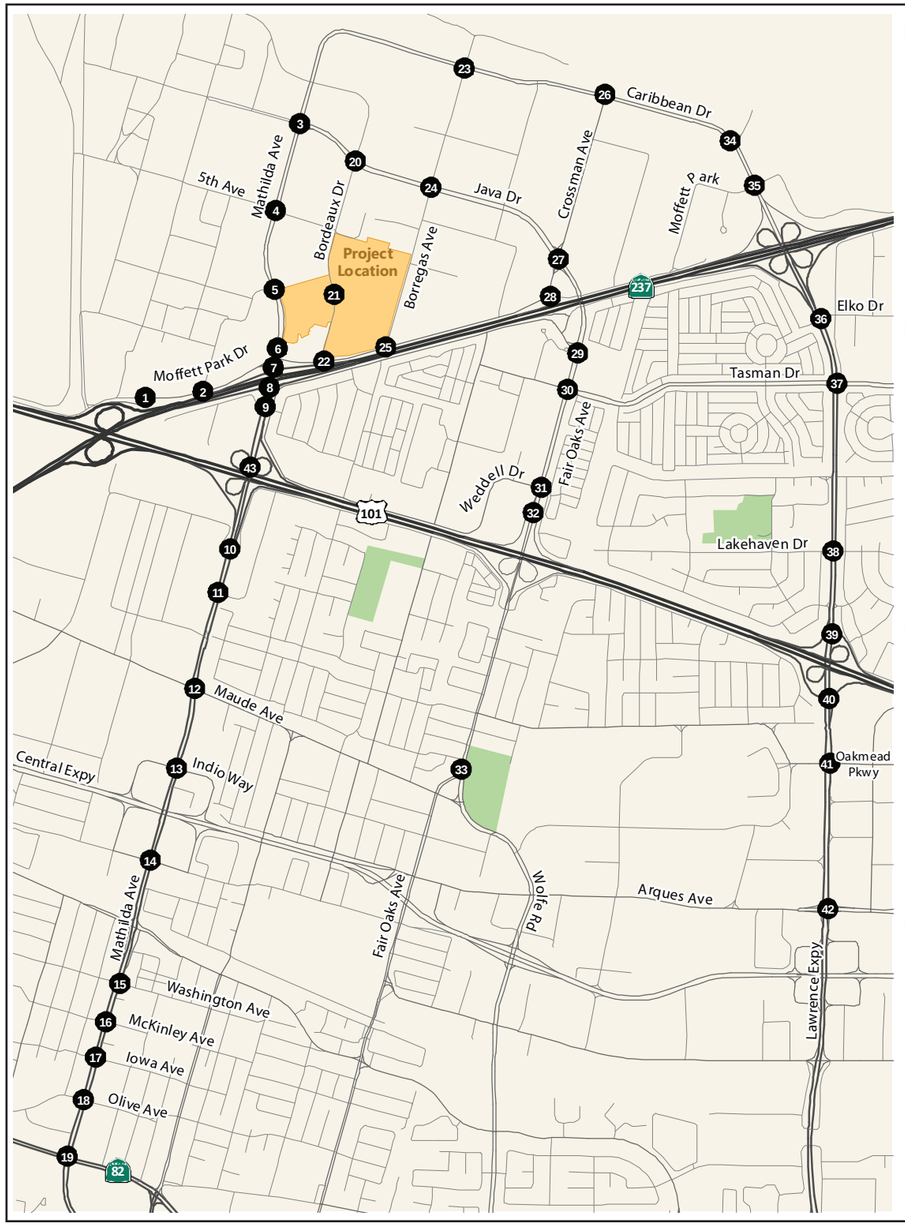
Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

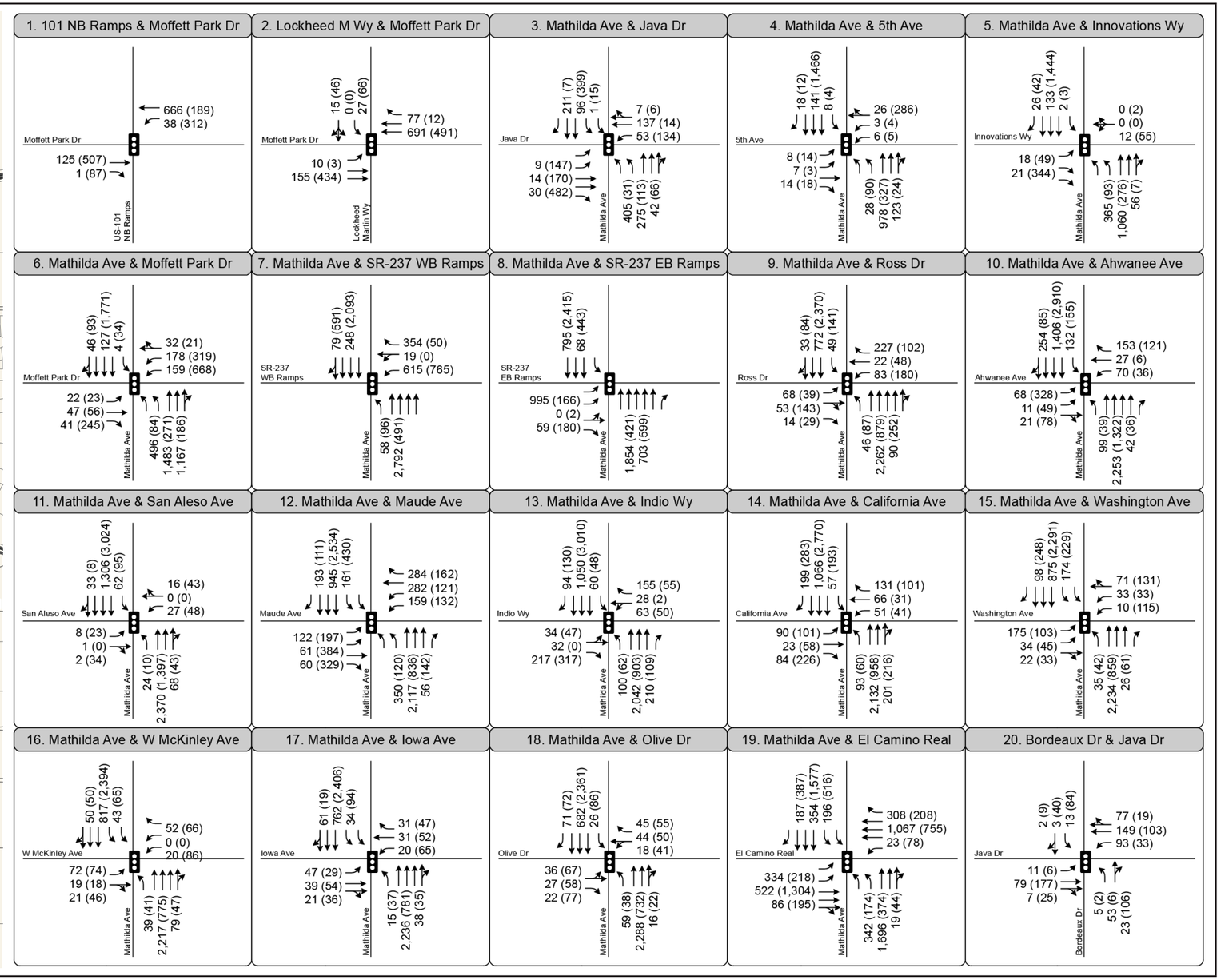
FIGURE 4.6-8

Peak Hour Traffic Volumes and Lane Configurations Existing Conditions

RBF A Baker Company

7/22/13 JN 133847-19136 MAS



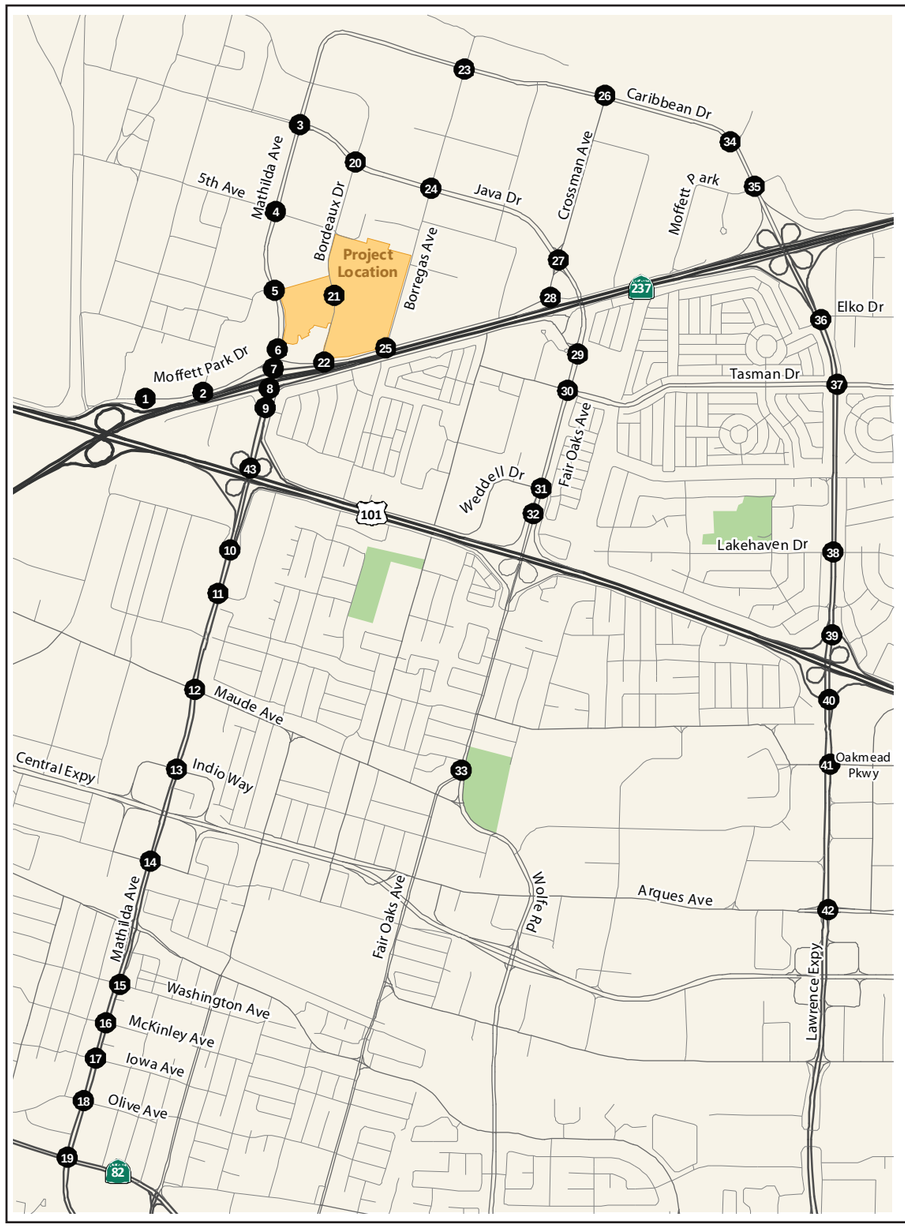


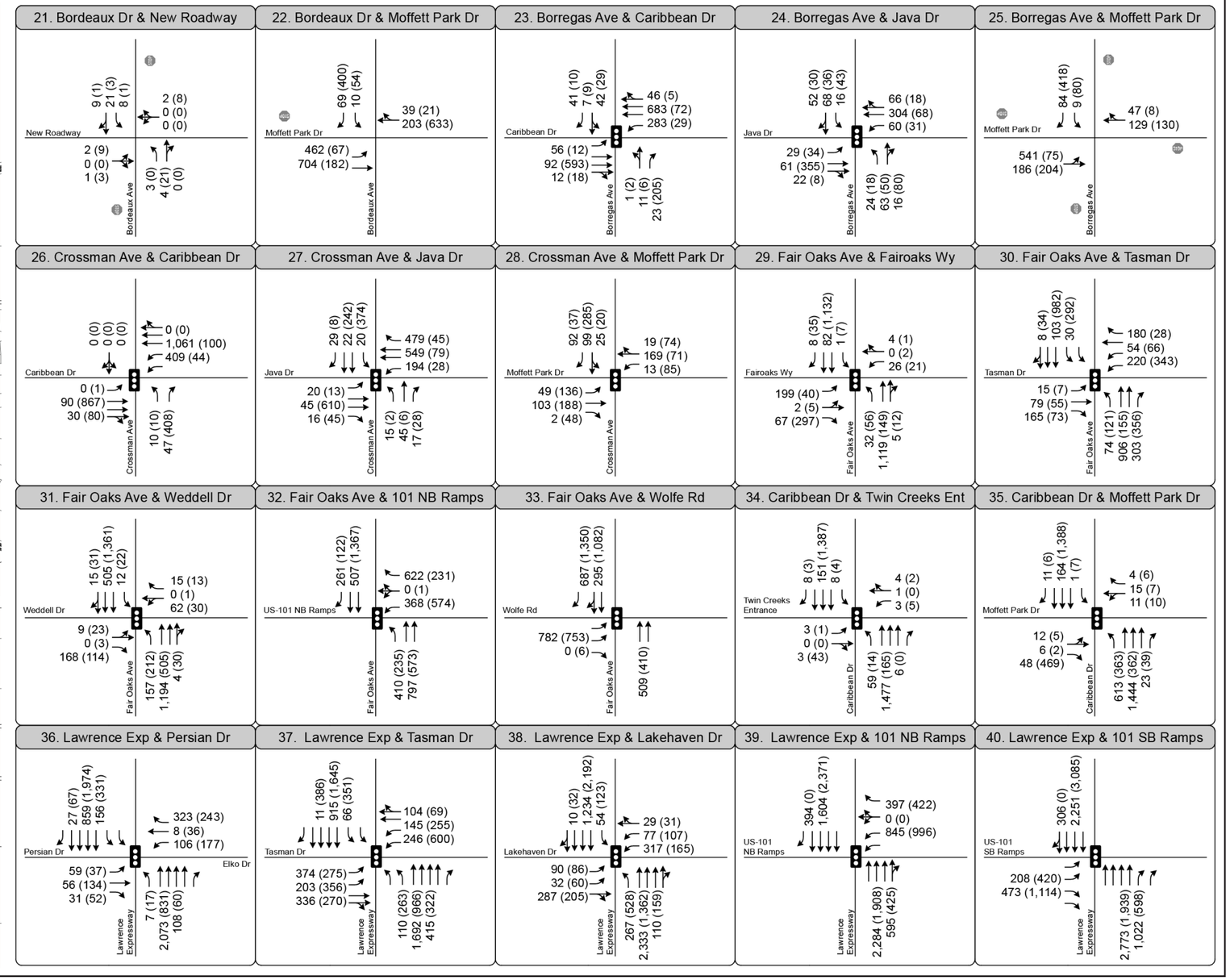
Source: Fehr & Peers, July 2013.

Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-9

Peak Hour Traffic Volumes and Lane Configurations Existing plus Project Conditions



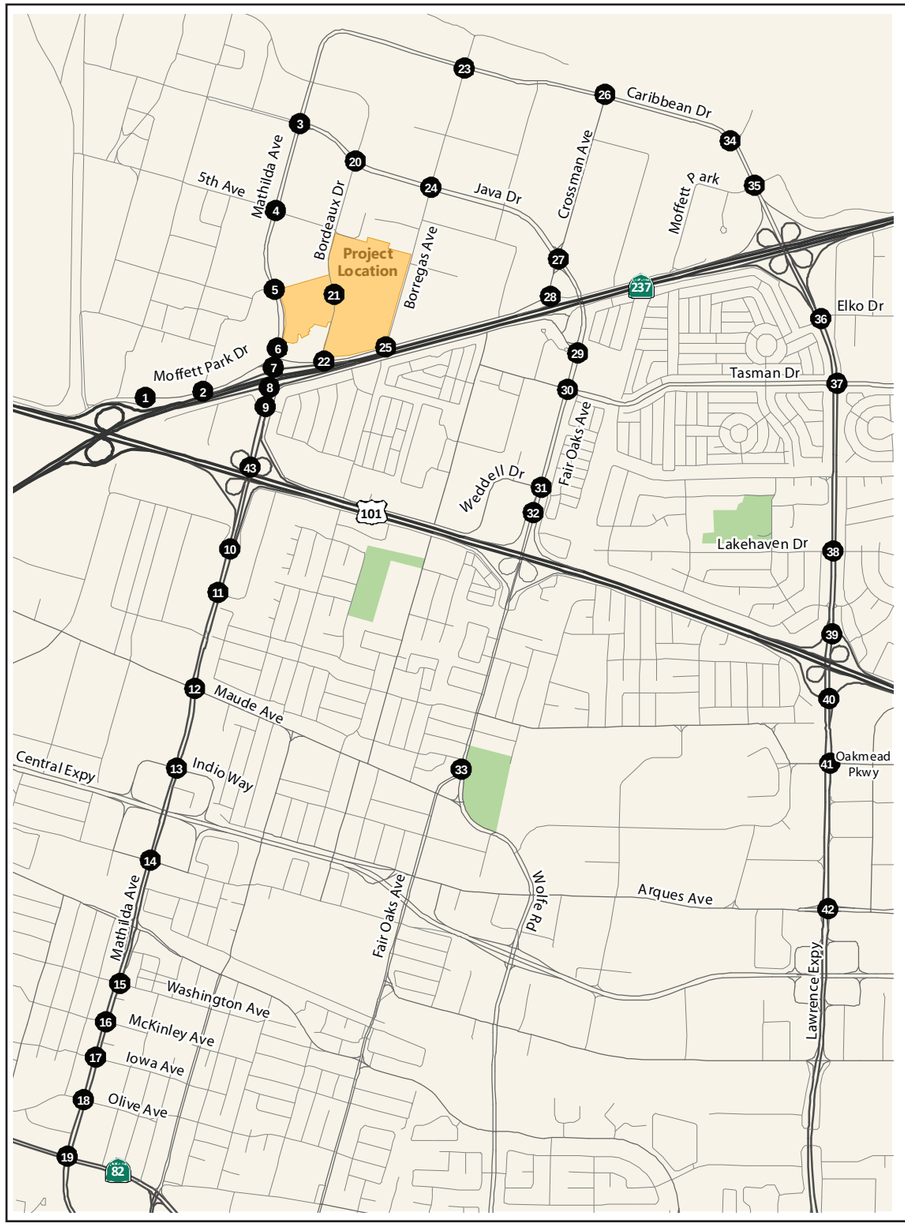


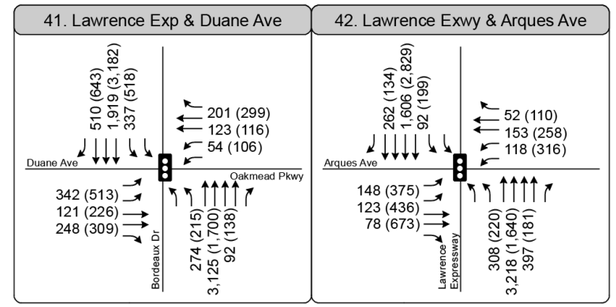
Source: Fehr & Peers, July 2013.

Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-10

Peak Hour Traffic Volumes and Lane Configurations Existing plus Project Conditions





Source: Fehr & Peers, July 2013.

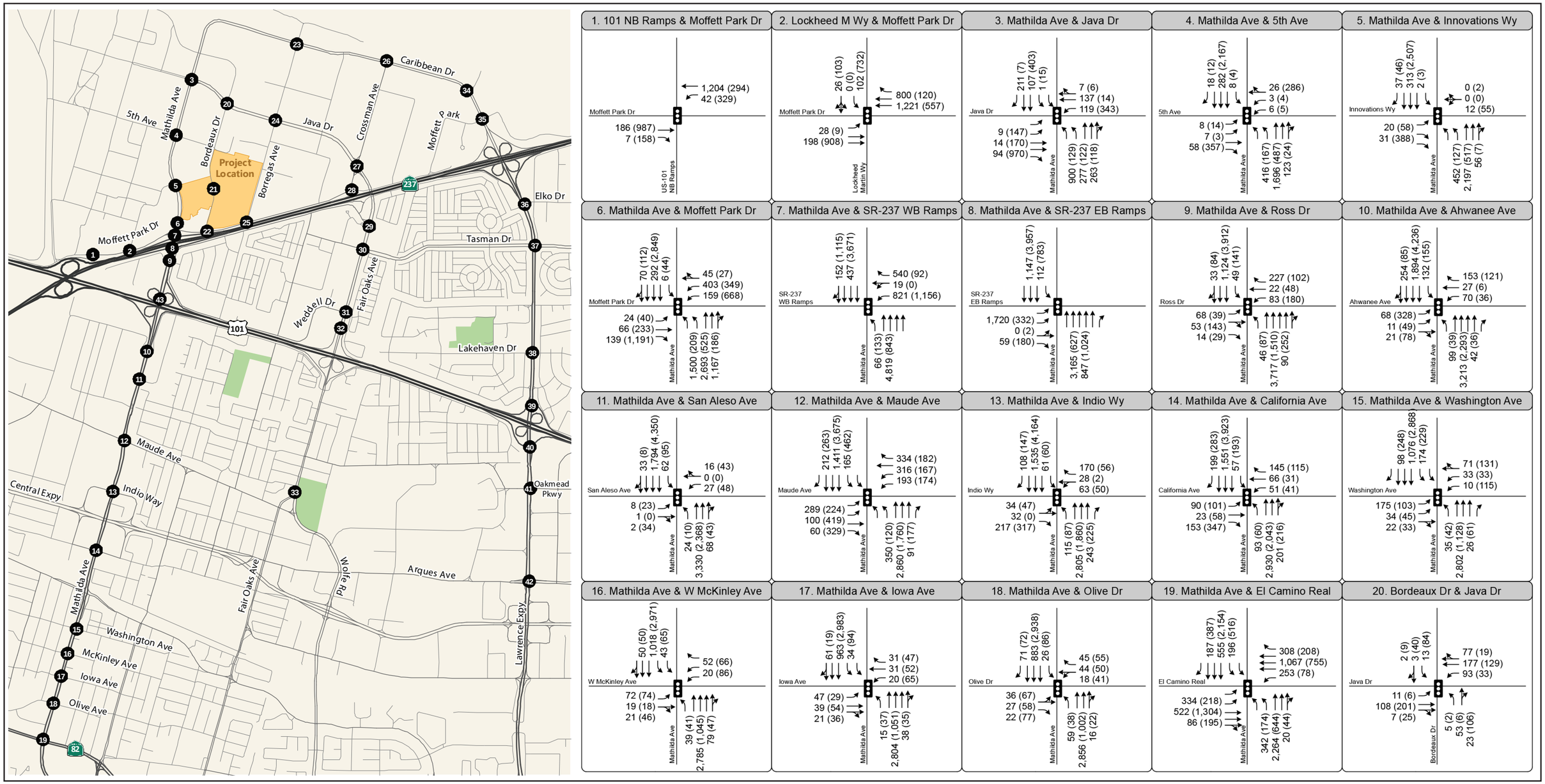
Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-11

Peak Hour Traffic Volumes and Lane Configurations Existing plus Project Conditions

RBF A Baker Company

8/27/13 JN 133847-19136 MAS



Source: Fehr & Peers, July 2013.

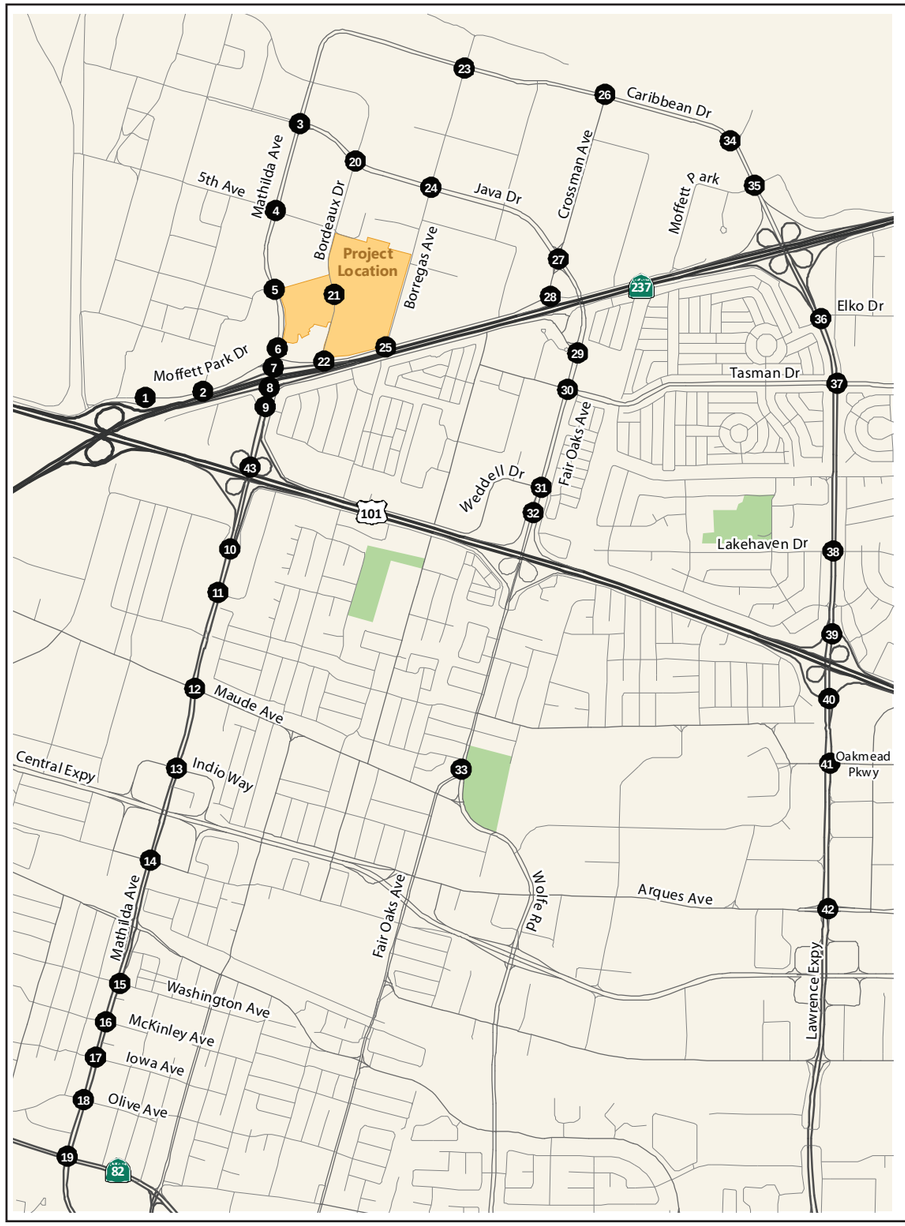
Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

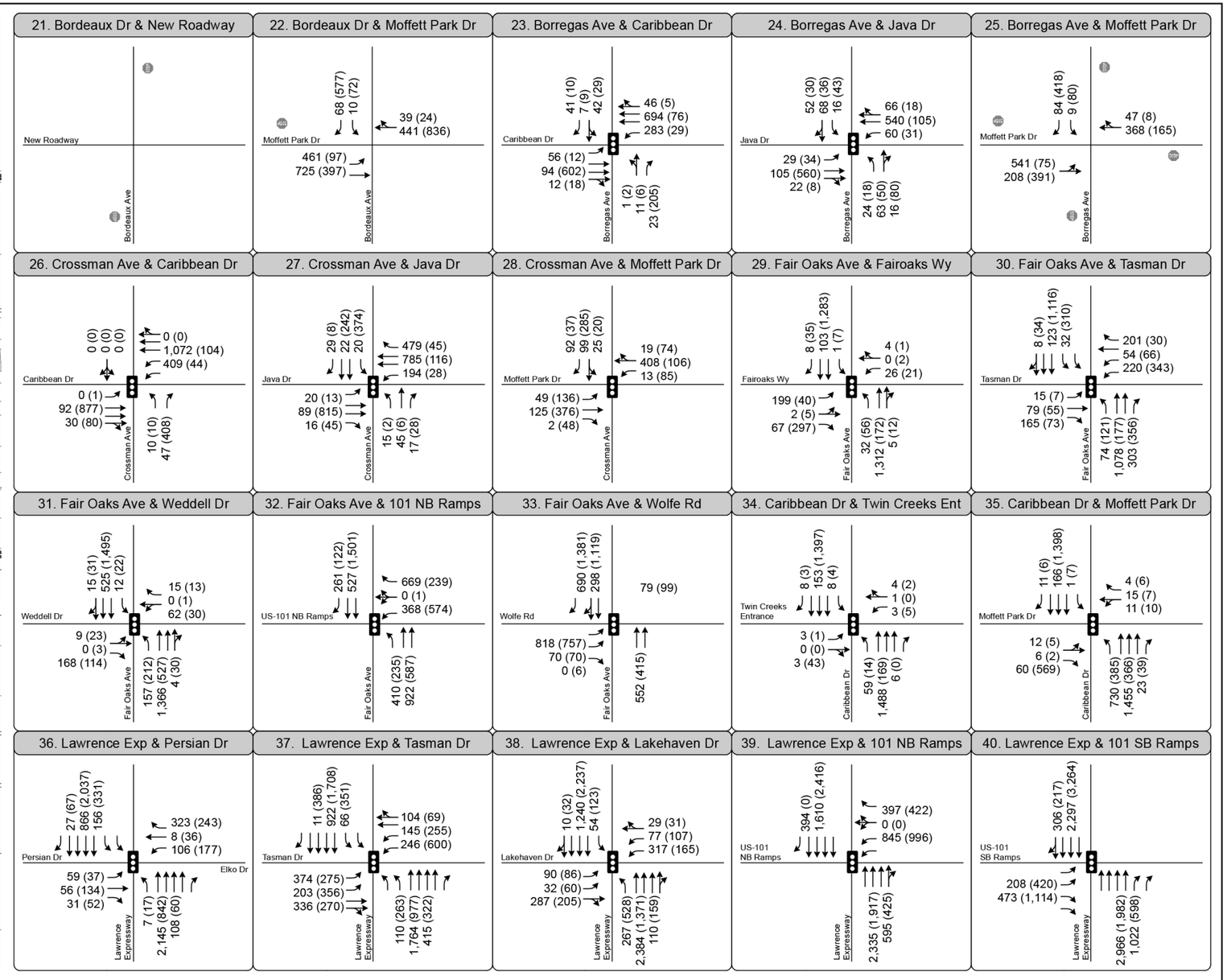
FIGURE 4.6-12

Peak Hour Traffic Volumes and Lane Configurations Background plus Project Conditions

RBF A Baker Company

8/27/13 JN 133847-19136 MAS





Source: Fehr & Peers, July 2013.

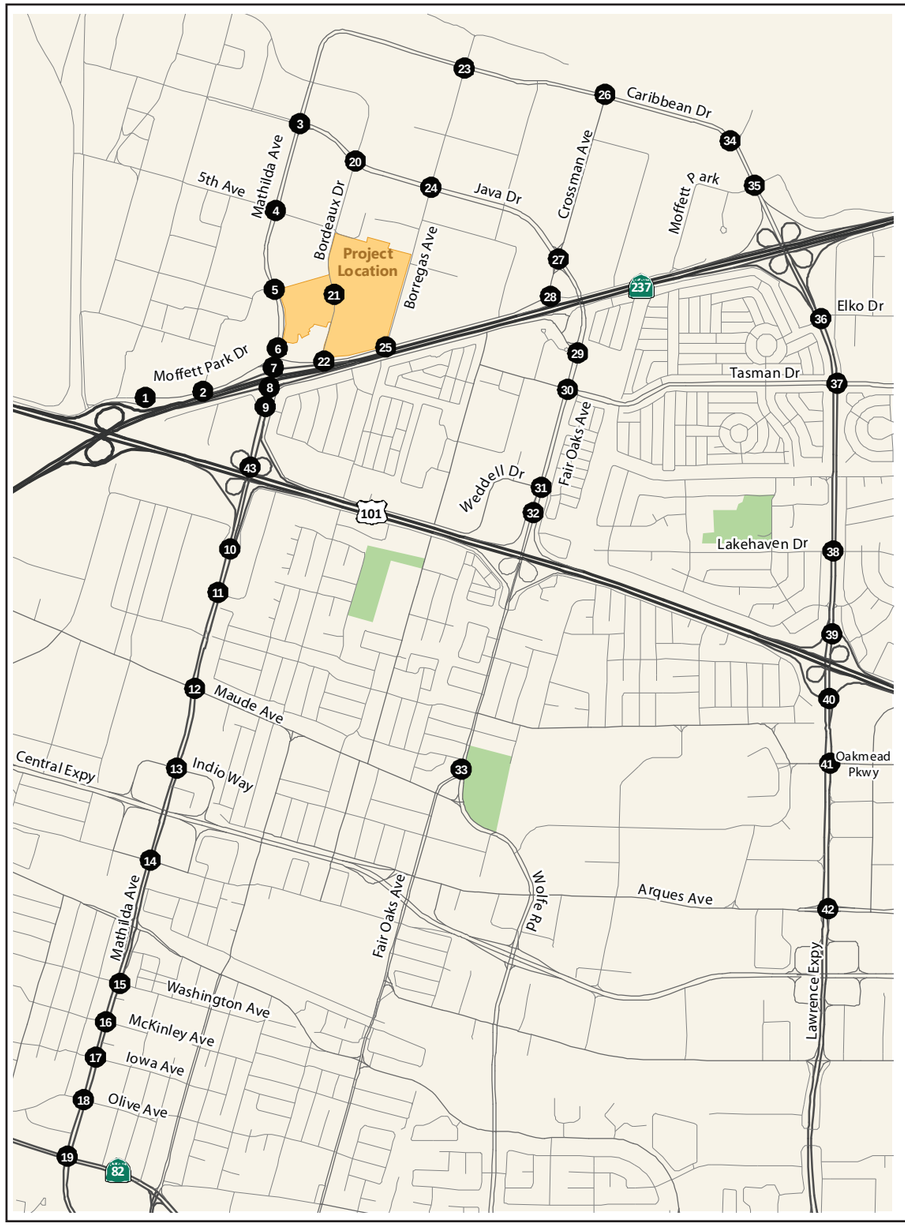
Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

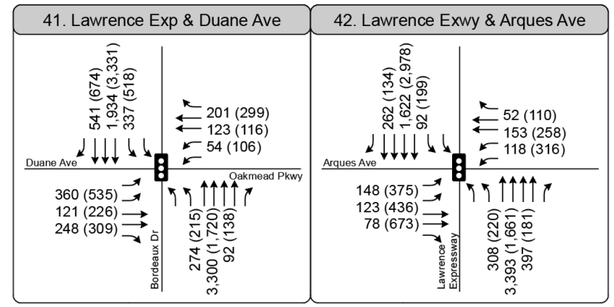
FIGURE 4.6-13

Peak Hour Traffic Volumes and Lane Configurations Background plus Project Conditions

RBF A Baker Company

8/27/13 JN 133847-19136 MAS





Source: Fehr & Peers, July 2013.

Turn Lane
AM (PM) Peak Hour Traffic Volume
Study Intersection
Traffic Signal
Stop Sign

FIGURE 4.6-14

Peak Hour Traffic Volumes and Lane Configurations Background plus Project Conditions