16. TRANSPORTATION AND CIRCULATION

This chapter describes: (1) the existing and planned transportation and circulation system in the project vicinity, including roadway, bicycle, pedestrian, parking, and transit provisions; (2) the potential impacts of the project on those provisions; and (3) associated mitigation measures for identified significant impacts. The findings in this chapter are based on research, review of other relevant studies and independent analysis undertaken by Fehr & Peers, transportation consultants.

16.1 SETTING

16.1.1 Roadway System

(a) Key Roadway Links. Figure 16.1 illustrates the existing local and regional roadway system serving the project vicinity, which is comprised of freeways, arterials, collectors, and local streets. A brief description of these key roadway system components as of release of the NOP for this Draft EIR is provided below.

Interstate 80 (I-80) is an east-west freeway which runs generally north-south through Hercules, with three travel lanes plus one HOV lane in each direction south of the I-80/SR 4 interchange, and three mixed-flow travel lanes and no HOV lane north of the I-80/SR 4 interchange. Caltrans plans to begin construction of HOV lanes north of the I-80/SR 4 interchange in 2010. I-80 currently carries an average daily traffic (ADT) volume of approximately 180,000 vehicles south of the I-80/SR 4 interchange and 137,000 vehicles north of the I-80/SR 4 interchange. These segments of the freeway currently have a posted speed limit of 65 miles per hour (mph).

State Route 4 (SR 4) is an east-west freeway generally with two travel lanes in each direction east of I-80. West of I-80, SR 4 terminates and becomes John Muir Parkway at San Pablo Avenue. SR 4 currently carries an ADT volume of approximately 40,000 vehicles and has a posted speed limit of 65 mph.

The ***I-80/SR 4*** interchange provides full access between I-80 and SR 4 except for the westbound I-80 to eastbound SR 4 and eastbound I-80 to westbound SR 4/John Muir Parkway connections. One-lane flyover connections are provided for transition between westbound SR 4 and westbound I-80 and between eastbound SR 4 and eastbound I-80.

The ***I-80/SR 4 Connector/Willow Avenue*** interchange is a component of the I-80/SR 4 interchange providing a hook ("loop") on- and off-ramp connection to Willow Avenue from the two-lane ramp connecting eastbound I-80 and eastbound SR 4. East of the Willow Avenue off-ramp, the two-lane connector ramp meets a one-lane section of eastbound SR 4 to form a 3-lane eastbound SR 4 segment. The Willow Avenue hook off-ramp diverges from the two-lane ramp to connect with Willow Avenue. A hook on-ramp allowing access from Willow Avenue to SR 4 eastbound meets Willow Avenue at the same all-way-stop-controlled intersection as the

SOURCE: Fehr & Peers

Figure 16.1

EXISTING ROADWAY SYSTEM AND STUDY INTERSECTIONS

hook off-ramp (intersection #6 on Figure 16.1). The Willow Avenue hook ramps are planned for relocation as part of the City of Hercules' New Town Center Project.

Willow Avenue runs from Sycamore Avenue near the I-80/SR 4 interchange (intersection #6 on Figure 16.1) eastward for one mile, where it turns north, passing over SR 4 and continuing on to its intersection with San Pablo Avenue and Parker Avenue west of I-80 (intersection #1 on Figure 16.1), where it terminates. Willow Avenue is a two-lane "route of regional significance"[1] between Sycamore Avenue and the SR 4 Westbound/Willow Avenue interchange. Most intersections along Willow Avenue in the project vicinity are stop-controlled except the Sycamore Avenue/Willow Avenue intersection, which is signalized. A speed limit of 25 miles per hour (mph) is posted along the route. *Note: For study purposes, the Willow Avenue corridor is assumed in this analysis to have a north/south orientation.*

San Pablo Avenue is a four-lane, north-south arterial "route of regional significance" located parallel to and west of I-80. Bicycle lanes are provided on portions of San Pablo Avenue in the project vicinity. Parking is generally prohibited on the Hercules segments of the roadway. The posted speed limit in the study area is 40 mph. Sidewalks are provided around developed areas, and asphalt paths connect some non-developed portions of the roadway to the previous Transit Center location on San Pablo Avenue; the Transit Center was recently relocated to the Willow Avenue corridor.

Sycamore Avenue runs from the project site southeast towards San Pablo Avenue, underneath I-80, and to the east, south of Willow Avenue. Sycamore Avenue is two-lane route between the project site and San Pablo Avenue, a four-lane route between San Pablo Avenue and Palm Avenue, and a two-lane route east of Palm Avenue. Bicycle lanes are provided between San Pablo Avenue and South Front Street. West of South Front Street, on-street parking is provided and the roadway narrows to two travel lanes with no bicycle lanes. The posted speed limit on Sycamore Avenue in the project vicinity is generally 25 mph.

Old Transit Center Road served as the entrance to the previous (now relocated) Transit Center location, off of San Pablo Avenue between John Muir Parkway and Sycamore Avenue. Old Transit Center Road intersected San Pablo Avenue at a signalized intersection, which is now non-functional.

Hercules Avenue is a two-lane road connecting residential development north of San Pablo Avenue to the multi-family residential area south of San Pablo Avenue. Hercules Avenue is a four-lane facility between San Pablo Avenue and Titan Way, and a two-lane facility west of Titan Way, with on-street parking permitted. The posted speed limit is 25 mph.

Linus Pauling Drive is a two-lane road connecting San Pablo Avenue to developed areas to the northwest. Currently, Linus Pauling Drive dead-ends west of Alfred Nobel Drive. The

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[1] As indicated in section 16.2.1(b) of this Draft EIR chapter, the Contra Costa Transportation Authority (CCTA) is the State-designated Congestion Management Agency (CMA) representing jurisdictions in Contra Costa County. The CCTA therefore has CMA authority to designate "routes of regional significance" for which it is responsible for coordinating planning, maintenance and funding. For EIR purposes, CCTA-identified "routes of regional significance" are referred to in this EIR as "CCTA routes" and "CCTA intersections." The West Contra Costa Transportation Advisory Committee (WCCTAC) is responsible for developing operating standards (traffic service objectives) and associated CEQA significance thresholds for CCTA routes and intersections within West Contra Costa County.

Hercules WDMP indicates that the route will connect in the future to John Muir Parkway just east of the project site. On-street parking is permitted on the existing route.

(b) Study Intersections. Intersections, rather than mid-block roadway segments, are almost always the critical capacity-controlling locations for vehicular travel on urban and suburban roadway networks. The following 14 "study intersections" have been selected in consultation with the City staff as those most likely to be affected by the proposed project and therefore warranting study in this EIR:

1. San Pablo Avenue/Willow Avenue,
2. San Pablo Avenue/John Muir Parkway,
3. San Pablo Avenue/Old Transit Center Road (2008 location before relocation of the San Pablo Avenue Transit Center),
4. San Pablo Avenue/Sycamore Avenue,
5. San Pablo Avenue/Hercules Avenue,
6. Willow Avenue/Sycamore Avenue,
7. Willow Avenue/EB SR 4 Ramps,
8. Willow Avenue/WB SR 4 Ramps,
9. I-80 Ramps/Willow Avenue,
10. San Pablo Avenue/Linus Pauling Drive,
11. Sycamore Avenue/Tsushima Street,
12. San Pablo Avenue/Tsushima Street,
13. Sycamore Avenue/Railroad Avenue (With-Project only intersection), and
14. John Muir Parkway extension/Bayfront Boulevard extension (With-Project only intersection).

(c) Study Freeway Facilities: For traffic analysis purposes, freeway facilities are typically divided into basic segments, ramp junctions (merge/diverge influence areas), and weaving sections. Basic segments are mainline sections of the freeway that are not highly influenced by ramp junctions or weaving. Ramp freeway junctions handle traffic entering the freeway from a ramp (merge) or exiting a freeway to a ramp (diverge). Weaving sections handle the crossing of two or more traffic streams on a significant length of freeway. Weaving sections are typically created where a ramp merge area is closely followed by a ramp diverge area, or where an on-ramp is closely followed by an off-ramp and the two are connected by an auxiliary lane.

For purposes of this EIR analysis, freeway facilities (segments, ramp junctions, and weaving sections) potentially affected by the project have been divided into "study sections" based on freeway geometrics and the distance between facilities. The following freeway study sections have been included in this EIR assessment of project-related regional transportation system impacts:

I-80 Freeway Sections:

1. I-80 WB on-ramp from Willow Avenue (merge),
2. I-80 WB off-ramp to John Muir Parkway (diverge),
3. I-80 WB from SR 4 on-ramp to Pinole Valley Road off-ramp (weave),
4. I-80 EB from Pinole Valley Road to EB SR 4 & Willow Avenue (basic),
5. I-80 EB off-ramp to EB SR 4 & Willow Avenue (diverge),
6. I-80 EB on-ramp from SR 4 (merge), and
7. I-80 EB off-ramp to Willow Avenue (diverge).

SR 4 Freeway Sections:

8. SR 4 WB east of Willow Avenue (basic),
9. SR 4 WB off-ramp to Willow Avenue (diverge),
10. SR 4 WB connector to I-80 EB & WB (basic),
11. SR 4 EB on-ramp from Willow Avenue (merge), and
12. SR 4 EB from Willow Avenue to Sycamore Avenue (basic).

For the future Cumulative (2035) traffic analysis scenario addressed later in this chapter, where the eastbound SR 4/Willow Avenue ramps are assumed to be relocated as currently planned, freeway analysis segments 11 and 12 are reclassified in this analysis as:

11. SR 4 EB from I-80 connector to new Willow Avenue off-ramp (weave), and
12. SR 4 EB new on-ramp from Willow Avenue (merge).

16.1.2 Roadway System Analysis Methodology

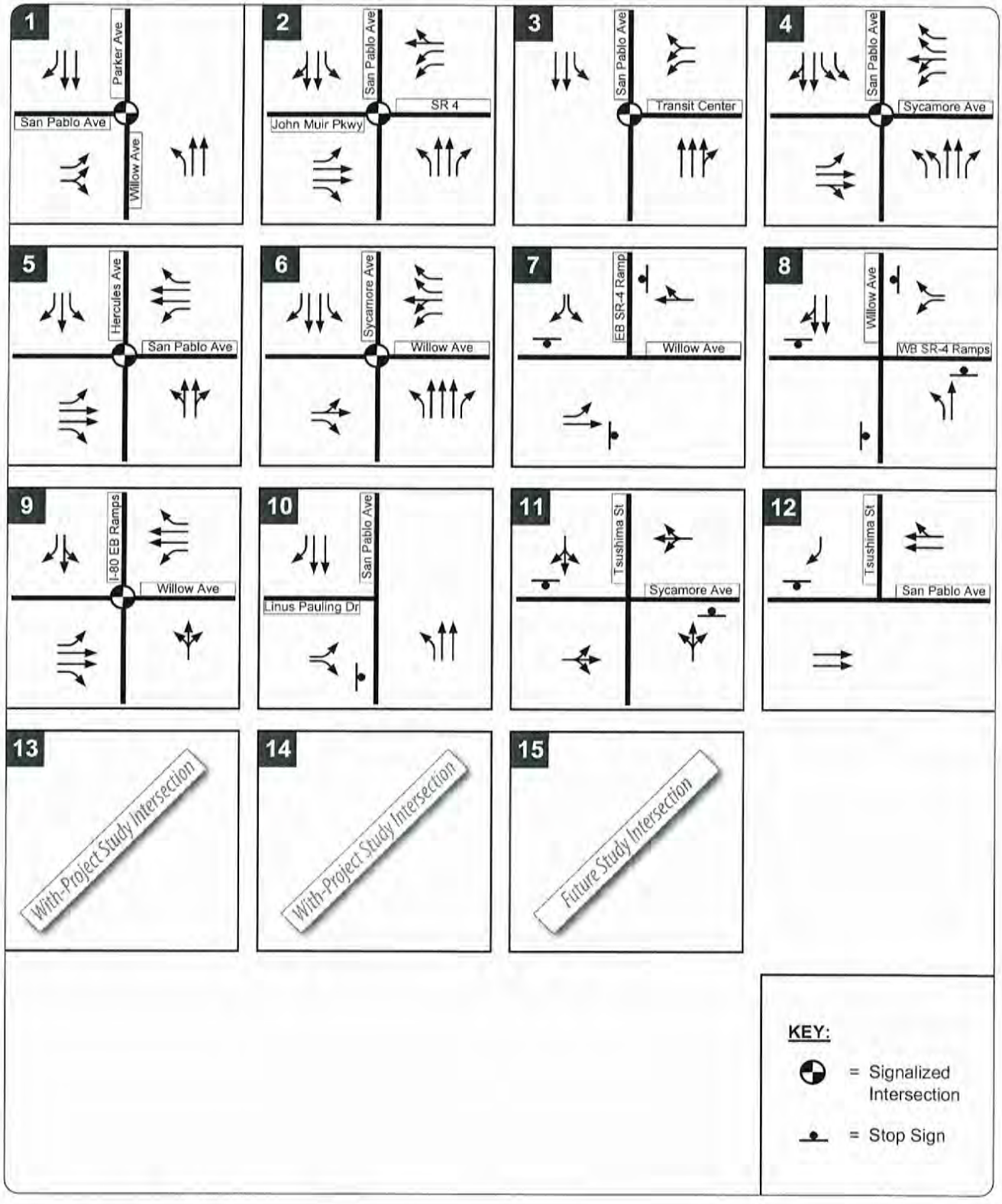
Potential roadway system impacts resulting from the project have been evaluated using methodologies and standards commonly applied by the City in accordance with: (1) normal traffic planning and engineering practice, (2) the guidelines and policies of the Contra Costa Transportation Authority (CCTA), which is the state authorized Congestion Management Agency (CMA) for the County, and (3) the operational standards of the West Contra Costa Transportation Advisory Committee (WCCTAC), which is the regional transportation planning committee responsible for developing and recommending operational standards and CEQA significance thresholds for "routes of regional significance" in West Contra Costa County.[1]

(a) Existing Intersection Facility Traffic Volumes and Analysis Methodology. Existing operational conditions at the 14 study intersections have been evaluated for both the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak hour periods. These morning and evening commute periods typically reflect the highest traffic volume and congestion level periods. Intersection turning movement counts were conducted during these typical weekday periods (Tuesday through Thursday) in November 2008, which is consistent with the release of this EIR's Notice of Preparation (NOP).

During this field reconnaissance, lane configurations, turning movement pocket lengths, speed limits, and signal timings were collected. Existing intersection lane configurations and peak hour volumes are shown on Figures 16.2 and 16.3, respectively. The peak hour volumes presented reflect the peak one hour during the morning peak period and the peak one hour during the evening peak period, when overall traffic levels were highest. Minor adjustments were made to the raw traffic counts in order to ensure balanced volumes between adjacent intersections (i.e., to verify that the traffic leaving one intersection was equal to the traffic entering the adjacent intersection).

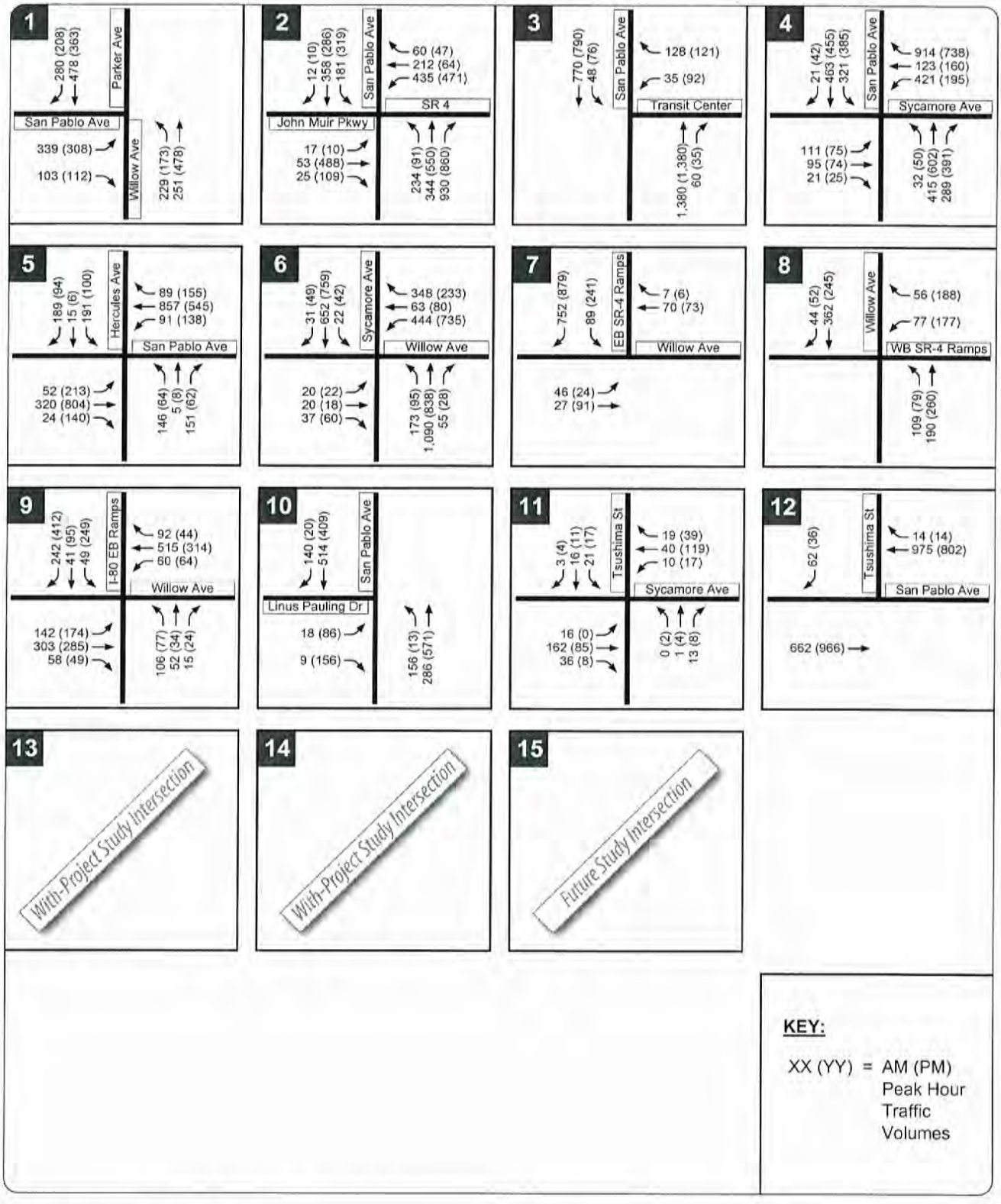
Note: The intersection traffic count summary sheets by the EIR transportation consultant are available for review at the City of Hercules City Clerk, City Hall, 111 Civic Drive, Hercules, CA 94547.

[1] See footnote 1 on page 16-3.



SOURCE: Fehr & Peers

Figure 16.2
EXISTING INTERSECTION LANE CONFIGURATIONS



SOURCE: Fehr & Peers

Figure 16.3

EXISTING AM (PM) PEAK HOUR INTERSECTION VOLUMES

Intersection operations analysis is typically performed using methodologies contained in the *Highway Capacity Manual* (HCM).[1] The HCM provides analysis methods and equations that estimate the average delay experienced by vehicles at signalized and unsignalized intersections. The HCM uses these delay measures to assign a qualitative ***"level of service" (LOS) rating*** for individual intersections to describe overall intersection operating conditions.

The LOS rating system ranges from LOS A, indicating free flow traffic conditions with little or no delay, to LOS F, representing over-saturated conditions where traffic flows exceed design capacity, resulting in excessive queuing and delays. At signalized intersections, the LOS rating is based on the weighted average delay (measured in seconds per vehicle) for all movements. At side-street stop-controlled intersections, the LOS rating is based on the delay for the worst movement at the minor street (controlled) approach. For all-way stop-controlled intersections, the LOS rating is based on the weighted average delay of all movements.

Table 16.1 (Signalized Intersection Level of Service Thresholds) presents the HCM-identified delay thresholds for each LOS classification for signalized intersections. Table 16.2 (Unsignalized Intersection Level of Service Definitions) presents the HCM-identified delay thresholds for unsignalized intersections.

For the study intersections east of the existing eastbound SR 4 ramps at Willow Avenue, HCM-identified intersection analysis methodologies (using Synchro software) were used to analyze traffic operations. For study intersections along San Pablo, Sycamore and Willow Avenues west of the existing SR 4 ramps (#s 1, 2, 3 and 10), which are more closely spaced and part of a coordinated traffic control system where traffic flow and queuing at each intersection influences the entire system, the micro simulation software program SimTraffic was used to determine intersection delay and LOS. The Synchro software and SimTraffic model use identical delay thresholds to determine LOS. The SimTraffic model used for this EIR traffic analysis was originally developed and calibrated for use in the *Hercules New Town Center EIR* which was certified by the City in February 2009.

The primary difference between the Synchro and SimTraffic software is that Synchro analyzes intersections in "isolation," while SimTraffic analyzes intersections as a "system." Synchro software does not account for the effects of congestion at upstream or downstream intersections, turn pocket lengths, or individual driver behavior.

(b) Existing Freeway Facility Traffic Volumes and Analysis Methodology. Existing freeway traffic volume data used for this EIR analysis was obtained from the *Willow Avenue Ramp Relocation Project Study Report* (PSR) which was completed by CCTA in early 2009. The existing condition freeway mainline and ramp volumes in the project vicinity derived from the PSR are presented on Figure 16.4; related high occupancy vehicle (HOV) lane information derived from the PSR is summarized in Table 16.3.

The HCM provides methods for analyzing freeway mainline and ramp junction (merge/diverge influence areas) segment operation by calculating the vehicle density (passenger cars/lane/mile) of the facility. Traffic volumes and roadway geometrics (number of lanes, distance between ramps, etc.) are used as inputs. These density calculations are then compared to HCM-defined thresholds for determining facility operation in terms of levels of service (LOS). Similar to the intersection LOS computation methodologies described above, the

[1]Transportation Research Board (TRB), *Highway Capacity Manual*, 2000.

Table 16.1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

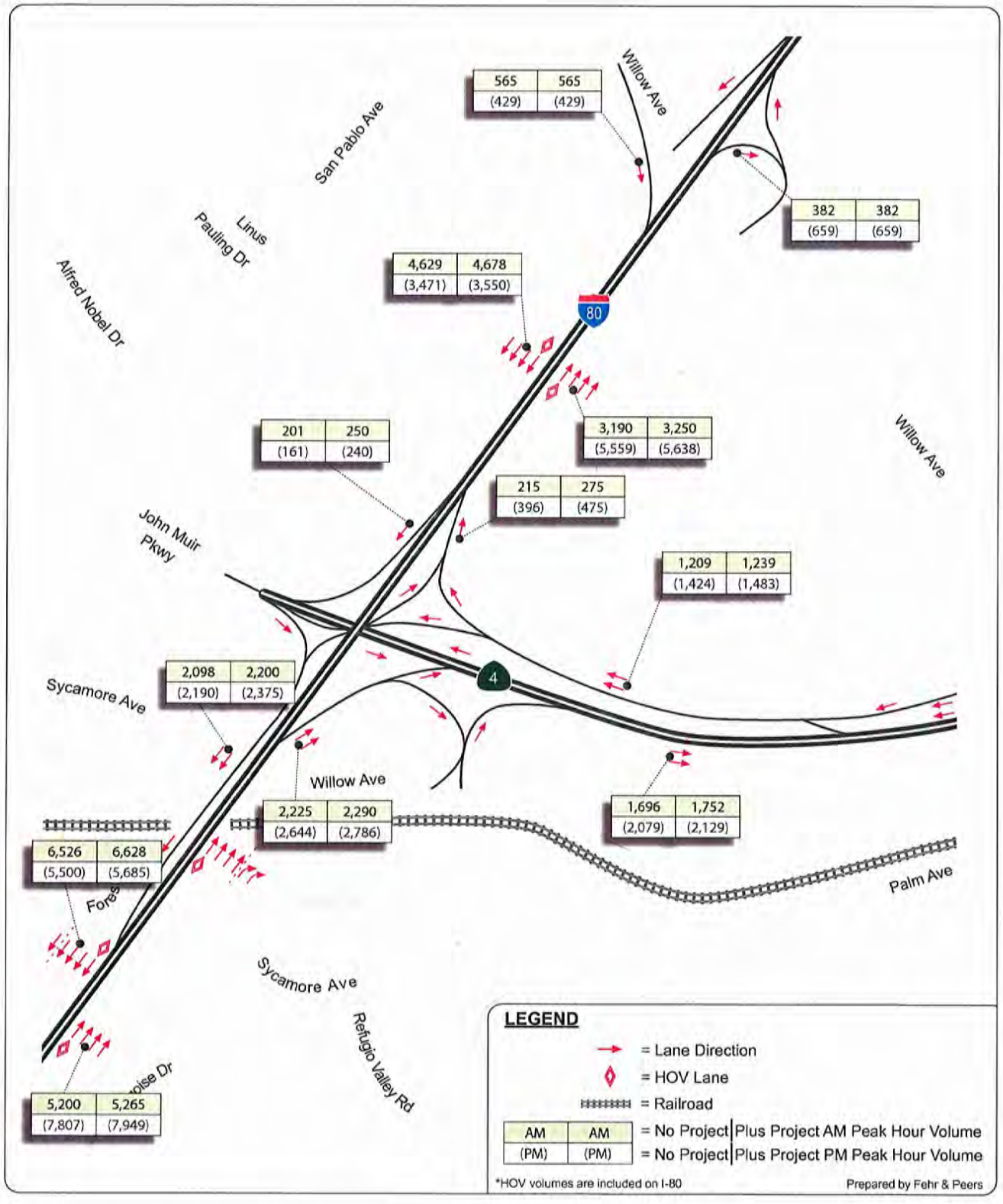
Level of Service	Description of Operations	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
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 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 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: *Highway Capacity Manual*, Chapter 16 – Signalized Intersections, Transportation Research Board, 2000.

Table 16.2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Control Delay Per Vehicle (Seconds)
A	No delay for stop-controlled approaches.	0 – 10
B	Operations with minor delays.	> 10 – 15
C	Operations with moderate delays.	> 15 – 25
D	Operations with some delays.	>25 – 35
E	Operations with high delays, and long queues.	> 35 – 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: *Highway Capacity Manual*, Chapter 17 – Unsignalized Intersections, Transportation Research Board, 2000.



SOURCE: Fehr & Peers

Figure 16.4

EXISTING FREEWAY LANE CONFIGURATIONS AND PEAK-HOUR VOLUMES

Table 16.3
EXISTING HIGH OCCUPANCY VEHICLE INFORMATION

Location	Direction	Percentage of Vehicles in HOV Lane	
		AM Peak Hour	PM Peak Hour
I-80, south of SR 4	Westbound	25%	7%
	Eastbound	4%	13%

SOURCE: Caltrans, 2007 HOV Report and 2002 HOV Report.

Note:

Data was not available for SR 4 in Hercules.

HCM-identified freeway LOS ratings range from LOS A (free-flow conditions) to LOS F (stop-and-go conditions). Table 16.4 (Freeway Mainline and Ramp Junction Level of Service Thresholds) presents the HCM-identified LOS density thresholds for freeway mainline and ramp junction LOS.

Caltrans does not recognize the HCM-based methodologies for freeway weaving sections. For freeway weaving sections, LOS ratings were determined using the "Leisch Method," as recommended by Caltrans in its official *Highway Design Manual.*[1] Inputs to the Leisch Method include the length of the weaving section, the number of lanes, and peak hour volumes. LOS is then determined by plotting these inputs on a graph with a series of curves. Similar to the HCM methods, LOS under the Leisch Method ranges from LOS A to F.

All freeway facility evaluations in this EIR have been limited to the facility's mixed-flow travel lanes and associated traffic volumes only. HOV lanes and associated traffic volumes are ignored because the freeway facility analysis focuses on the merge and diverge points, which involve the intersection of the on-ramps and off-ramps with the outer-most mixed-flow freeway lane. The traffic in the HOV lane (the *inner-most* lane) does not influence the interactions between on- and off-ramp traffic with the outer-most freeway lane.

(c) Freeway and Roadway Traffic Assumptions. The freeway and roadway facility evaluations in this EIR were also based on the following activity assumptions derived from the ITE and Caltrans sources described above:

[1]Caltrans, Figure 504.7A, *Highway Design Manual (HDM), 5th Edition*, 2004.

Table 16.4
FREEWAY MAINLINE AND RAMP JUNCTION LEVEL OF SERVICE THRESHOLDS

Level of Service (LOS)	Freeway Mainline Maximum Density (cars/mile/lane)	Ramp Junction Maximum Density (cars/mile/lane)	General Description
A	11	10	Little to no congestion or delays.
B	18	20	Limited congestion. Short delays.
C	26	28	Some congestion with average delays.
D	35	35	Significant congestion and delays.
E	45	>35	Severe congestion and delays.
F	>45	Demand Exceeds Capacity	Total breakdown with extreme delays.

SOURCE: *Highway Capacity Manual* (2000), Chapters 23 through 25.

- a peak hour truck percentage of five percent and six percent was used for the I-80 and SR 4 mainlines, respectively;
- a peak hour truck percentage of two percent was used for all ramps and local streets;
- a free flow speed of 65 miles per hour (mph) was used for the freeway mainline and 45 mph for the ramps;
- a peak hour factor of 0.95 and 0.94 was used for the mainline and ramp junction AM and PM peak hour analysis, respectively;
- a peak hour factor of 0.95 and 0.94 was used for the local street AM and PM peak hour analysis, respectively;
- the free flow speed assumption for the local streets was based on the posted speed limit;
- the analysis peak hour during the morning peak period was determined to be from 7:30 AM to 8:30 AM; and
- the analysis peak hour during the evening peak period was determined to be from 5:00 PM to 6:00 PM.

16.1.3 Roadway System Analysis Results--Existing Conditions

(a) Intersection Analysis Results. Table 16.5 (Intersection Levels of Service--Existing Conditions) presents the study intersection traffic operations results for existing conditions. Intersection assumptions and peak hour volumes used for the existing operations analysis are presented in Figures 16.2 and 16.3.

(b) Freeway Analysis Results. Table 16.6 (Freeway Facility Levels of Service--Existing Conditions) presents the study freeway section traffic operations results for existing conditions. Freeway section configuration assumptions and peak hour volumes used for the operations analysis are presented in Figure 16.4.

The WCCTAC has identified a minimum acceptable operating level of E for CCTA intersections and freeway roadway segments (i.e., "routes of regional significance"), including West County freeway facilities. As shown in Table 16.6, all of the study freeway facilities are currently operating at LOS E or better during the AM and PM peak hours, except for the I-80 westbound off-ramp diverge to John Muir Parkway, which operates at LOS F during the AM peak hour.

16.1.4 Roadway System Analysis Results--Cumulative Conditions Without Project

(a) Hercules Model. The Hercules Travel Demand Model (Hercules Model) was developed by Fehr & Peers for the City in 2007 and documented in the *Hercules Citywide Traffic Model Development and Validation Report* (Fehr & Peers, October 3, 2007). The Hercules Model is a detailed citywide travel demand forecasting model derived from, and consistent with, the CCTA countywide travel demand forecasting model (Countywide Model). The Hercules Model uses the Countywide Model as a basis for regional trip generation, distribution, and modal split. The Hercules Model also incorporates substantially more detailed land use and roadway network information for the area within the City, and a more detailed trip assignment system based on a "windowed" subarea network. This refined local modeling approach allows the Hercules Model to: (1) reflect changes in wider regional travel demand; and (2) better respond to local changes in land use and roadway network detail.

A draft report detailing the Hercules Model development and the base year assumptions and validations report was delivered to the City, Caltrans, and CCTA in 2007 for review. Comments from these agencies were incorporated into a final version of the report, *Hercules Citywide Traffic Model Development and Validation Report* (Fehr & Peers, October 3, 2007). This report indicated that the Hercules Model meets most Caltrans and CCTA validation criteria, and was approved for use on projects such as the *Willow Avenue Ramp Relocation PSR*. CCTA has also approved the Hercules Model for use on individual development projects within the City through year 2012 (the anticipated time to CCTA's next major Decennial Update of the Countywide Model).

The following subsections (b), (c), and (d) provide an overview of the current Hercules Model land use and roadway network assumptions, and the modeling methodology used to develop associated traffic forecasts for the Cumulative (2035) Without-Project base scenario.

(b) Land Use Assumptions. The final Hercules Model (2007) contains 58 Traffic Analysis Zones (TAZs). The 36 TAZs representing the City in the Countywide Model were disaggregated into 53 TAZs, and five additional zones were added to represent adjacent unincorporated areas between Hercules and the Town of Rodeo. The Hercules Model includes a year 2005 base

Table 16.5
INTERSECTION LEVELS OF SERVICE--EXISTING CONDITIONS

Study Intersection		Control	AM Delay[1]	AM LOS[2]	PM Delay[1]	PM LOS[2]
1	San Pablo/Willow	Signalized	17	B	13	B
2	San Pablo/John Muir	Signalized	30	C	36	D
3	San Pablo/Transit Center Dwy	Signalized	7	A	12	B
4	San Pablo/Sycamore	Signalized	29	C	34	C
5	San Pablo/Hercules	Signalized	17	B	14	B
6	Willow/Sycamore	Signalized	34	C	35	C
7	Willow/Existing SR 4 EB Ramps	All-Way Stop	13	B	17	C
8	Willow/SR 4 WB Ramps	All-Way Stop	10	A	12	B
9	Willow/I-80 EB Ramps	Signalized	19	B	18	B
10	San Pablo/Linus Pauling	Side-Street Stop	2 (EB 22)	A (EB C)	3 (EB 14)	A (EB C)
11	Sycamore/Tsushima	Side-Street Stop	2 (SB 11)	A (SB B)	2 (SB 11)	A (SB B)
12	San Pablo/Tsushima	Side-Street Stop	1 (SB 14)	A (SB B)	1 (SB 12)	A (SB B)

SOURCE: Fehr & Peers (2010).

Notes:
[1] Delay = Seconds of average control delay per vehicle
[2] LOS = Level of Service

Table 16.6
FREEWAY FACILITY LEVELS OF SERVICE--EXISTING CONDITIONS

Freeway Facility	I-80 Facilities	Peak Hour	Density (passenger cars/ lane/mile)/LOS[1]
1 I-80 WB on-ramp from Willow Ave	Merge	AM	32 / D
		PM	24 / C
2 I-80 WB off-ramp to John Muir Pkwy	Diverge	AM	- / F[2]
		PM	34 / D
3 I-80 WB from SR 4 to Pinole Valley Rd	Weave	AM	D
		PM	D
4 I-80 EB from Pinole Valley Road to SR 4	Basic	AM	26 / D
		PM	35 / E
5 I-80 EB off-ramp to EB SR 4 & Willow Ave	Diverge	AM	20 / B
		PM	25 / C
6 I-80 EB on-ramp from SR 4	Merge	AM	21 / C
		PM	31 / D
7 I-80 EB off-ramp to Willow Ave	Diverge	AM	24 / C
		PM	35 / D
	SR 4 Facilities		
8 SR 4 WB east of Willow Ave	Basic	AM	14 / B
		PM	20 / C
9 SR 4 WB off-ramp to Willow Ave	Diverge	AM	20 / B
		PM	26 / C
10 SR 4 WB connector to I-80 EB & WB	Basic	AM	10 / B
		PM	12 / B
11 SR 4 EB on-ramp from Willow Ave	Merge	AM	13 / B
		PM	15 / B
12 SR 4 EB from Willow Ave to Sycamore Ave	Basic	AM	15 / B
		PM	17 / B

SOURCE: Fehr & Peers (2010).

Notes:

[1] Density = passenger cars per lane per mile. LOS = Level of Service.
[2] Demand exceeds capacity for merge and diverge sections.

year and year 2035 future year scenario. For the 58 TAZs within the final model completed in 2007, City staff reviewed and approved 2005 land use data and developed detailed land use projections for the year 2035.

The 2035 land use projections included in the latest Hercules Model run completed for this EIR included all under construction, approved, and pending projects within Hercules at that time as well as a significant amount of anticipated additional development over the next 30 years consistent with the Hercules General Plan. The additional development was derived by City staff and based on the zoning potential documented in the General Plan. This conservative approach was followed to ensure that the model results did not understate potential traffic problems, so that the City could adequately plan for potential future modifications to the roadway system.

Within the 58 TAZs, the model indicated that the residential unit total could increase from 9,480 to 13,784 units, and the jobs total could increase from 3,966 to 8,327 jobs, between 2005 and 2035.

The residential unit and employment land use assumptions in the model were checked to ensure that the model incorporated the level of development contemplated for the Sycamore Crossing (formerly known as Penterra Poe), Hill Town, Hercules New Town Center, and Sycamore North developments, as well as expansion of the North Shore Business Park, including expansion of the BioRad campus, and potential redevelopment of the major shopping centers in the city (such as the Creekside Center).

The 2005-2035 traffic model assumptions also include the Hercules Intermodal Transit Center (ITC) project, proposed adjacent to the Hercules Bayfront Project. The proposed ITC would provide intermodal rail, bus and eventual ferry service, as well as a Bay Trail extension and other infrastructure. The proposed ITC location adjacent to the Hercules Bayfront Project is intended to complement the high-density mixed-use development approach of the project by providing for maximum project-related transit usage and thereby substantially reducing project-related vehicle trips. The ITC project would also generate vehicle trips from outside the immediate area. Both its beneficial and adverse impacts on the surrounding road system have therefore been considered in developing the traffic forecasts. Eventual plans for a ferry terminal co-located with the ITC have also been included in the traffic forecasts.

Table 12.4 in chapter 12 (Land Use and Planning) of this EIR lists the under construction, recently approved, and currently pending development projects in Hercules (as of the release of this EIR's Notice of Preparation in November 2009) that were input to the Cumulative Conditions traffic model.

(c) Roadway Network Assumptions. Similar to the TAZ land use data refinements, additional local roadway network detail was added in the Hercules Model to the Countywide Model assumptions as necessary to adequately reflect existing and anticipated Hercules conditions. Local roadways that were added include Linus Pauling Drive, Turquoise Drive, Lupine Road, and the John Muir Parkway extension. These centroid connectors were added and adjusted to reflect the greater TAZ detail and to ensure a more realistic loading of traffic onto the local roadway network. Additional refinements were also made to the base year network assumptions to more closely reflect the number of lanes and actual roadway alignments. Refer to the *Hercules Citywide Traffic Model Development and Validation Report* (Fehr & Peers,

October 3, 2007) for detail regarding the roadway network in the Hercules Model, available for review at the City of Hercules City Clerk, City Hall, 111 Civic Drive, Hercules, CA 94547.

The base 2035 roadway network in the Hercules Model is consistent with the Countywide Model's 2020 "financially constrained" network. This network includes HOV lanes on I-80, locally planned street projects, and relocation of the eastbound SR 4 ramps to Willow Avenue approximately one half-mile to the east to make a full diamond interchange. The Hercules Model-assumed 2035 intersection lane configurations are shown on Figure 16.5.

Raw travel demand forecasts from the Hercules Model were also adjusted to correct for differences between the base model year (2005) and current year (2010) traffic counts as follows:

Step 1 – The base year (2005) and future year (2035) models were run to provide travel demand output for these two analysis years without the project, including intersection turning movement volumes for all of the study intersections, and link volumes for study freeway segments and ramp facilities. The result is considered the growth in model traffic between the base (2005) and future (2035) years.

Step 2 – Forecasted future volumes were derived using the "difference method." The difference method equation is illustrated below and means that traffic forecasts are obtained by adding the growth in model traffic derived from Step 1 above to the existing traffic count.

Forecast Volume = Base Year Count + (Model Forecast – Model Base Year Volume)

(d) Projected Cumulative (2035) Traffic Without the Project. The resulting Cumulative (2035) Without Project peak-hour traffic volume forecasts are shown on Figure 16.6.

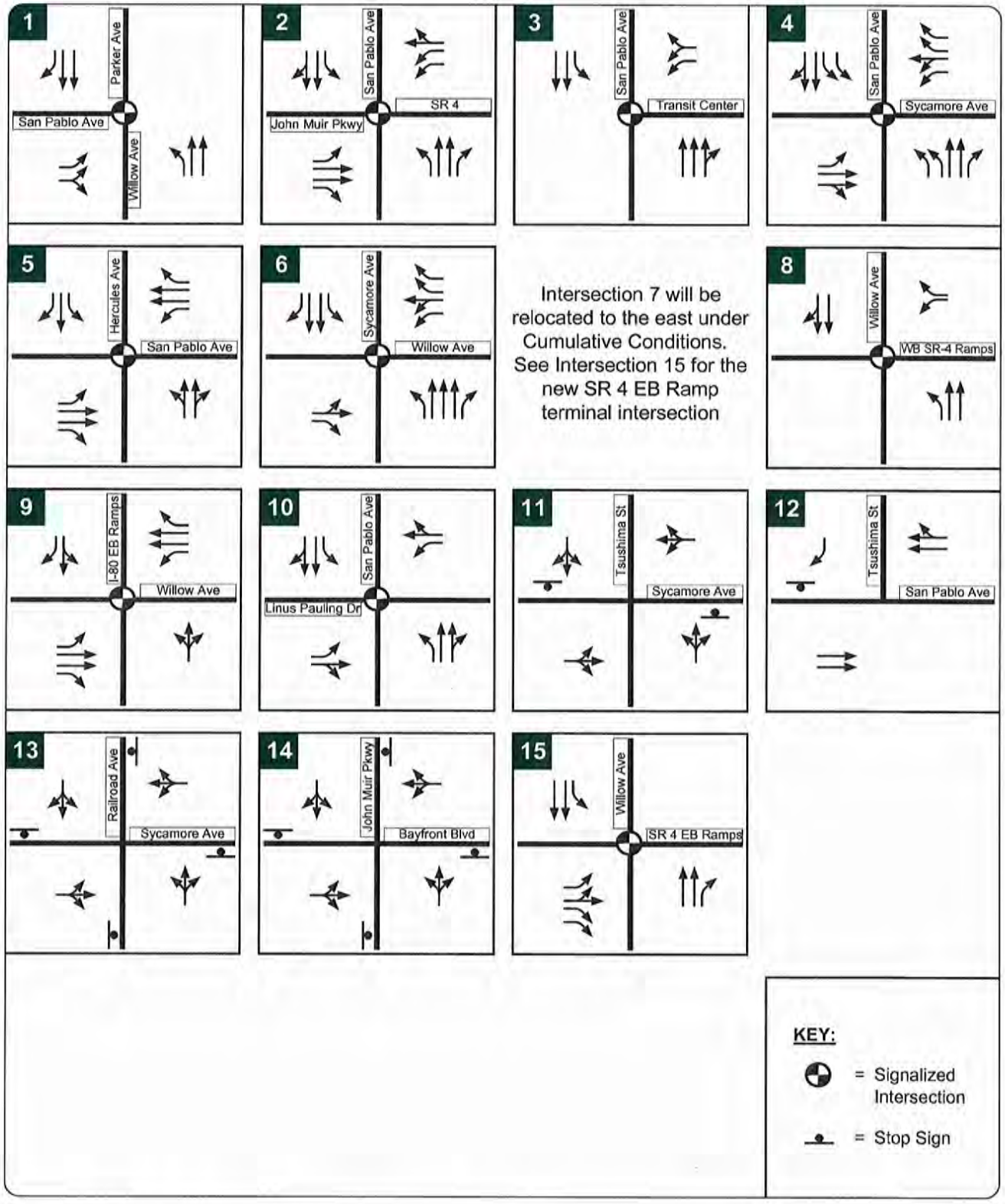
(e) Projected Cumulative (2035) Intersection Operations Without the Project. LOS forecasts were then calculated for all study intersections under the Cumulative (2035) background condition (i.e., assuming the projected background traffic volumes and lane configurations). Table 16.7 presents the LOS results for the Cumulative (2035) Without Project condition.

(f) Projected Cumulative (2035) Freeway Facility Operations Without the Project. Figure 16.7 presents the cumulative freeway volume results, and Table 16.8 presents the cumulative freeway operations results, for the Cumulative (2035) Without Project condition.

16.1.5 Pedestrian and Bicycle Facilities--Existing Conditions

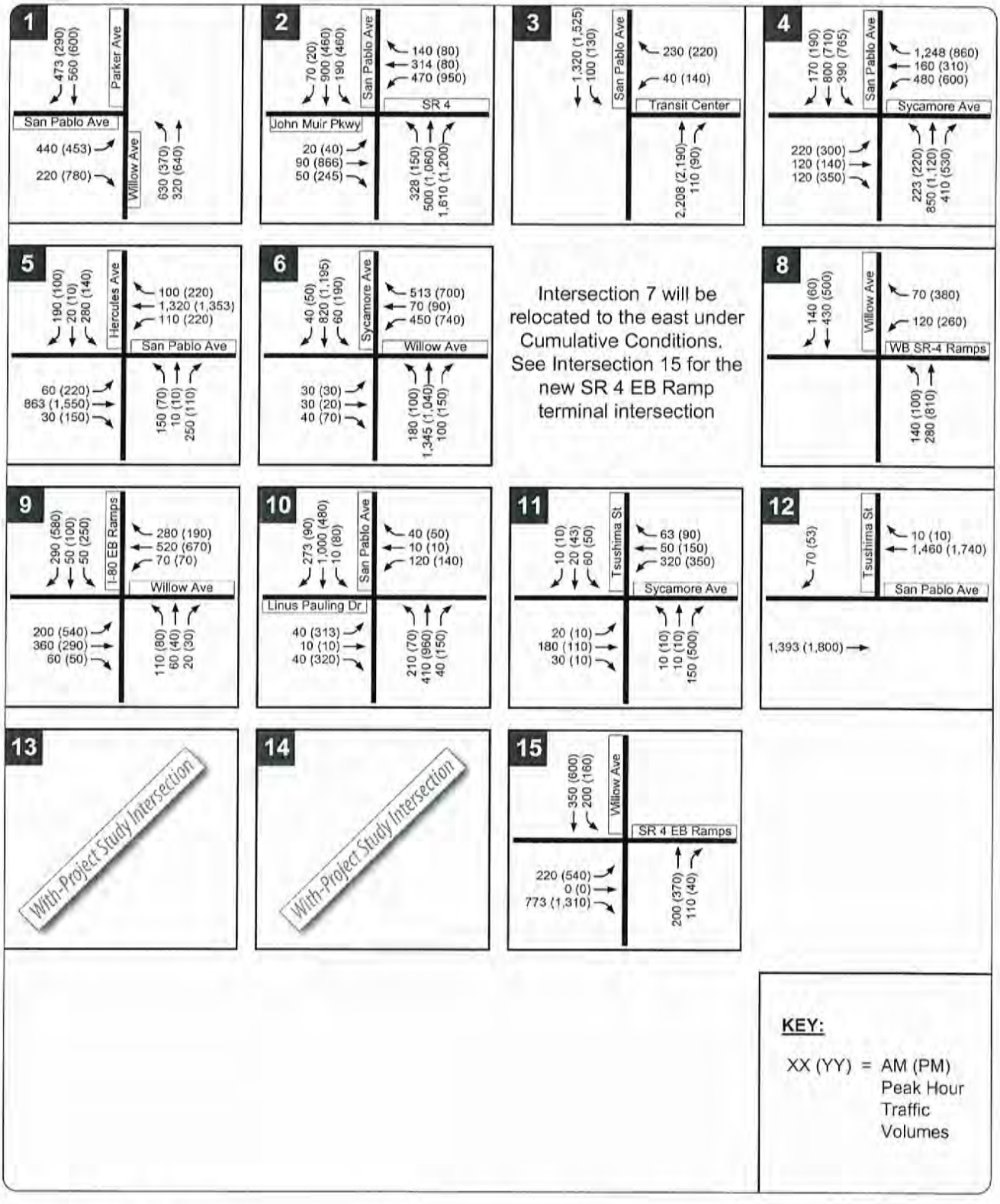
(a) Pedestrian Facilities. The existing pedestrian network in the City consists primarily of sidewalks and multi-use trails. Sidewalks are generally provided in the developed portions of Hercules, including the project vicinity. Other pedestrian facilities in the project vicinity include crosswalks and pedestrian actuated signals at major intersections.

(b) Bicycle Facilities. While there are adopted City plans to expand dedicated bicycle facilities in the project vicinity, no such facilities currently exist, except for bike lanes along portions of San Pablo Avenue and Sycamore Avenue.



SOURCE: Fehr & Peers

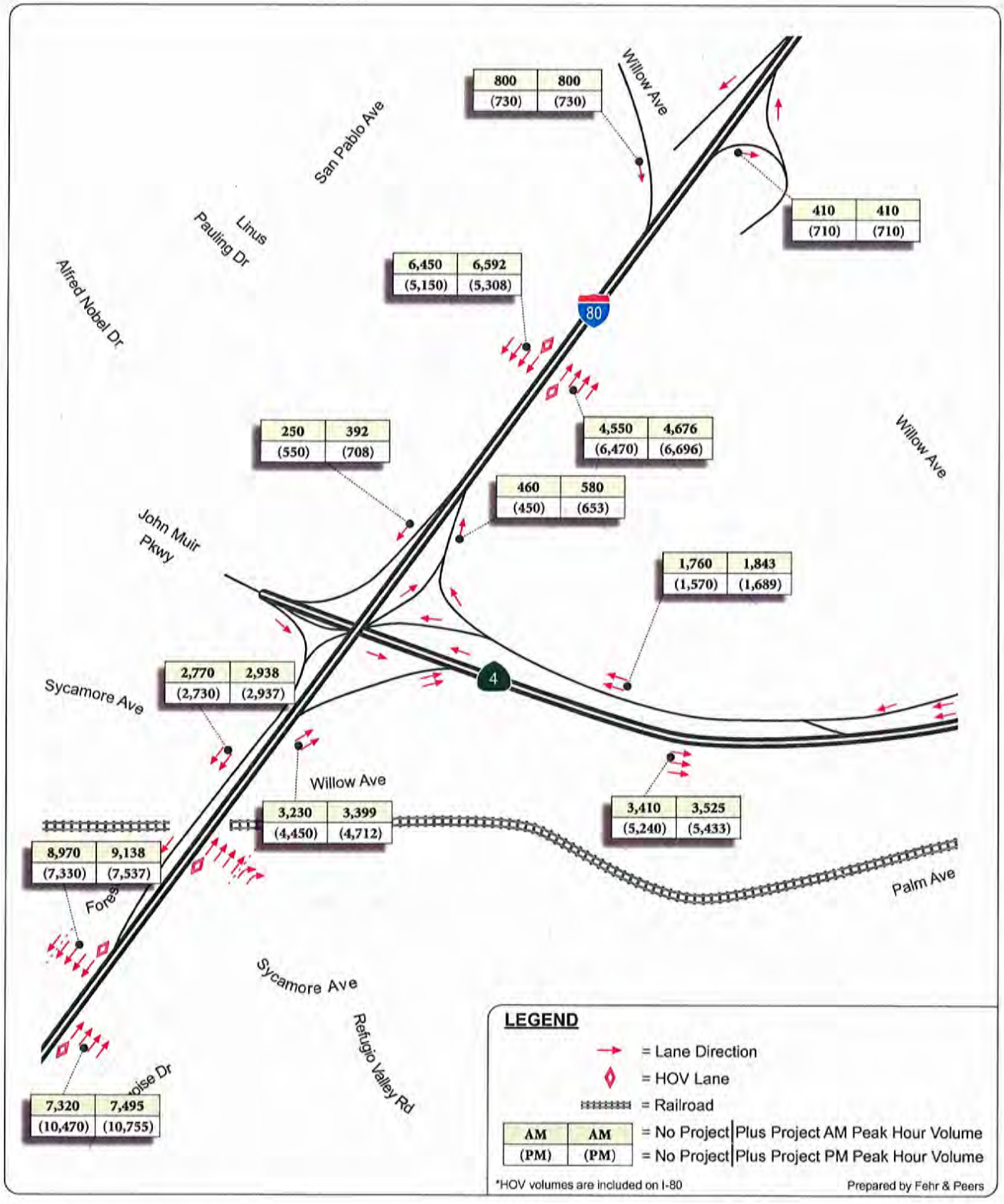
Figure 16.5
CUMULATIVE (2035) INTERSECTION LANE CONFIGURATIONS



SOURCE: Fehr & Peers

Figure 16.6

CUMULATIVE (2035) WITHOUT PROJECT TRAFFIC VOLUMES



SOURCE: Fehr & Peers

Figure 16.7

CUMULATIVE FREEWAY LANE CONFIGURATIONS AND PEAK-HOUR VOLUMES

Table 16.7
CUMULATIVE (2035) WITHOUT PROJECT INTERSECTION OPERATIONS

	Intersection	Control	Cumulative Without Project AM Delay[1]	AM LOS[2]	PM Delay[1]	PM LOS[2]
1	San Pablo/Willow	Signalized	49	D	46	D
2	San Pablo/John Muir	Signalized	62	E	634	F
3	San Pablo/Transit Center Dwy[3]	Signalized	44	D	176	F
4	San Pablo/Sycamore	Signalized	242	F	406	F
5	San Pablo/Hercules	Signalized	36	D	28	C
6	Willow/Sycamore	Signalized	299	F	803	F
7	*Willow/Existing SR 4 EB Ramps*	*This intersection does not exist under Cumulative (2035) Conditions*				
8	Willow/SR 4 WB Ramps	Signalized	11	B	17	B
9	Willow/I-80 EB Ramps	Signalized	16	B	46	D
10	San Pablo/Linus Pauling	Signalized	18	B	15	B
11	Sycamore/Tsushima	Side-Street Stop	21 SB >100)	C (SB F)	66 (SB >100)	F (SB F)
12	San Pablo/Tsushima	Side-Street Stop	1 (SB 19)	A (SB C)	1 (SB 21)	A (SB C)
15	Willow/Diamond SR 4 EB Ramps	Signalized	12	B	20	C

SOURCE: Fehr & Peers (2010).

Notes:
[1] Delay = Seconds of average control delay per vehicle
[2] LOS = Level of Service
[3] Under cumulative conditions, this intersection would serve the Hercules New Town Center project rather than the old (no longer operable) transit center (see existing conditions analysis in subsection 16.1.2).

Table 16.8
CUMULATIVE (2035) WITHOUT PROJECT FREEWAY OPERATIONS

Freeway Facility	I-80 Facilities	Peak Hour	Density (passenger cars/ lane/mile)/LOS[1]
1 I-80 WB on-ramp from Willow Ave	Merge	AM	- / **F**[2]
		PM	39 / E
2 I-80 WB off-ramp to John Muir Pkwy	Diverge	AM	- / **F**[2]
		PM	- / **F**[2]
3 I-80 WB from SR 4 to Pinole Valley Rd	Weave	AM	**F**[2]
		PM	**F**[2]
4 I-80 EB from Pinole Valley Road to SR 4	Basic	AM	31 / D
		PM	- / **F**
5 I-80 EB off-ramp to EB SR 4	Diverge	AM	30 / D
		PM	- / **F**[2]
6 I-80 EB on-ramp from SR 4	Merge	AM	25 / C
		PM	37 / E
7 I-80 EB off-ramp to Willow Ave	Diverge	AM	29 / D
		PM	- / **F**
	SR 4 Facilities		
8 SR 4 WB east of Willow Ave	Basic	AM	19 / C
		PM	24 / C
9 SR 4 WB off-ramp to Willow Ave	Diverge	AM	24 / C
		PM	30 / D
10 SR 4 WB connector to I-80 EB & WB	Basic	AM	15 / B
		PM	13 / B
11 SR 4 EB from I-80 EB to Willow Avenue[3]	Weave	AM	C
		PM	E
12 SR 4 EB on-ramp from Willow Avenue	Merge	AM	24 / C
		PM	24 / C

SOURCE: Fehr & Peers (2010).

Notes:

[1] Density = passenger cars per lane per mile. LOS = Level of Service.
[2] Demand exceeds capacity for merge, diverge, or weave sections.
[3] The eastbound Willow Avenue ramps relocation creates a new weaving section between I-80 and the new Willow Avenue eastbound off-ramp.

16.2 PERTINENT PLANS AND POLICIES

CEQA requires an EIR to identify the plan and policy setting within which the project is proposed and discuss any inconsistencies between the proposed project and these applicable plans and policies (CEQA Guidelines section 15125[d]). CEQA also indicates that this plan and policy consistency discussion should be limited to the context of evaluation and review of environmental impacts (CEQA Guidelines section 15124[b]).

16.2.1 Agencies With Jurisdiction Over Transportation in Hercules

The City of Hercules has jurisdiction over all City streets and City-operated traffic signals. Several regional agencies, including the Contra Costa Transportation Authority (CCTA) (the Congestion Management Agency in Contra Costa County), the West Contra Costa Transportation Advisory Committee (WCCTAC), and the Metropolitan Transportation Commission (MTC), coordinate and establish funding priorities for intra-regional transportation improvement programs. Freeways serving Hercules (I-80 and SR 4) and associated local freeway ramps are under the jurisdiction of the State of California Department of Transportation (Caltrans). These agencies and their jurisdictional responsibilities are more specifically described below.

(a) City of Hercules. The City is responsible for planning, constructing, and maintaining local public transportation facilities, including all City streets, City-operated traffic signals, sidewalks, and bicycle facilities. These local services are funded primarily by gas-tax revenue and developer impact fees.

(b) Contra Costa Transportation Authority. The Contra Costa Transportation Authority (CCTA), which is the designated Congestion Management Agency representing jurisdictions in Contra Costa County, has the authority to designate "routes of regional significance" in the county for which the Authority is responsible for coordinating planning, maintenance and funding, and to establish associated operating standards and CEQA-related significance thresholds. For EIR purposes, CCTA-identified "routes of regional significance" are referred to in this report as "CCTA routes" and "CCTA intersections."

(c) West Contra Costa County Transportation Advisory Committee. The West Contra Costa Transportation Advisory Committee (WCCTAC) is responsible for developing operating standards (traffic service objectives) and significance thresholds for CCTA routes and intersections within the West County.

The WCCTAC has prepared and periodically updates an Action Plan for Routes of Regional Significance (the WCCTAC Action Plan), which was last updated in 2008. The Action Plan assesses current transportation issues within the West County and outlines a recommended package of goals, objectives, and actions for addressing those issues. The Action Plan goals include decreasing vehicle congestion, supporting multi-modal projects, maintaining transit quality, improving emergency access to major arteries and freeways and implementing Hercules and Richmond ferries.

(d) Metropolitan Transportation Commission (MTC). The State-authorized Metropolitan Planning Organization (MPO) for the nine-county Bay Area is the Metropolitan Transportation Commission (MTC). MTC is the authorized clearinghouse for State and federal transportation improvement funds. Each county's CMA, including CCTA, forwards a capital improvement

project list to MTC. MTC reviews the lists submitted by all nine Bay Area counties and submits a regional priority list to the California Transportation Commission (CTC) and/or the Federal Highway Administration (FHWA) for selection of projects to receive funding. Funded projects are then included in the Regional Transportation Plan (RTP) prepared by MTC.

(e) California Department of Transportation (Caltrans). Caltrans has authority over the State highway system, including mainline facilities, interchanges, and arterial State routes. Caltrans approves the planning and design of improvements for all State-controlled facilities. Caltrans facilities in the project vicinity include I-80, SR 4, and associated local interchanges and ramps.

(f) 511 Contra Costa Transportation Demand Management Program. 511 Contra Costa is a comprehensive transportation demand management (TDM) program that promotes alternatives to the single occupant vehicle. 511 Contra Costa is sponsored by all 20 jurisdictions in Contra Costa County through four regional transportation planning committees--SWAT (southwest county), TRANSPAC (central county), TRANSPLAN (east county), and WCCTAC (west county). Funding for 511 Contra Costa programs and projects is provided primarily by the Bay Area Air Quality Management District's Transportation Fund for Clean Air, and the ½ cent sales tax approved by voters in the County in 2004 and administered by the Contra Costa Transportation Authority. A portion of the program's Employer Outreach activity is funded by the Metropolitan Transportation Committee's Congestion Mitigation Air Quality funds.

The program operates offices in the cities of Pleasant Hill, San Ramon and San Pablo. The San Pablo office is operated by WCCTAC and covers the cities of El Cerrito, El Sobrante, Hercules, Kensington, Pinole, Richmond, Rodeo, San Pablo, and other unincorporated areas of the West County. Project oversight services provided by the San Pablo office include:

- the Guaranteed Ride Home program,
- an employer network (for employers located in El Cerrito, Pinole, Hercules, Richmond, San Pablo, and unincorporated areas of West County), and
- an I-80 outreach program (includes transit incentives and information distribution).

16.2.2 City of Hercules General Plan

Objectives, policies, and programs from the Hercules General Plan *Circulation Element* that are pertinent to consideration of the proposed project and its potential transportation and circulation impacts are listed below. Where the proposed project is found in this EIR chapter to be potentially inconsistent with one or more of these City-adopted objectives, policies, or programs (e.g., LOS standards), a potentially significant environmental impact and one or more associated mitigations are identified for incorporation into the project to reduce the impact and better implement the General Plan. Otherwise, the proposed project is considered consistent with the objectives, policies, and programs listed below.

Circulation Element:

- *The policy on traffic level of service reflects the "traffic service objectives" set out in the West County Action Plan. The City has adopted a Growth Management Element to comply with Contra Costa County Measure C (1988)* [now Measure J]. *This included*

adoption of level of service standards on "basic routes" depending on the location of the route: CBD (central business district), urban, suburban, semi-rural and rural.

As also noted in the Growth Management Element of the General Plan, the following are the traffic service standards for Basic Routes (Local Streets) in Hercules:

LOS "High" D to "Low" E (maximum v/c ratio is 0.94)
- *Sycamore Avenue (from Bayberry[1] to San Pablo Avenue)*
- *Bayberry (from I-80 ramps to Sycamore)*

LOS "High" D - (maximum v/c ratio is 0.89)
- *Sycamore Avenue (Highway 4 Freeway- Bayberry)*
- *Refugio Valley Road (Sycamore - Redwood/Falcon)*
- *Alfred Nobel Drive*
- *Linus Pauling Drive*
- *James Watson Drive*
- *John Muir Parkway*

LOS "Low" D - (maximum v/c ratio is 0.84)
- *All other Basic Routes (that is, except Routes of Regional Significance)*

Measure [J] calls for "routes of regional significance" to have a separate "traffic service objective" set cooperatively by all the jurisdictions of western Contra Costa County. Routes of regional significance in Hercules are: I-80, Highway 4 Freeway and San Pablo Avenue. The Circulation Draft of the West County Action Plan for Routes of Regional Significance was published on July 29, 1994, and recommends a traffic service objective of LOS E at signalized intersections on San Pablo Avenue.

For health, safety and general welfare, it is the City's policy to provide adequate levels of traffic service throughout the City. Level of Service D or better is the city wide standard for traffic operating conditions during peak hours on residential streets and intersections. Level of Service D for the commercial/industrial development is acceptable under the following conditions:

1) *striving for off-peak uses*
2) *producing Living Wage jobs*
3) *generating City Revenue and/or*
4) *proposing development that is otherwise highly desirable community-wide.*

New development shall be required to pay its fair share of the cost of improving regional routes so that compliance with the service standard specified in the Action Plan is maintained. (Policy 2.a)

- *Neighborhood design should discourage through traffic on local streets.* (Policy 2.b)
- *Residential streets will be designed in relation to the needed capacity and the adjoining housing patterns.* (Policy 2.c)

[1]Bayberry is now Willow Avenue.

- *The City shall actively participate in cooperative efforts to provide effective public transit to the City and adjacent communities, including promoting a commuter rail extension of BART in the City and a train station along San Pablo Bay within the Lower Refugio Valley serving the Capitol Corridor to intercept through travelers on I-80.* (Policy 2.e)

- *The City should promote the establishment of riding and hiking trails throughout the community and coordinate with other agencies planning trail systems in the area and region.* (Policy 2.f)

- *Participation in local and regional Transportation System Management (TSM) programs, such as the City's adopted Transportation Demand Management (TDM) Program, which was developed by the West Contra Costa County Transportation Advisory Committee (WCCTAC) and includes guidelines for trip reduction measures.* (Implementation Measure 6)

- *Establish a traffic mitigation fee to be paid by all remaining development projects to offset the needed improvements outlined in the General Plan Circulation Element Transportation Technical Report.*

  Create a Transportation System Management (TSM) program. (Implementation Measure 7)

- *Establish a traffic mitigation fee to be paid by all remaining development projects to offset the needed improvements outlined in the City-Wide Traffic Study.* (Implementation Measure 8)

- *Support area-wide cooperative efforts to expand public transit service to the City and surrounding areas.* (Implementation Measure 11)

- *Encourage pedestrian and bicycle travel for home-to-work and home-to-local-shopping trips through the provision of pathways and bicycle storage.* (Implementation Measure 12)

- *As part of road construction projects, enforce dust control measures (such as watering graded areas daily) and require that contractors be responsible for the immediate clean-up of any materials spilled on city streets as a result of grading, construction or hauling operations.* (Implementation Measure 13)

Growth Management Element:

- *The LOS standards in this Element will be used to evaluate the traffic impacts of new developments, and no application shall be approved which may cause a violation of these standards unless either:*

  a. Improvements that will mitigate the projected LOS impact are programmed in the City's or Redevelopment Agency's Capital Improvement Program; or,

  b. A Finding of Special Circumstances has been made for the intersection; or,

  c. Improvements will be made by a project sponsor as part of a project. (Implementing Policy 1)

- *The City shall develop and implement a mitigation program to insure that new development pays its fair share of the cost of maintaining adequate operations on the Basic Routes and the Routes of Regional Significance.* (Implementing Policy 2)

- *As mentioned above, a traffic study shall be performed for any proposed project that may generate 100 or more vehicle trips during the morning or afternoon peak hour. This traffic study shall be prepared in compliance with the technical guidelines issued by the Contra Costa Transportation Authority, and shall be funded by the project sponsor under the direction of City staff.* (Implementing Policy 3)

- *Mitigation measures and conditions of project approval may include payment of fees to fund improvements on Basic Routes or Routes of Regional Significance. Fees for improvements to Basic Routes shall be deposited in a separate City Traffic Mitigation Fund. Fees for improvements to a regional route shall be handled in accordance with the Action Plan for the affected regional route.* (Implementing Policy 4)

- *Improvements to Basic Routes shall be programmed through the City's Capital Improvement Program.* (Implementing Policy 5)

- *Improvements to a Route of Regional Significance which are sponsored by the City of Hercules shall also be programmed through the City's Capital Improvement Program.* (Implementing Policy 6)

- *Improvements to a Route of Regional Significance that are not sponsored by the City of Hercules shall be programmed by the sponsoring agency, and may be acknowledged in the City's Capital Improvement Program.* (Implementing Policy 7)

16.3 IMPACTS AND MITIGATION MEASURES

16.3.1 Significance Criteria

(a) CEQA Guidelines. Based on the CEQA Guidelines,[1] the project would have a significant transportation or circulation impact if it would:

(1) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).

(2) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;

(3) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

(4) Result in inadequate emergency access; or

[1]CEQA Guidelines 2010, Appendix G, item XV(a, b, d, e, and g).

(5) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

(b) City Standards and Significance Thresholds for Roadways. The City, in its capacity as CEQA Lead Agency, has the authority to establish operating standards and significance thresholds for local streets that the City maintains and controls. The City of Hercules General Plan *Circulation Element* Policy 2.a (see section 16.2.2, above and subsection [e][1] below) establishes the City's LOS standards for study intersections on locally controlled roadways.

(c) CMA Standards and Significance Thresholds for Roadways. The CCTA, which is the designated Congestion Management Agency (CMA) in Contra Costa County, has the authority to establish operating standards and significance thresholds for "routes of regional significance" that CCTA plans and provides funding for. The CCTA has assigned responsibility for developing operating standards and significance thresholds for facilities within the West County to the WCCTAC. The WCCTAC-identified significance thresholds applicable to this EIR are identified in subsection (e) below.

(d) Standards and Thresholds for Multi-Modal Systems. Service standards and thresholds of significance for multi-modal transportation systems are not clearly established in CEQA or in any adopted City planning documents. The standards and thresholds applied in this EIR for multi-modal systems have been derived from the WCCTAC Action Plan, accepted industry standards and related standards identified in Section 32.300 of the City of Hercules Zoning Ordinance.

(e) Standards and Thresholds Applied in this EIR. The following more detailed criteria from the sources described above have been applied in this EIR to determine whether or not the project results in significant adverse impacts to the transportation system (intersections, freeways, and multi-modal facilities) under the Existing Conditions and Cumulative (2035) Conditions scenarios:

(1) Intersections: For study intersections located along San Pablo Avenue and Willow Avenue (study intersections 1, 2, 3, 4, 5, 6, 10, and 12), which are both WCCTAC-designated "routes of regional significance," WCCTAC has established a minimum acceptable operational standard of LOS E. For the remaining study intersections, the operational standards established in the City's General Plan *Circulation Element* Policy 2.a has established a minimum acceptable operational standard of LOS D or better. Using these LOS standards, a significant impact would occur at a study intersection if:

- the addition of project traffic causes a signalized intersection operating at an acceptable level (LOS D or E or better, depending on location) to degrade to an unacceptable level (LOS E or F, depending on location); or, the project causes an increase in delay at a signalized intersection already operating at an unacceptable level (LOS E or F, depending on location); or

- the addition of project traffic causes an unsignalized intersection operating at an acceptable level (LOS D or E or better, depending on location) to degrade to an unacceptable level (LOS E or F, depending on location); AND the intersection meets the criteria for signalization based on a Caltrans peak hour traffic signal warrant.

(2) Freeway Facilities: The CCTA CMP has established an operational standard of LOS F for I-80 and SR 4 in the vicinity of the project. This LOS F standard recognizes that I-80 already experiences severe peak period congestion, particularly at major regional bottlenecks (e.g., the Carquinez Bridge, the I-80/I-580 distribution structure, the MacArthur Maze, etc.). Because LOS F is the lowest rating on the LOS scale, the following additional conservative standard is also applied:

- a significant impact would occur on a study freeway facility if the addition of project traffic causes one or more trips to be added to a freeway segment that is already operating at LOS F.

(3) Multi-Modal Transportation Systems: The following thresholds of significance have been applied in this EIR for analysis of non-auto travel modes:

i. Transit: A significant transit impact would occur if the project:

- disrupts existing transit services from traffic improvements proposed or resulting from the project;
- interferes with planned transit services or facilities; or
- conflicts or creates inconsistencies with adopted transit system plans, guidelines, policies or standards.

ii. Pedestrians and Bicycles: A significant pedestrian or bicycle impact would occur if the project:

- discourages the use of bicycle or pedestrian facilities;
- results in unsafe conditions for bicyclists or pedestrians; or
- has designs that do not meet industry standards and guidelines.

16.3.2 Project Trip Generation and Distribution

(a) Trip Generation. Project vehicle trip generation characteristics were estimated based on the proposed project land use breakdown description in Table 3.2 (Proposed Hercules Bayfront Project: Maximum Buildout Estimate) in chapter 3 (Project Description) of this EIR, using trip generation rates published by the Institute of Transportation Engineers (ITE),[1] with standard trip generation adjustments (reductions) to account for trip internalization (i.e., those trips that both begin and end within the project site) and trips that would use the adjacent ITC transit facilities rather than driving. The base ITE trip rates are derived from isolated case studies of single-use, low density, suburban-style developments. The ITE recommends applying these rates directly if the project fits the case study land use definitions. However, where the project characteristics, including project location and/or project internal land use relationships, differ from the norm (i.e., the case studies); corresponding trip generation adjustments are justified.

[1] Institute of Transportation Engineers (ITE), *Trip Generation, 7th Edition*, 2003

Mixed-use projects located next to transit opportunities, such as the Hercules Bayfront Project, typically generate fewer auto trips per unit of land use than single-use suburban developments. TODs are developments which are specifically designed to feature higher densities in combination with internal transit facilities and a complementary "mixing" of land use types (e.g., residential units adjacent to retail shopping) that are easily accessible by non-motorized travel modes (e.g., transit, walking, and bicycle). Placing complementary land uses and pedestrian connectivity within a development allows users to satisfy multiple activities in one location. Placing adequate transit connectivity within a development allows users to easily access multiple destinations (employment, shopping, school, medical, etc.) without driving. This combination of characteristics (mixed-use and transit orientation) results in a greater "internalization" of trips within a project site--i.e., more trips that both begin and end within the project site). Higher trip internalization reduces the amount of project-related traffic on external roadways and associated traffic congestion, resource consumption, noise, air quality, and global climate change impacts.

Table 16.9 (ITE Trip Generation Rates) presents ITE average trip rates for the major land use categories included in the Hercules Bayfront project description--i.e., multi-family residential, retail, office, and hotel. Table 16.10 presents the trip generation estimates for the project. Land use totals, daily and peak hour trips, the internalization (i.e. walking trips) and transit adjustments, and the final external trip generation estimates are shown.

Based on the project residential density and mixed-use characteristics, a trip internalization reduction of approximately 14 percent has been applied to the trip generation estimate. The 14 percent is based on ITE methodology for multi-use developments, and represents trips that both start and end within the project boundary. Most internal trips are assumed to be made by foot or bicycle, due to the relatively small project footprint of 40 acres.

In addition, a 10 percent reduction to vehicular trip generation was applied due to the proximity of transit services to the project site. The 10 percent transit service trip reduction rate is considered low; the actual reduction rate is expected to be considerably higher given the highly intermodal nature of the planned ITC (i.e., convenient direct access to the Amtrak Capitol Corridor service, regional and local bus service, and ultimately ferry service, although the as yet un-funded ferry service component has not been included in the reduction factor).

(b) Trip Distribution. Project trip distribution assumptions were developed for this analysis based on output from the Hercules Model and on engineering judgment. Figure 16.8 and Figure 16.9 show the Existing Conditions and Cumulative (2035) Conditions scenario project trip assignments. Approximately 200 two-way peak-hour project trips were assigned to reach San Pablo Avenue through the neighborhood to the south of the project, as not all vehicles to this destination would choose to use John Muir parkway (especially trips with one end in the western portion of the project site). The streets in the neighborhood south of the project site have adequate capacity and width to accommodate the added traffic load. Residents living along these streets would notice an increase in vehicle traffic after the project is completed; but the increment of change would not represent a physical impact to street operating conditions.

16.6.3 Existing Plus Project Roadway System Impacts

Figure 16.10 shows traffic volume forecasts for Existing Plus Project Conditions. Table 16.11 shows the associated intersection levels of service (LOS) computation results under Existing Plus Project Conditions. The Hercules Bayfront Project was evaluated assuming that both the

Table 16.9
ITE TRIP GENERATION EQUATIONS

ITE Code	Land Use Description	Units	Daily Trip Equations[1]	AM Peak Hour Trip Equations[1] Total	PM Peak Hour Trip Equations[1] Total
230	Condo / Townhouse	DU[2]	Ln(T) = 0.87 * Ln(X) + 2.46	Ln(T) = 0.82 * Ln(X) + 0.15	T = 0.34 * X + 35.87
710	Office	Ksf[3]	Ln(T) = 0.77 * Ln(X) + 3.65	Ln(T) = 0.80 * Ln(X) + 1.55	T = 1.12 * X + 78.81
820	Retail	Ksf[3]	Ln(T) = 0.65 * Ln(X) + 5.83	Ln(T) = 0.59 * Ln(X) + 2.32	Ln(T) = 0.67 * Ln(X) + 3.37
310	Hotel	Rooms	T = 8.95 * X -373.16	Ln(T) = 1.24 * Ln(X) - 2.00	T = 0.59 * X

SOURCE: *Trip Generation, 7th Edition*, (2003); Fehr & Peers, (2010).

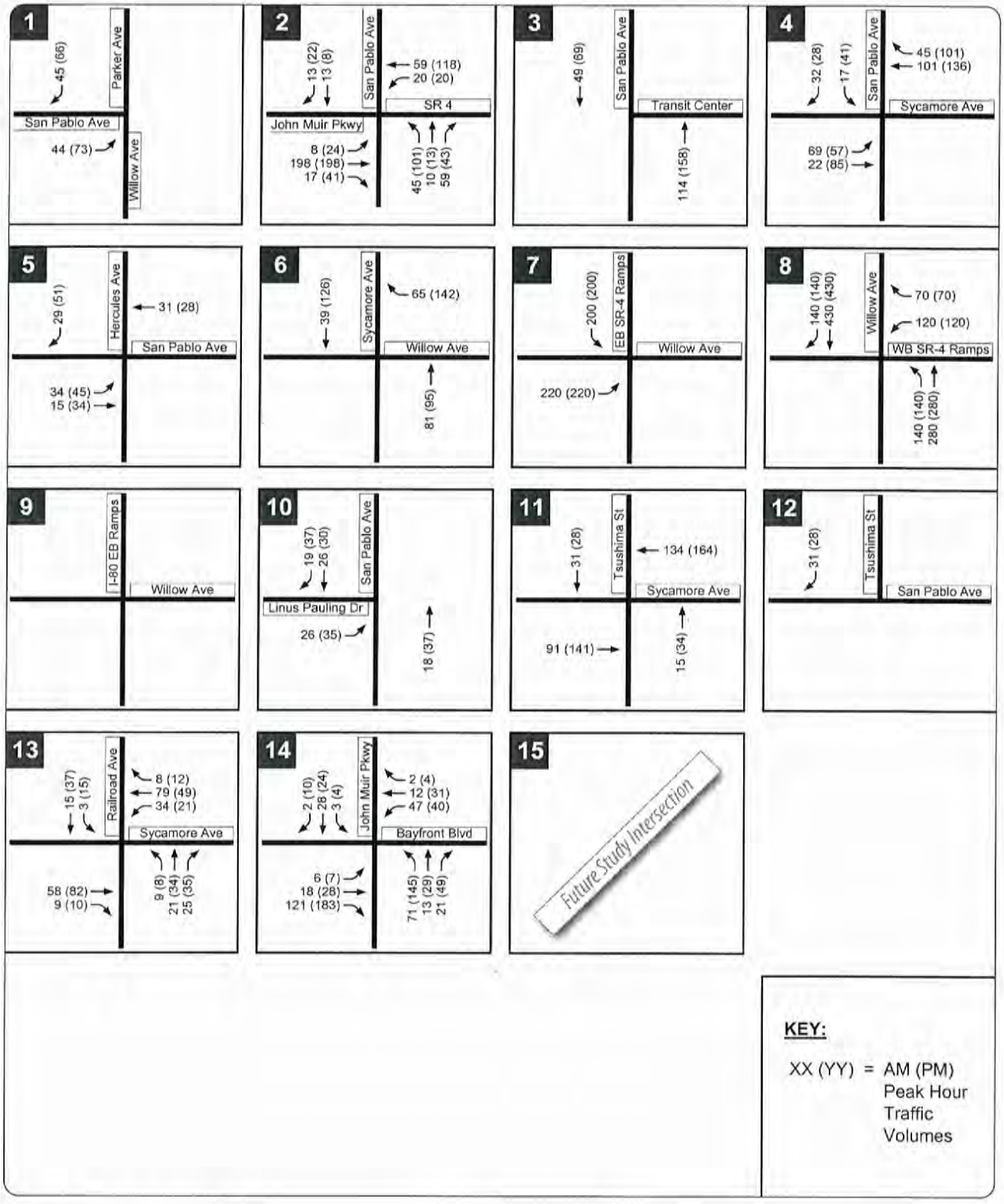
Notes:
[1] T = number of trips, X = number of units, Ln = natural log
[2] DU = dwelling units
[3] ksf = thousand square feet

Table 16.10
PROJECT TRIP GENERATION

Land Use	Units	Quantity	Daily Trips	AM Peak Hour Trips In	AM Peak Hour Trips Out	AM Peak Hour Trips Total	PM Peak Hour Trips In	PM Peak Hour Trips Out	PM Peak Hour Trips Total
Multi-Family	DU[1]	1,267[3]	5,860	65	342	407	299	168	467
Office	ksf[2]	182[4]	2,120	267	36	303	48	235	283
Retail	ksf	157[4]	9,100	123	78	201	422	439	861
Hotel	125	Rooms	750	33	21	54	39	35	74
Sub-Total			**17,830**	488	477	**965**	808	877	**1,685**
Residential Walk/Bike Trips			*-930*	*0*	*0*	*0*	*-57*	*-38*	*-95*
Office Walk/Bike Trips			*-340*	*0*	*0*	*0*	*-13*	*-13*	*-26*
Retail Walk/Bike Trips			*-1,230*	*0*	*0*	*0*	*-46*	*-65*	*-111*
Total Internal Reduction (Walk/Bike Trips)			***-2,500***	*0*	*0*	***0***	*-116*	*-116*	***-232***
Transit Reduction (10% of external trips)			*-670*	*-33*	*-38*	*-71*	*-28*	*-35*	*-63*
Net New External Project Trips			**14,660**	455	439	**894**	664	726	**1,390**

SOURCE: *Trip Generation, 7th Edition*, (2003); Fehr & Peers, (2010).

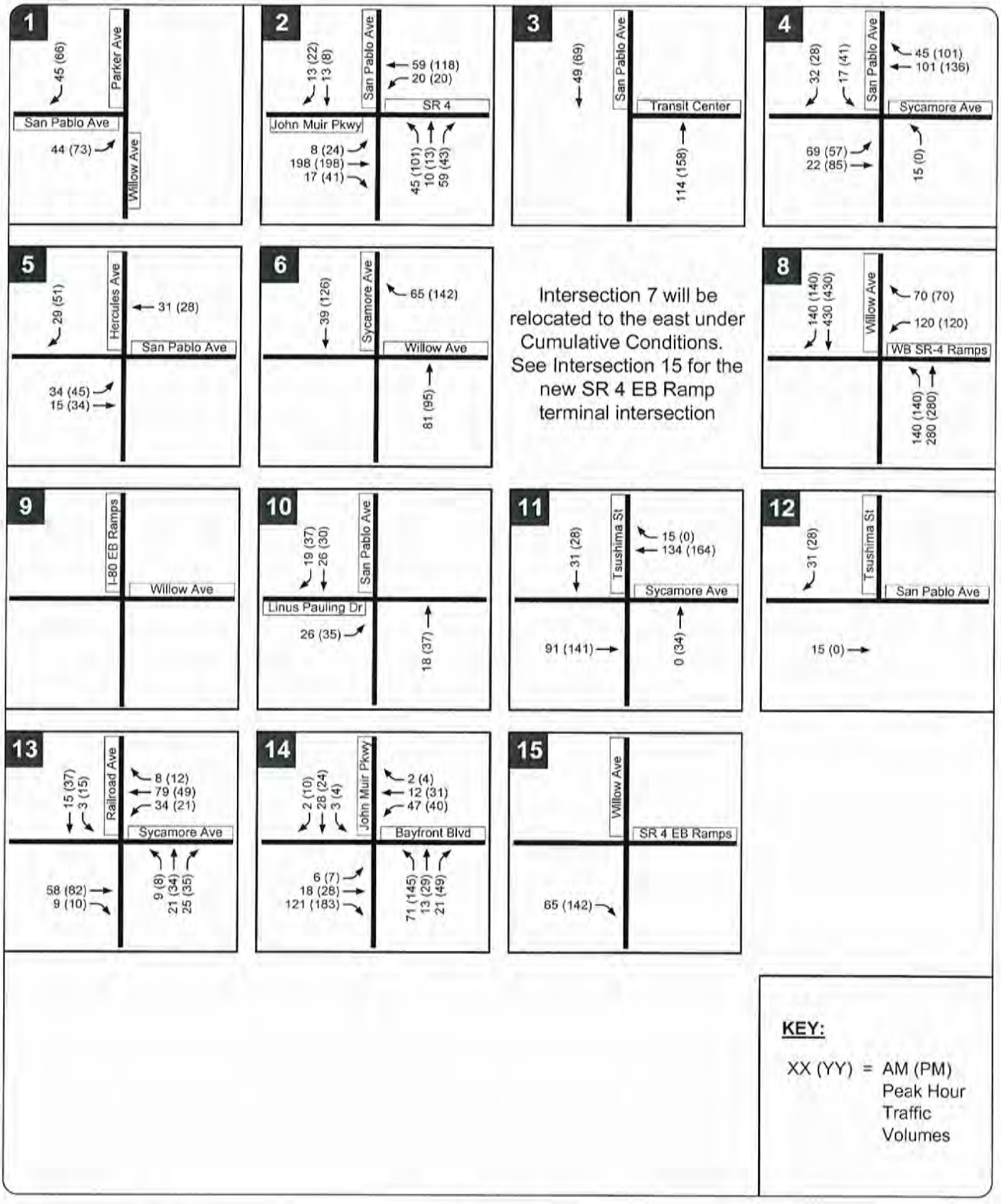
Notes:
[1] DU = dwelling units
[2] ksf = thousand square feet
[3] Table 3.2 in the Project Description chapter of this Draft EIR shows a maximum residential unit (non-flex) total of 1,392. As indicated by footnote 6 at the bottom of Table 3.2 in the Project Description chapter of this EIR, for Block D, the proposed development plan would permit the option of developing 125 multi-family residential (non-flex) units **or** a 125-room hotel. Because a 125-room hotel would have a higher AM/PM peak hour trip generation rate than 125 multi-family residential units, the hotel option is assumed in this trip generation table for Block D; as a result the table indicates a total of 1,267 multi-family residential units (1,392-125=1,267) **and** 125 hotel rooms.
[3] The 134,000 square feet of project "flex space" was analyzed as 50% office use and 50% retail use for trip generation purposes, and is included in the calculations above.



SOURCE: Fehr & Peers

Figure 16.8

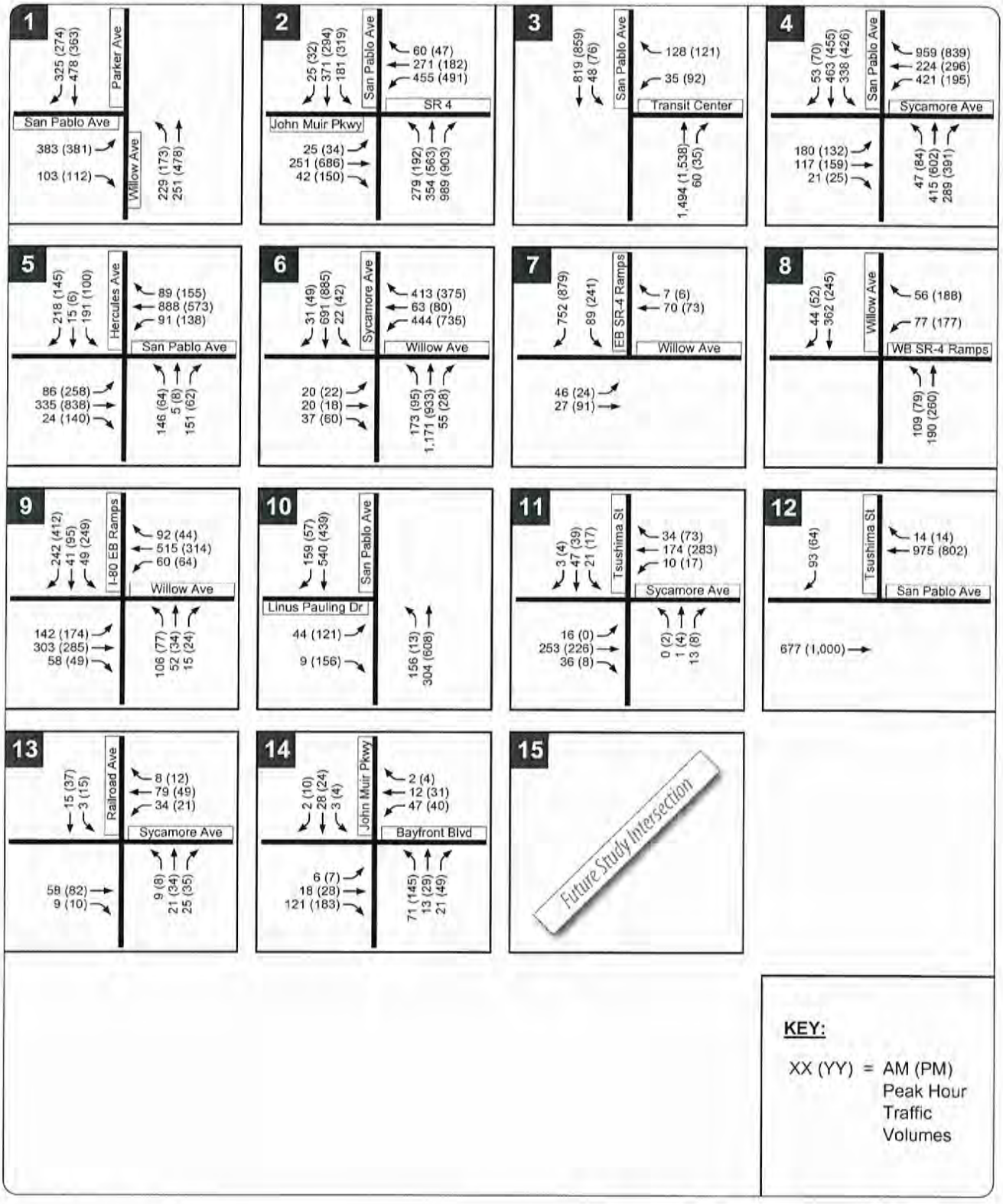
PROJECT TRIP ASSIGNMENT



SOURCE: Fehr & Peers

Figure 16.9

CUMULATIVE (2035) PLUS PROJECT TRIP ASSIGNMENT



SOURCE: Fehr & Peers

Figure 16.10
EXISTING PLUS PROJECT TRAFFIC VOLUMES

Table 16.11
EXISTING PLUS PROJECT INTERSECTION OPERATIONS

Study Intersection		Control	AM		PM	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]
1	San Pablo/Willow	Signalized	14	B	14	B
2	San Pablo/John Muir	Signalized	36	D	52	D
3	San Pablo/Transit Center Dwy	Signalized	8	A	15	B
4	San Pablo/Sycamore	Signalized	32	C	47	D
5	San Pablo/Hercules	Signalized	19	B	14	B
6	Willow/Sycamore	Signalized	52	D	37	D
7	Willow/Diamond SR 4 EB Ramps	Signalized	13	B	17	C
8	Willow/SR 4 WB Ramps	Signalized	10	B	12	B
9	Willow/I-80 EB Ramps	Signalized	19	B	18	B
10	San Pablo/Linus Pauling	Signalized	3 (EB 30)	A (EB D)	3 (EB 17)	A (EB C)
11	Sycamore/Tsushima	Side-Street Stop	3 (SB 14)	A (SB B)	3 (SB 14)	A (SB B)
12	San Pablo/Tsushima	Side-Street Stop	1 (SB 14)	A (SB B)	1 (SB 12)	A (SB B)
13	Sycamore/Railroad	All-Way Stop	8	A	8	A
14	Bayfront/John Muir Parkway	All-Way Stop	8	A	9	A

SOURCE: Fehr & Peers (2010).

Notes:
[1] Delay = Seconds of average control delay per vehicle
[2] LOS = Level of Service

John Muir Parkway extension and Bayfront Boulevard extension were constructed because project uses would require direct access to these two roadways. These two roadways are also being evaluated in the ITC environmental document because both roads are necessary to gain access to the proposed ITC facilities. Identical to the ITC environmental analysis and the Hercules Citywide Travel Demand Model, this EIR assumes that the John Muir Parkway extension would have two travel lanes in each direction and Bayfront Boulevard would have one travel lane in each direction. As discussed in this and subsequent sections of this chapter, these roadway configurations are sufficient to accommodate project and cumulative traffic.

Existing Plus Project Impacts on Intersection Operations. As shown in Table 16.11, all of the 14 "study intersections" evaluated in this EIR traffic analysis would continue to operate within acceptable level of service (LOS) thresholds under Existing Plus Project conditions. The project-generated change to existing intersection LOS conditions would therefore represent a ***less-than-significant impact*** (see criteria [a][1], [a][2], and [e][2] under subsection 16.3.1, "Significance Criteria," above).

Mitigation: No significant intersection operation impact has been identified; no mitigation is required.

Impact 16-1: Existing Plus Project Impacts on Freeway Facilities Operations. As shown in Figure 16.12, the addition of project traffic would exacerbate existing unacceptable (LOS F) traffic operations on one of the 12 "study freeway facilities" evaluated in this EIR analysis, the I-80 Westbound mainline diverge to the John Muir Parkway off-ramp during the AM peak hour. This project effect on existing conditions at this facility would represent a ***significant impact*** (see criteria [a][2] and [e][2] under subsection 16.3.1, "Significance Criteria," above).

Table 16.12 shows existing freeway facility levels of service (LOS) ratings under Existing Plus Project conditions. As shown, one freeway segment would experience a significant impact.

Mitigation 16-1. LOS C operation could be achieved at the I-80 Westbound mainline diverge to John Muir Parkway off-ramp under Existing Plus Project conditions if the off-ramp had two exit lanes from the freeway rather than the one it has today. However, providing a second exit lane would require widening the freeway mainline, a mitigation measure which is considered to be infeasible due to substantial existing physical, cost and jurisdictional constraints. Therefore, the project contribution to this projected level-of-service deficiency is considered to represent a ***significant and unavoidable environmental impact***.

Table 16.12
EXISTING WITH PROJECT FREEWAY OPERATIONS

Freeway Facility	Facility Type	Peak Hour	Density (passenger cars/ lane/mile)/LOS[1] Without Project	With Project
	I-80 Facilities:			
1 I-80 WB on-ramp from Willow Ave	Merge	AM	32 / D	33 / D
		PM	24 / C	25 / C
2 I-80 WB off-ramp to John Muir Pkwy	Diverge	AM	**- / F**[2]	**- / F**[2]
		PM	34 / D	35 / D
3 I-80 WB from SR 4 to Pinole Valley Rd	Weave	AM	D	E
		PM	D	D
4 I-80 EB from Pinole Valley Road to SR 4	Basic	AM	26 / D	27 / D
		PM	35 / E	37 / E
5 I-80 EB off-ramp to EB SR 4 & Willow Ave	Diverge	AM	20 / B	20 / C
		PM	25 / C	26 / C
6 I-80 EB on-ramp from SR 4	Merge	AM	21 / C	21 / C
		PM	31 / D	32 / D
7 I-80 EB off-ramp to Willow Ave	Diverge	AM	24 / C	25 / C
		PM	35 / D	37 / E
	SR 4 Facilities:			
8 SR 4 WB east of Willow Ave	Basic	AM	14 / B	15 / B
		PM	20 / C	21 / C
9 SR 4 WB off-ramp to Willow Ave	Diverge	AM	20 / B	20 / B
		PM	26 / C	27 / C
10 SR 4 WB connector to I-80 EB & WB	Basic	AM	10 / B	11 / A
		PM	12 / B	12 / B
11 SR 4 EB on-ramp from Willow Ave	Merge	AM	13 / B	13 / B
		PM	15 / B	15 / B
12 SR 4 EB from Willow Ave to Sycamore Ave	Basic	AM	15 / B	15 / B
		PM	17 / B	18 / B

SOURCE: Fehr & Peers (2010)

Notes:
[1] Density = passenger cars per lane per mile. LOS = Level of Service.
[2] Demand exceeds capacity for merge and diverge sections.

16.3.4 Cumulative Plus Project Roadway System Impacts

Figure 16.11 shows traffic volume forecasts for the Cumulative (2035) Plus Project Conditions. Table 16.13 shows resulting intersection levels of service (LOS) ratings under Cumulative Plus Project conditions.

Impact 16-2: Cumulative Plus Project Impacts on Intersection Operations. As shown in Table 16.13, five "study intersections" would experience significant impacts--i.e., significant increases in delay--with or without the project. The addition of the project traffic to anticipated cumulative traffic at these intersections would exacerbate the impact--i.e., cause further increases in delay at the five intersections.

The five affected intersections include the following four intersections along San Pablo Avenue or Willow Avenue, WCCTAC-designated "routes of regional significance," which would already be operating at an unacceptable LOS F without the project:

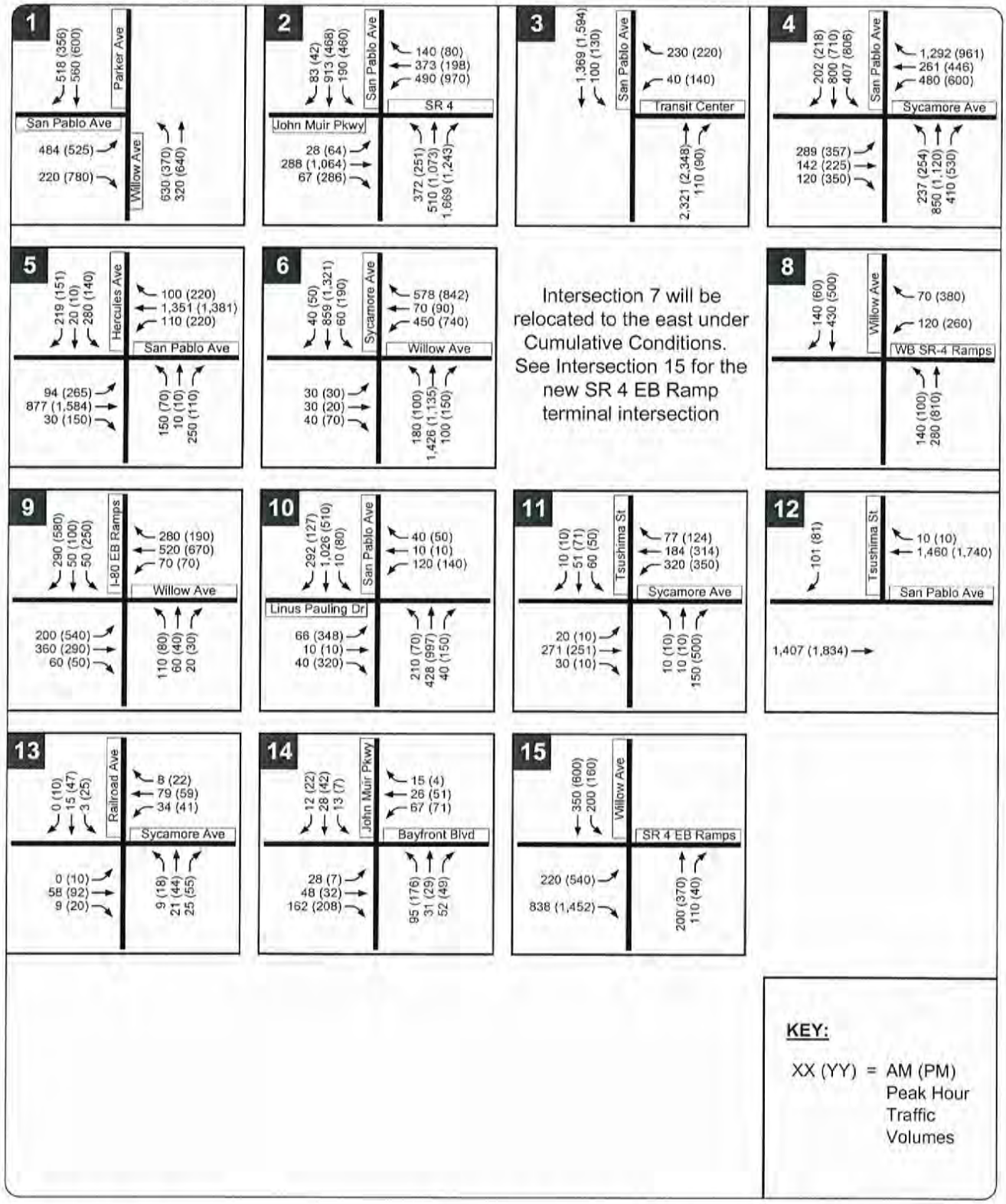
- Intersection #2, San Pablo Avenue/John Muir Parkway--AM and PM peak hour;
- Intersection #3, San Pablo Avenue/Old Transit Center Driveway--PM peak hour;
- Intersection #4, San Pablo Avenue/Sycamore Avenue--AM and PM peak hour; and
- Intersection #6, Willow Avenue/Sycamore Avenue--AM and PM peak hour.

The project addition to anticipated already unacceptable (LOS F) cumulative (2035) conditions at these four WCCTAC intersections would represent a ***significant impact*** (see criteria [a][2] and [e][1], first bullet, under section 16.3.1, "Significance Criteria," above).

As shown in Table 16.13, the five affected intersections also include the following local side-street stop intersection which would also already be operating at an unacceptable LOS F without the project:

- #11: Sycamore Avenue/Tsushima Street--AM and PM peak hour.

Because projected cumulative (2035) conditions at this currently unsignalized intersection would also meet the criteria for signalization based on a Caltrans peak hour traffic signal warrant, the project effect on anticipated future cumulative (2035) conditions at this local intersection (increased delay) would represent a ***significant impact*** (see criteria [a][1] and [e][1], second bullet, under subsection 16.3.1, "Significance Criteria," above).



SOURCE: Fehr & Peers

Figure 16.11
CUMULATIVE (2035) PLUS PROJECT TRAFFIC VOLUMES

Table 16.13
CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

	Study Intersection	Control	AM Delay[1]	AM LOS[2]	PM Delay[1]	PM LOS[2]
1	San Pablo/Willow	Signalized	50	D	50	D
2	San Pablo/John Muir	Signalized	**107**	**F**	**> 2 min**	**F**
3	San Pablo/Transit Center Dwy	Signalized	53	D	**> 2 min**	**F**
4	San Pablo/Sycamore	Signalized	**> 2 min**	**F**	**> 2 min**	**F**
5	San Pablo/Hercules	Signalized	42	D	30	C
6	Willow/Sycamore	Signalized	**> 2 min**	**F**	**> 2 min**	**F**
7	*Willow/Existing SR 4 EB Ramps*	*This intersection does not exist under Cumulative (2035) Conditions*				
8	Willow/SR 4 WB Ramps	Signalized	11	B	17	B
9	Willow/I-80 EB Ramps	Signalized	16	B	46	D
10	San Pablo/Linus Pauling	Signalized	19	B	17	B
11	Sycamore/Tsushima	Side-Street Stop	**56 (SB > 100)**	**F (SB F)**	**>100 (SB > 100)**	**F (SB F)**
12	San Pablo/Tsushima	Side-Street Stop	1 (SB 21)	A (SB C)	1 (SB 25)	A (SB D)
13	Sycamore/Railroad	All-Way Stop	8	A	8	A
14	Bayfront/John Muir Parkway	All-Way Stop	8	A	10	B
15	Willow/Diamond SR 4 EB Ramps	Signalized	12	B	20	C

SOURCE: Fehr & Peers (2010).

Notes:
[1] Delay = Seconds of average control delay per vehicle
[2] LOS = Level of Service

Mitigation 16-2. The project sponsor shall be responsible for a fair share contribution toward the cost of construction of the following intersection mitigation measures (diagrams of these recommended intersection mitigation measures are shown on Figure 16.12):

- **Measure 16-2-1:** To mitigate the project impact on intersection #2, San Pablo Avenue/John Muir Parkway, signalize the intersection of San Pablo Avenue/Tshushima Street, allowing full access to Tsushima Street, and provide a 150-foot minimum eastbound left-turn storage pocket. This mitigation measure is currently planned by the City of Hercules, but it is not currently fully funded. This signalization measure and new eastbound left-turn will decrease volumes along San Pablo Avenue through downtown Hercules by providing an alternative route.

Implementation of this mitigation measure would result in LOS B operation at this intersection under the Cumulative-Plus-Project condition during both the AM and PM peak hours--i.e., would reduce this impact to a ***less-than-significant*** level. Implementation of this measure would also be necessary to mitigate other identified intersection impacts in the downtown core area (see measures 16-2-2, 16-2-3 and 16-2-4 below).

- **Measure 16-2-2:** To mitigate the project impact on intersection #4, San Pablo Avenue/Sycamore Avenue, implement Measure 16-2-1 plus the following additional measures:

  (a) Widen Sycamore Avenue between Willow Avenue and San Pablo Avenue from a six-lane to a seven-lane cross-section, allowing a full block (Willow Avenue to San Pablo Avenue) of left-turn storage for vehicles turning from northbound Sycamore Avenue to westbound San Pablo Avenue. (This mitigation requirement is also identified in the recent City-certified New Town Center Project EIR.)

Implementation of this measure would result in acceptable LOS E operations during the AM peak hour, but the projected PM peak-hour delay would remain higher than under no-project conditions. No feasible additional mitigation has been identified for this project PM peak hour impact. Therefore, this impact would be considered ***significant and unavoidable.***

- **Measure 16-2-3:** To mitigate the project impact on intersection #3, San Pablo Avenue/Old Transit Center Driveway, implement Measures 16-2-1 and 16-2-2, plus the following additional measures:

(continued)

Mitigation 16-2 (continued):

(a) Add a second right-turn lane from northbound San Pablo Avenue to eastbound John Muir Parkway. The added second right-turn lane shall be extended south to the Old Transit Center Driveway intersection. (This mitigation requirement is also identified in the recent City-certified New Town Center Project EIR).

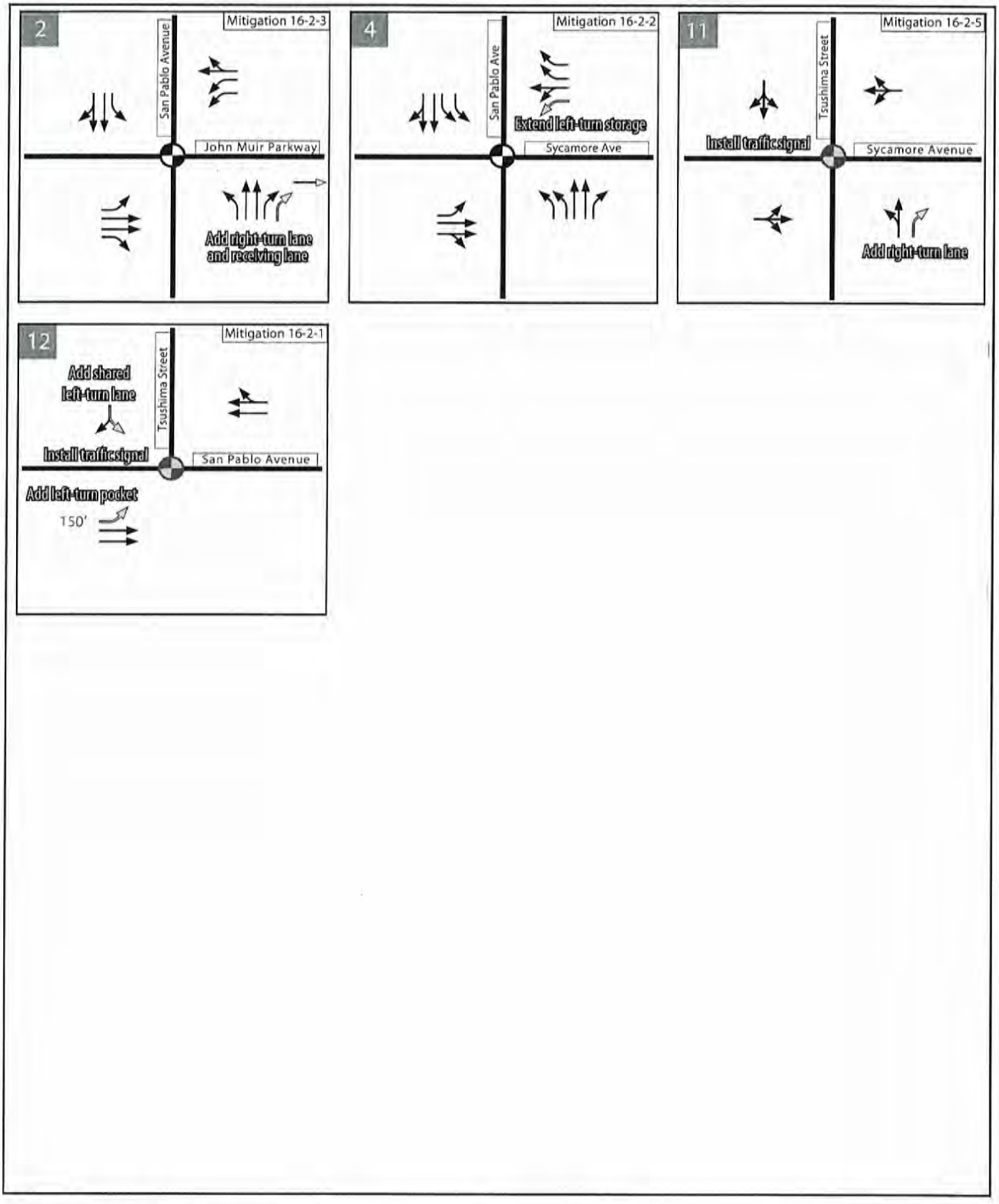
(b) Widen eastbound John Muir Parkway to four lanes from San Pablo Avenue to the SR 4 and I-80 ramps. This widened segment of John Muir Parkway would allow the two northbound San Pablo Avenue right-turn lanes to have exclusive receiving lanes serving the I-80 Westbound On-Ramp. The widening would also require widening of the I-80 Westbound On-Ramp from one to two lanes. (This mitigation requirement is also identified in the recent City-certified New Town Center Project EIR).

Implementation of these measures would result in acceptable LOS E operations during the AM peak hour and a decrease in intersection delay to below no-project levels during the PM peak hour--i.e., would reduce this impact to a ***less-than-significant*** level.

- **Measure 16-2-4:** To mitigate the project impact on intersection #6, Willow Avenue/Sycamore Avenue, implement Measures 16-2-2, which would reduce intersection delay at this intersection to below no-project levels--i.e., would reduce this impact to a ***less-than-significant*** level.

- **Measure 16-2-5:** To mitigate the project impact on intersection #11, Sycamore Avenue/Tsushima Street, install a traffic signal at the intersection and construct a northbound right-turn lane to provide a northbound intersection approach with both a shared through/left-turn lane and a right-turn lane.

Implementation of this measure would reduce intersection delay to City-acceptable levels--i.e., would reduce this impact to a ***less-than-significant*** level.



SOURCE: Fehr & Peers

Figure 16.12

INTERSECTION MITIGATION MEASURES

Impact 16-3: Cumulative Plus Project Impacts on Freeway Operations. As shown in Table 16.14, the addition of project traffic would result in significant impacts on projected cumulative (2035) unacceptable (LOS F) traffic operations on the following six of seven I-80 "study freeway facilities" evaluated in this EIR analysis:

- Facility #1, I-80 WB on-ramp from Willow Avenue--exacerbation of already projected LOS F operation in the AM peak hour; a change in LOS from E to F in the PM peak hour;
- Facility #2, I-80 WB off-ramp to John Muir Parkway--exacerbation of already projected LOS F operation in both the AM and PM peak hours;
- Facility #3, I-80 WB freeway segment from SR 4 to Pinole Valley Road--exacerbation of already projected LOS F operation in both the AM and PM peak hours;
- Facility #4, I-80 EB freeway segment from Pinole Valley Road to SR 4--exacerbation of already projected LOS F operation in the PM peak hour;
- Facility #5, I-80 EB off-ramp to EB SR 4--a change in LOS from D to F in the AM peak hour; exacerbation of already projected LOS F in the PM peak hour; and
- Facility #7, I-80 EB off-ramp to Willow Avenue--exacerbation of already projected LOS F in the PM peak hour.

These project effects on anticipated cumulative (2035) conditions at these six I-80 study freeway facilities would represent a ***significant impact*** (see criteria [a][2] and [e][2] under subsection 16.3.1, "Significant Criteria," above).

As also shown in Figure 16.14, the addition of project traffic would have a ***less-than-significant impact*** on projected cumulative (2035) operations at all five SR 4 "study freeway facilities."

Table 16.14
CUMULATIVE (2035) WITH PROJECT FREEWAY OPERATIONS

Freeway Facility	Facility Type	Peak Hour	Density (passenger cars/ lane/mile)/LOS[1] Without Project	With Project
	I-80 Facilities:			
1 I-80 WB on-ramp from Willow Ave	Merge	AM	- / F[2]	- / F[2]
		PM	39 / E	- / F[2]
2 I-80 WB off-ramp to John Muir Pkwy	Diverge	AM	- / F[2]	- / F[2]
		PM	- / F[2]	- / F[2]
3 I-80 WB from SR 4 to Pinole Valley Rd	Weave	AM	**F**	**F**
		PM	**F**	**F**
4 I-80 EB from Pinole Valley Road to SR 4	Basic	AM	31 / D	33 / D
		PM	**- / F**	**- / F**
5 I-80 EB off-ramp to EB SR 4	Diverge	AM	30 / D	**- / F**
		PM	- / F[2]	- / F[2]
6 I-80 EB on-ramp from SR 4	Merge	AM	25 / C	25 / C
		PM	37 / E	37 / E
7 I-80 EB off-ramp to Willow Ave	Diverge	AM	29 / D	30 / D
		PM	**- / F**	**- / F**
	SR 4 Facilities:			
8 SR 4 WB east of Willow Ave	Basic	AM	19 / C	20 / C
		PM	24 / C	25 / C
9 SR 4 WB off-ramp to Willow Ave	Diverge	AM	24 / C	25 / C
		PM	30 / D	31 / D
10 SR 4 WB connector to I-80 EB & WB	Basic	AM	15 / B	16 / B
		PM	13 / B	14 / B
11 SR 4 EB from I-80 EB to Willow Avenue[3]	Weave	AM	C	C
		PM	E	E
12 SR 4 EB on-ramp from Willow Avenue	Merge	AM	24 / C	24 / C
		PM	24 / C	25 / D

SOURCE: Fehr & Peers (2010).

Notes:
[1] Density = passenger cars per lane per mile. LOS = Level of Service.
[2] Demand exceeds capacity for merge and diverge sections.
[3] The eastbound Willow Avenue ramps relocation creates a new weaving section between I-80 and the new Willow Avenue eastbound off-ramp.

Mitigation 16-3. The project sponsor shall establish and implement a Hercules Bayfront Project TDM Program that, at a minimum, incorporates all project-related property sales and leasing agreements a requirement that all project homeowners associations and employees shall participate in the 511 Contra Costa Transportation Demand (TDM) Program (see subsection 16.2.1[f] herein).

Implementation of this measure would serve to reduce the project contribution to anticipated cumulative (2035) I-80 freeway facility operational impacts, but not to less-than-significant levels. The physical improvements to these six affected I-80 freeway facilities necessary to reduce projected cumulative (2035) LOS F peak period delay conditions to below no-project levels would consist of adding capacity to the freeway through the addition of travel lanes and/or lanes to off- and on-ramp influence areas; however, adding additional lanes as a project-specific mitigation is considered infeasible due to the physical, environmental, jurisdictional and cost constraints associated with acquiring the necessary additional rights-of-way, reconstructing or widening bridge structures, related retaining wall construction, etc. A number of I-80 freeway enhancement projects are currently being considered by the regional transportation agencies (CCTA, MTC and Caltrans) to maximize person-flow along the corridor (ramp metering, HOV lanes, variable speed limit signs, etc.). Future implementation of these measures would be expected to reduce cumulative (2035) freeway corridor operational impacts with or without the project, but not to less-than-significant levels. The project contribution to these anticipated cumulative (2035) freeway facility impacts would therefore represent a ***significant and unavoidable environmental impact***.

16.3.5 Alternative Mode Transportation System Impacts

Pedestrian System Impacts. The project internal street network has been designed around short development blocks with sidewalks and on-street parking and loading. This design approach is advocated by the City's WDMP to provide a comfortable pedestrian environment for people walking between the mix of uses on site. Bayfront Boulevard, the project "main street," would be lined with retail/commercial uses and have wider sidewalks with opportunities for frontage pedestrian amenities that facilitate walking.

According to the California Vehicle Code, the extensions of sidewalks are considered unmarked crosswalks, and represent legal crossing for pedestrians. As such, project sidewalk termini designs would need to comply with federal Americans With Disabilities Act (ADA) regulations for access to crosswalks. ADA compliance typically requires directional curb ramps (two at each corner) aligned with the extension of the sidewalk in each direction. This design treatment is typically achieved with curb extensions (or bulb-outs) so each corner can accommodate two curb ramps.

As a shared facility with the ITC project, a pedestrian barrier would exist along the length of the adjacent railroad track preventing at-grade pedestrian crossing (i.e., the retaining wall with

fencing on top), and a gate would block pedestrian access to the at-grade emergency vehicle crossing.

Considering the information above, project pedestrian system impacts are considered ***less-than-significant***.

Mitigation: No significant project-related adverse pedestrian system impact has been identified; no mitigation is required.

Impact 16-4: Potential Bicycle Lane Gap on John Muir Parkway. The proposed bicycle circulation system, as currently designed for the ITC project and considered supporting public infrastructure for the Hercules Bayfront Project, could potentially result in an unsafe gap and a lack of convenient connection between planned Class II (on-street) bike lanes along the John Muir Parkway approach to the project site and the project-proposed Class I (separated) bike path along Refugio Creek connecting with the Bay Trail, representing a potentially ***significant impact*** on bicycle circulation safety (see criteria [a][3], [a][5], and [e][3][ii] under subsection 16.3.1, "Significance Criteria," above).

South of the project site, bicycle riders would need to transition between the Class II John Muir Parkway on-street bike lanes and the Class I (i.e., dedicated separate bike path) facility along Refugio Creek, connecting to the Bay Trail. This transition is intended to complete a needed link in the regional bicycle network, allowing through bicycle access within the Hercules Bayfront Project site, as well as connecting the project and proposed ITC to other locations along the Bay Trail and elsewhere in Hercules. Bicycle parking would also be provided within each development block within the Hercules Bayfront Project site.

For many riders, especially those living or working within the project site, the transition between the John Muir Parkway Class II facility and on-site Class I facility would be inconvenient by potentially requiring the bicyclist to dismount and cross John Muir Parkway to the bike path along Refugio Creek. As a result, many riders could be expected to continue on John Muir Parkway even after the bike lanes on that route have ended. This condition has several negative safety implications, including that it introduces a gap in the bicycle network as bicyclists must transition from the Class II to Class I facility, and introduces additional conflicts as bicyclists make decisions between using the Class I and Class II facilities or continuing on John Muir Parkway with no bike lanes.

Mitigation 16-4. At the discretion of the City: (1) construct a flashing crosswalk at the street crossing from the on-street John Muir Parkway bike lanes to the off-street Refugio Creek bike path, which would be activated by the bicyclist to help ensure a safe crossing; or (2) continue the Creekside Trail to San Pablo Avenue by removing the sidewalk along the west side of John Muir Parkway and constructing the multi-use trail. Implementation of either one of these measures would reduce this potential bike safety impact to a ***less-than-significant level***.

Transit System Impacts. The proposed Intermodal Transit Center (ITC) would be located adjacent to the Hercules Bayfront Project site, serving as a multi-modal anchor for the project vicinity. The ITC project would include a new Capitol Corridor station and the roadway/trail/sidewalk infrastructure necessary to support the facility (see section 3.2.5[a] of this Draft EIR for additional detail on the ITC). The Hercules Bayfront Project would facilitate transit usage effectively by providing multi-family residential and mixed-use (residential/commercial) opportunities for residents and businesses that are highly convenient to the planned ITC adjacent to the Hercules Bayfront Project site. This project characteristic represents a transit-related beneficial environmental impact. No adverse impacts to transit are expected.

Mitigation: No significant adverse impacts have been identified; no mitigation is required.

Project Internal Circulation Impacts. The project-proposed internal circulation system was reviewed by Fehr & Peers, EIR transportation consultants, with respect to the movement of vehicles, bicyclists, and pedestrians; for safety and accessibility; and for coordination with the proposed ITC internal circulation system. EIR Figures 3.6 (Proposed Site Plan) and 3.8 (Proposed Street and Circulation Regulating Plan--Hercules Bayfront Project) in chapter 3 (Project Description) illustrate the proposed project internal circulation system.

Fehr & Peers did not identify any potentially significant internal circulation operational or safety deficiencies except for the potential bike lane gap on John Muir Parkway (described above under Impact Mitigation 16-4).

In addition, the City's subsequent subdivision review process would include verification by City staff that project internal circulation roadway layout geometrics meet City subdivision standards and Fire District emergency access standards (also see EIR section 15.2, Fire Protection and Emergency Medical Services). Therefore, project internal circulation impacts are considered ***less-than-significant.***

Mitigation. No additional significant project internal circulation impact has been identified; no mitigation is required.

16.3.6 Parking Analysis

The following discussion is provided for informational purposes only. Parking impacts in and of themselves are not considered physical environmental impacts pursuant to CEQA. The Court of Appeal held in a San Francisco case[1] that parking is not part of the permanent physical environment, that parking conditions change over time as people change their travel patterns, and that unmet parking demand created by a project need not be considered a significant environmental impact under CEQA unless it would cause significant secondary effects, such as increased carbon monoxide hot spots at intersections. The project as currently designed by the project applicant would provide 2,130 off-street parking spaces and an as-yet undetermined number of on-street spaces.

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[1]San Franciscans Upholding the Downtown Plan et al. v. City and County of San Francisco; Court of Appeal, First District, Division 3, California; Sept. 30, 2002.

1. WDMP Parking Analysis. Table 16.15 presents project-related parking requirements based on the WDMP. The WDMP requires a minimum of two spaces per 1,000 square feet of non-residential use, and one parking space per 1,500 square feet of residential space. The project average residential unit size has not been finalized, but has been conservatively assumed for this analysis to be 1,200 square feet. The 2,130 off-street parking spaces currently proposed for the project site exceed the calculated WDMP requirement of 1,606 spaces as shown in Table 16.15.

2. Shared Parking Analysis. "Shared parking analysis" takes into account the fact that different land uses draw the maximum parking demand at varying times of the day and year. Therefore, the total parking supply need for a mix of land uses can be less than the sum of the maximum parking supply needed for each individual land use type. A spreadsheet software package developed by the Urban Land Institute (ULI) was used to analyze shared parking requirements for the proposed project.

Parking ratios assumed for each land use are summarized in Table 16.16. These numbers reflect the maximum number of parking spaces generated if each land use were operated independently, without any shared parking.

Table 16.17 presents the summary of the shared parking analysis results for the peak month of the year (December). As indicated, the project's peak combined parking demand would occur on a December weekday at about 2:00 PM, when the peak shared parking need would reach approximately 2,650 spaces. Additional calculations were prepared to determine the month-by-month variation in weekday parking demand at 2:00 PM. Figure 16.13 illustrates that the weekday month-to-month parking conditions vary between about 2,450 and 2,650 parking spaces. Figure 16.14 illustrates the weekend month-to-month parking conditions, which vary between about 2,200 and 2,375 parking spaces.

The shared parking analysis shows that an additional 520 parking spaces may be required to accommodate the project's peak parking demand. The project would construct new roads within its approximately 42.36-acre site. The on-street parking provided on these roads (estimated to be about 400 spaces) would off-set some of the excess parking demand calculated through the shared parking analysis. The remaining unmet parking demand (about 120 spaces) would likely shift to the adjacent neighborhoods, probably within one (or at most) two blocks of the project site.

Table 16.15
WDMP INITIATIVE PARKING REQUIREMENTS FOR THE PROJECT

Land Use	Units	Quantity	Minimum Parking Ratio/1,000 sf[1]	Minimum Spaces Required[6]
Residential	du[2] (sf)	1,267 du (1,520,400 sf[3])	0.67	845
Non-Residential[4]	sf	339,000 sf	2.00	678
Hotel	rooms (sf)	125 (125,000 sf[5])	0.67	84
TOTAL				1,606

SOURCE: Fehr & Peers (2010) based on WDMP.

Notes:
[1] sf = square feet
[2] du = dwelling units
[3] Assuming 1,200 square feet per dwelling unit
[4] The 134,000 square feet of flex-space was conservatively analyzed as commercial space, to avoid under-predicting parking demand.
[5] Assuming 1,000 square feet per room
[6] Product of "Quantity" and "Minimum Parking Ratio" columns.

Table 16.16
ULI SHARED PARKING RATIOS FOR THE PROJECT

Land Use	Units	Quantity	Parking Ratios[3] Weekday	Weekend
Multi-Family	du[1]	1,267 du	1.65	1.65
Retail	sf[2]	157,000 sf	3.60	4.00
Office	sf	182,000 sf	3.28	0.34
Hotel	rooms	125 rooms	1.13	0.97

SOURCE: Fehr & Peers (2010) based on ULI's Shared Parking, 2nd Edition (2005)

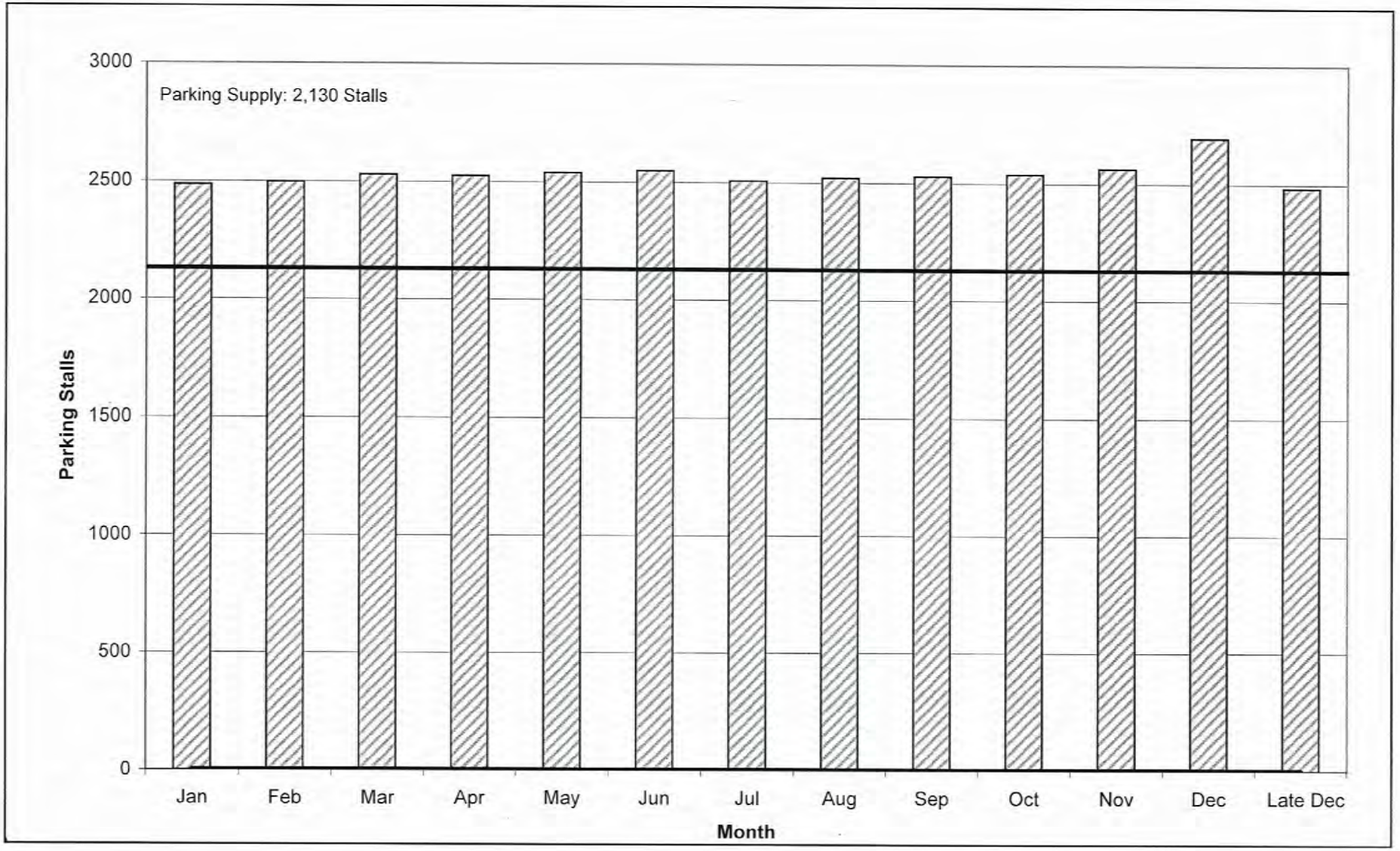
Notes:
[1] du = dwelling units
[2] sf = square feet
[3] The parking ratio reflects the maximum number of parking spaces generated if each land use were operated independently, without any shared parking.

Table 16.17
Hercules Bayfront
Project Buildout

SHARED PARKING DEMAND SUMMARY

PEAK MONTH: DECEMBER -- PEAK PERIOD: 2 PM, WEEKDAY

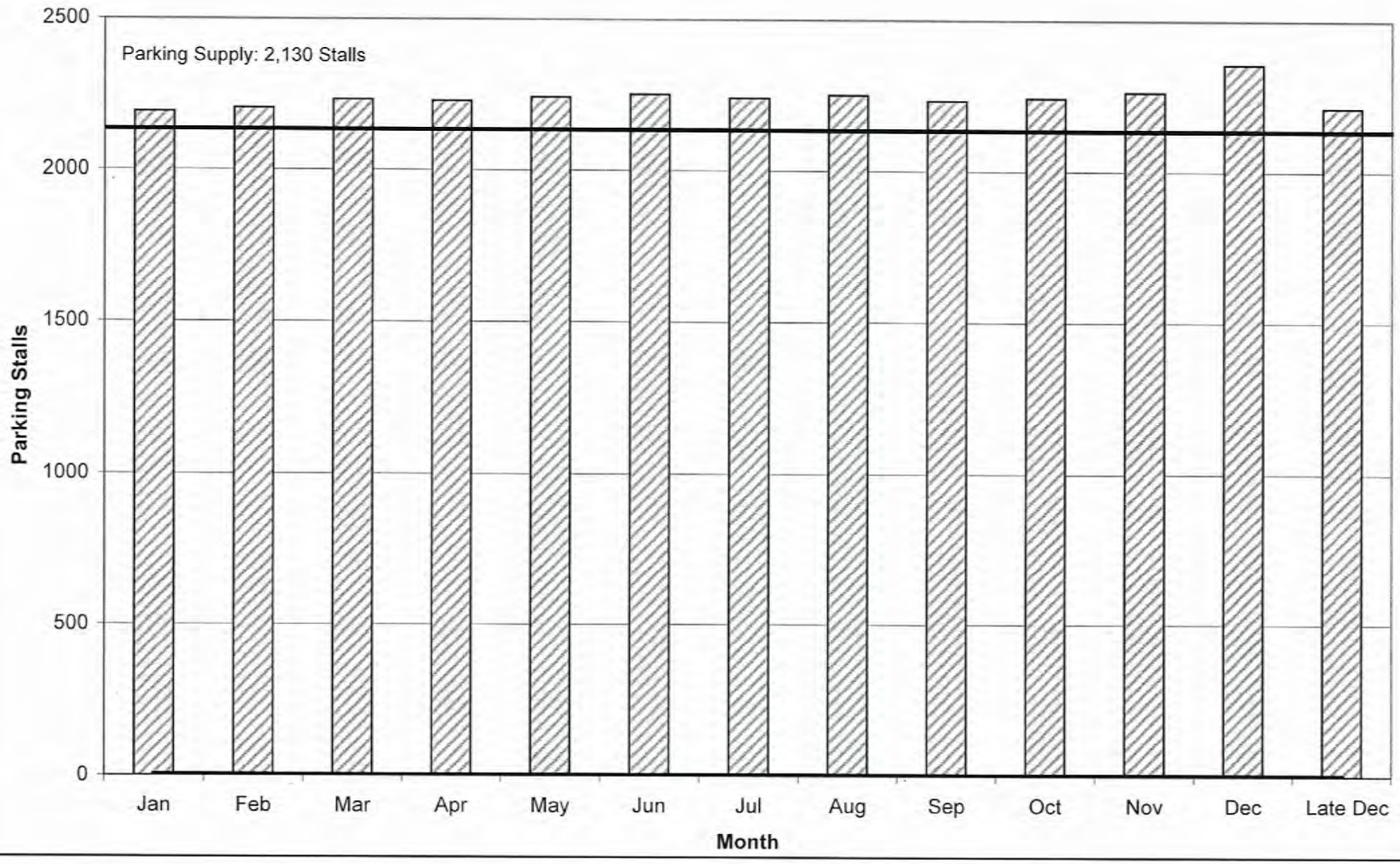
			Weekday					Weekend					Weekday			Weekend		
Land Use	Project Data Quantity	Unit	Base Rate	Mode Adj	Non-Captive Ratio	Project Rate	Unit	Base Rate	Mode Adj	Non-Captive Ratio	Project Rate	Unit	Peak Hr Adj 2 PM	Peak Mo Adj December	Estimated Parking Demand	Peak Hr Adj 7 PM	Peak Mo Adj December	Estimated Parking Demand
Community Shopping Center (<400 ksf)	157,000	sf GLA	2.90	0.90	1.00	2.61	/ksf GLA	3.20	0.90	1.00	2.88	/ksf GLA	1.00	1.00	410	0.75	1.00	339
Employee			0.70	0.75	1.00	0.53	/ksf GLA	0.80	0.75	1.00	0.60	/ksf GLA	1.00	1.00	83	0.80	1.00	76
Hotel-Business	125	rooms	1.00	0.90	1.00	0.90	/rooms	0.90	0.90	1.00	0.81	/rooms	0.60	0.67	45	0.75	0.67	51
Employee			0.25	0.90	1.00	0.23	/rooms	0.18	0.90	1.00	0.16	/rooms	1.00	1.00	29	0.55	1.00	11
Residential, Rental, Shared Spaces	1,267	units	0.50	0.75	1.00	0.38	/unit	0.50	0.75	1.00	0.38	/unit	0.70	1.00	333	0.97	1.00	461
Reserved	1	sp/unit	1	1.00	1.00	1	/unit	1	1.00	1.00	1	/unit	1.00	1.00	1,267	1.00	1.00	1,267
Guest	1,267	units	0	0.90	1.00	0	/unit	0	0.90	1.00	0	/unit	0.20	1.00	34	1.00	1.00	171
Office 100 to 500 ksf	182,000	sf GLA	0.24	0.90	1.00	0.22	/ksf GLA	0.03	0.90	1.00	0.03	/ksf GLA	1.00	1.00	40	0.00	1.00	0
Employee			3.04	0.75	1.00	2.28	/ksf GLA	0.31	0.75	1.00	0.23	/ksf GLA	1.00	1.00	415	0.00	1.00	0
													Customer		529	Customer		561
													Employee/Resident		860	Employee		548
													Reserved		1267	Reserved		1267
													Total		2656	Total		2376
													Shared Parking Reduction		24%			32%



SOURCE: Fehr & Peers

Figure 16.13

WEEKDAY MONTH-BY-MONTH ESTIMATED PARKING DEMAND



SOURCE: Fehr & Peers

Figure 16.14

WEEKEND MONTH-BY-MONTH ESTIMATED PARKING DEMAND