

4.13 TRANSPORTATION AND TRAFFIC

The potential traffic impacts of the proposed project are evaluated in detail in the *City Place Sky Lofts Traffic Impact Study* (P&D Consultants, 2007). The findings of the traffic study are summarized in this section. The complete Traffic Report is provided in Appendix H of this DEIR.

It should be noted that the traffic analysis presented in this DEIR was based on a previous project description of 355 dwelling units, which was available at the time of preparation. The proposed project has been downsized by two dwelling units from 355 dwelling units to 353 dwelling units. The reduction in two dwelling units for the proposed project would not fundamentally change the methodology, traffic analysis, findings, and recommendations presented in this DEIR.

4.13.1 EXISTING SETTING RELATED TO TRANSPORTATION AND TRAFFIC

This section describes the existing conditions in the study area, including major land uses, parking facilities, vehicular volumes, road segments and intersection operational characteristics, and existing Level of Service (LOS).

4.13.1.1 Existing Major Land Uses

Land uses to the north and west of the proposed project consist of commercial retail and office space. Land uses to the south and east consist of multi-family residential units. Santiago Park is located on the southern side of Memory Lane.

4.13.1.2 Existing Circulation Network

The following describes the current road operational characteristics in the study area:

Main Street is a four-lane north-south Primary Arterial between Chapman Avenue and Culver Avenue/Stewart Drive and between Buffalo Avenue and 17th Street. Main Street is a five-lane north-south Primary Arterial between Culver Avenue/Stewart Drive and La Veta Avenue and a six-lane north-south Major Arterial from La Veta Avenue to Buffalo Avenue. Main Street between Culver Avenue/Stewart Drive and La Veta Avenue has two northbound lanes and three southbound lanes. Main Street is classified as a Major Arterial based on the Orange County Master Plan of Arterial Highways (MPAH) circulation network.

Main Street has a two-way left-turn lane (TWLTL) painted median between Chapman Avenue and La Veta Avenue and between Buffalo Avenue and 17th Street. The road has a raised median between La Veta Avenue and Buffalo Avenue. Parking is prohibited on Main Street except for metered parking spaces on the eastern side of the road between Buffalo Avenue and 17th Street. The posted speed limit is 40 miles per hour (mph) north of Town & Country Road and 30 mph south of Town & Country Road.

Broadway is a four-lane north-south Secondary Arterial as classified on the MPAH. The road has a TWLTL-painted median. Parking is prohibited on Broadway. The posted speed limit is 40 mph.

Parker Street is two-lane north-south Collector as classified on the MPAH. The road has a TWLTL painted median. Parking is permitted on Parker Street. The posted speed limit is 40 mph. Parker Street changes to Memory Lane at the City of Santa Ana boundary limits.

Pepper Street is a two-lane north-south local road. The road has no median. Parking is prohibited on Pepper Street. The speed limit is 25 mph.

Batavia Street is a two-lane north-south Collector as classified on the MPAH. The road has no median. Parking is permitted on Batavia Street. The posted speed limit is 30 mph.

Lawson Way is a two-lane north-south Collector as classified on the MPAH. The road has a TWLTL painted median. Parking is permitted on Lawson Way in the City of Orange. Parking on this street is prohibited in the City of Santa Ana. The speed limit is 25 mph.

Chapman Avenue is a six-lane east-west Major Arterial west of Main Street and a four-lane east-west Primary Arterial east of Main Street. Chapman Avenue is classified as a Primary Arterial on the MPAH. Parking is prohibited on Chapman Avenue. The posted speed limit is 40 mph.

La Veta Avenue is a four-lane east-west Primary Arterial east of Main Street and west of Parker Street and a six-lane east-west Major Arterial between Main Street and Parker Street. La Veta Avenue is classified as a Primary Arterial on the MPAH. The road has a TWLTL painted median. Parking is prohibited on La Veta Avenue. The posted speed limit is 35 mph.

Palmyra Avenue is a two-lane east-west local road. The road has no median. Parking is permitted on Palmyra Avenue. The speed limit is 25 mph.

Culver Avenue/Stewart Drive is a two-lane east-west local road. The road has no median. Parking is permitted on Culver Avenue/Stewart Drive. The speed limit is 25 mph.

Town & Country Road is a four-lane east-west Primary Arterial as classified on the MPAH. The road has a raised median. Parking is prohibited on Town & Country Road except for the southern side of the road between Lawson Way and Parker Street. The posted speed limit is 35 mph.

Memory Lane is a six-lane east-west Major Arterial as classified on the MPAH. The road has a raised median. Parking is prohibited on Memory Lane. The posted speed limit is 35 mph. Memory Lane changes to Parker Street at the City of Orange boundary limits.

Santa Clara Avenue is a five-lane east-west Primary Arterial. The road has no median. Parking is prohibited on Santa Clara Avenue. The speed limit is 25 mph.

Buffalo Avenue is a two-lane one-way eastbound Local Commercial Road as classified by the City of Santa Ana. Parking is prohibited on Buffalo Avenue. The posted speed limit is 25 mph.

20th Street is a two-lane east-west Local Commercial Road as classified by the City of Santa Ana. The road has no median. Parking is permitted on 20th Street. The speed limit is 25 mph.

17th Street is a six-lane east-west Major Arterial as classified on the MPAH. The road has a raised median. Parking is prohibited on 17th Street. The posted speed limit is 40 mph.

The following describes the current intersection lane configurations in the study area:

1. Main Street at Chapman Avenue is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on the northbound approach. One exclusive left-turn lane is provided on the southbound, eastbound and westbound approaches. One exclusive right-turn lane is provided on all approaches. The northbound right-turn lane has a protected right-turn phase that is overlapped with

- the westbound left-turn phase. The eastbound right-turn lane has a protected right-turn phase that is overlapped with the northbound left-turn phase. The westbound right-turn lane has a protected right-turn phase that is overlapped with the southbound left-turn phase. Marked crosswalks are available on all legs of the intersection.
2. Main Street at Palmyra Avenue is a signalized four-legged intersection. One exclusive left-turn lane is provided on each of the northbound and southbound approaches. An unstriped right-turn lane is assumed for the eastbound and westbound approaches because the distance measured to the outside through lane is 19 feet or greater. Marked crosswalks are available on all legs of the intersection.
 3. Main Street at Culver Avenue/Stewart Drive is a signalized four-legged intersection. One exclusive left-turn lane is provided on all approaches. One exclusive right-turn lane is provided on the eastbound approach. An unstriped right-turn lane is assumed for the westbound approach because the distance measured to the outside through lane is 19 feet or greater. Marked crosswalks are available on all legs of the intersection.
 4. Main Street at La Veta Avenue is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on all approaches. One exclusive right-turn lane is provided on the northbound and westbound approaches. The northbound right-turn lane has a protected right-turn phase that is overlapped with the westbound left-turn phase. The westbound right-turn lane has a protected right-turn phase that is overlapped with the southbound left-turn phase. Marked crosswalks are available on all legs of the intersection.
 5. Pepper Street at La Veta Avenue is a signalized four-legged intersection. One exclusive left-turn lane is provided on the eastbound and westbound approaches. One exclusive right-turn lane is provided on the northbound and southbound approaches. Marked crosswalks are available on all legs of the intersection.
 6. SR 22 westbound ramps at La Veta Avenue is a signalized three-legged intersection. Two exclusive left-turn lanes are provided on the northbound approach. One exclusive left-turn lane is provided on the westbound approach. One exclusive right-turn lane is provided on each of the northbound and eastbound approaches. The eastbound approach consists of one free right-turn. The northbound right-turn lane has a protected right-turn phase that is overlapped with the westbound left-turn phase. Marked crosswalks are available on the south and west legs of the intersection.
 7. Batavia Street at La Veta Avenue is a signalized three-legged intersection. One exclusive left-turn lane is provided on the southbound and eastbound approaches. Two exclusive right-turn lanes are provided on the southbound approach. One exclusive right-turn lane is provided on the westbound approach. The southbound right-turn lanes have a protected right-turn phase that is overlapped with the eastbound left-turn phase. Marked crosswalks are available on the north and west legs of the intersection.
 8. Parker Street at La Veta Avenue is a signalized four-legged intersection. One exclusive left-turn lane is provided on all approaches. One exclusive right-turn lane is provided on the northbound and southbound approaches. No through lanes are provided on the northbound and southbound approaches. Marked crosswalks are provided on the north, south and west legs of the intersection.
 9. Main Street at Town & Country Road is a signalized four-legged intersection. Two exclusive left-turn lanes and one exclusive right-turn lane are provided on the northbound and southbound approaches. The eastbound approach consists of one left-turn lane, one shared through/left-turn lane, one through lane, and one right-turn lane. The westbound approach consists of one left-turn lane, one

shared through/left-turn lane, one through lane, and two right-turn lanes. The southbound right-turn lane has a protected right-turn phase that is overlapped with the eastbound left-turn phase. The westbound right-turn lanes have a protected right-turn phase that is overlapped with the southbound left-turn phase. Marked crosswalks are provided on the south, east and west legs of the intersection.

10. SR 22 eastbound ramps/Lawson Way at Town & Country Road is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on the eastbound approach. One exclusive left-turn lane is provided on the northbound and westbound approaches. One exclusive right-turn lane is provided on the westbound approach. An unstriped right-turn lane is assumed for the northbound and eastbound approaches because the distance measured to the outside through lane is 19 feet or greater. The southbound approach consists of one left-turn lane, one shared through/right-turn lane and one right turn lane. Marked crosswalks are provided on the north, south and west legs of the intersection.
11. Parker Street at Town & Country Road is a signalized four-legged intersection. One exclusive left-turn lane is provided on all approaches. One exclusive right-turn lane is provided on the eastbound approach. An unstriped right-turn lane is assumed for the northbound, southbound and westbound approaches because the distance measured to the outside through lane is 19 feet or greater. Marked crosswalks are provided on all legs of the intersection.
12. Main Street at the Entrance/Exit of Westfield MainPlace Mall is a signalized three-legged intersection. Two exclusive left-turn lanes are provided on the northbound approach. One exclusive left-turn lane and one exclusive right-turn lane are provided on the eastbound approach. Marked crosswalks are provided on all legs of the intersection.
13. Main Street at Memory Lane is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on all approaches. One exclusive right-turn lane is provided on the westbound approach. Marked crosswalks are provided on all legs of the intersection.
14. Lawson Way at Memory Lane is a two-way stop-control (TWSC) intersection with stop controls on the northbound and southbound approaches. One exclusive left-turn lane is provided on all approaches. One exclusive right-turn lane is provided on the southbound approach. No marked crosswalks are provided for the intersection.
15. Main Street at I-5 High Occupancy Vehicle (HOV) ramps/I-5 northbound off-ramp/Edgewood Road is a signalized five-legged intersection. Two exclusive left-turn lanes are provided on the northbound approach. One exclusive left-turn lane and one exclusive right-turn lane are provided on the southbound approach. The eastbound and westbound approaches consist of one shared through/left-turn lane and one right-turn lane. The fifth leg of the intersection consists of two right-turn lanes from the I-5 northbound off-ramp onto northbound Main Street. Marked crosswalks are provided on the north, east and west legs of the intersection.
16. Broadway at Santa Clara Avenue is a signalized four-legged intersection. One exclusive left-turn lane is provided on each of the southbound and westbound approaches. One exclusive right-turn lane is provided on the westbound approach. Marked crosswalks are provided on the south, east and west legs of the intersection.
17. Main Street at I-5 northbound on-ramp/I-5 southbound off-ramp/Santa Clara Avenue is a signalized five-legged intersection. Two exclusive left-turn lanes are provided on the northbound and southbound approaches. One exclusive right-turn lane is provided on the northbound approach. The eastbound approach consists of one left-turn lane, one shared through/left-turn lane and one shared

through/right-turn lane. The fifth leg of the intersection consists of two right-turn lanes from the I-5 southbound off-ramp onto southbound Main Street. Marked crosswalks are provided on the south, east and west legs of the intersection.

18. Main Street at I-5 southbound on-ramp/Buffalo Avenue is a signalized four-legged intersection. Two left-turn lanes are provided on the southbound approach. An unstriped right-turn lane is assumed for the northbound approach because the distance measured to the outside through lane is 19 feet or greater. The eastbound approach consists of one shared through/left-turn lane and one shared through/right-turn lane. Marked crosswalks are provided on the south, east and west legs of the intersection.
19. Main Street at 20th Street is a signalized four-legged intersection. One exclusive left-turn lane is provided on each of the northbound and southbound approaches. An unstriped right-turn lane is assumed for the eastbound and westbound approaches because the distance measured to the outside through lane is 19 feet or greater. Marked crosswalks are provided on all legs of the intersection.
20. Broadway at 17th Street is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on the eastbound and westbound approaches. One exclusive left-turn lane is provided on the northbound and southbound approaches. An unstriped right-turn lane is assumed for the northbound and southbound approaches because the distance measured to the outside through lane is 19 feet or greater. Marked crosswalks are provided on all legs of the intersection.
21. Main Street at 17th Street is a signalized four-legged intersection. Two exclusive left-turn lanes are provided on all approaches. One exclusive left-turn lane is provided on the northbound approach. Marked crosswalks are provided on all legs of the intersection.

The existing circulation network is shown on Figure 4.13-1.

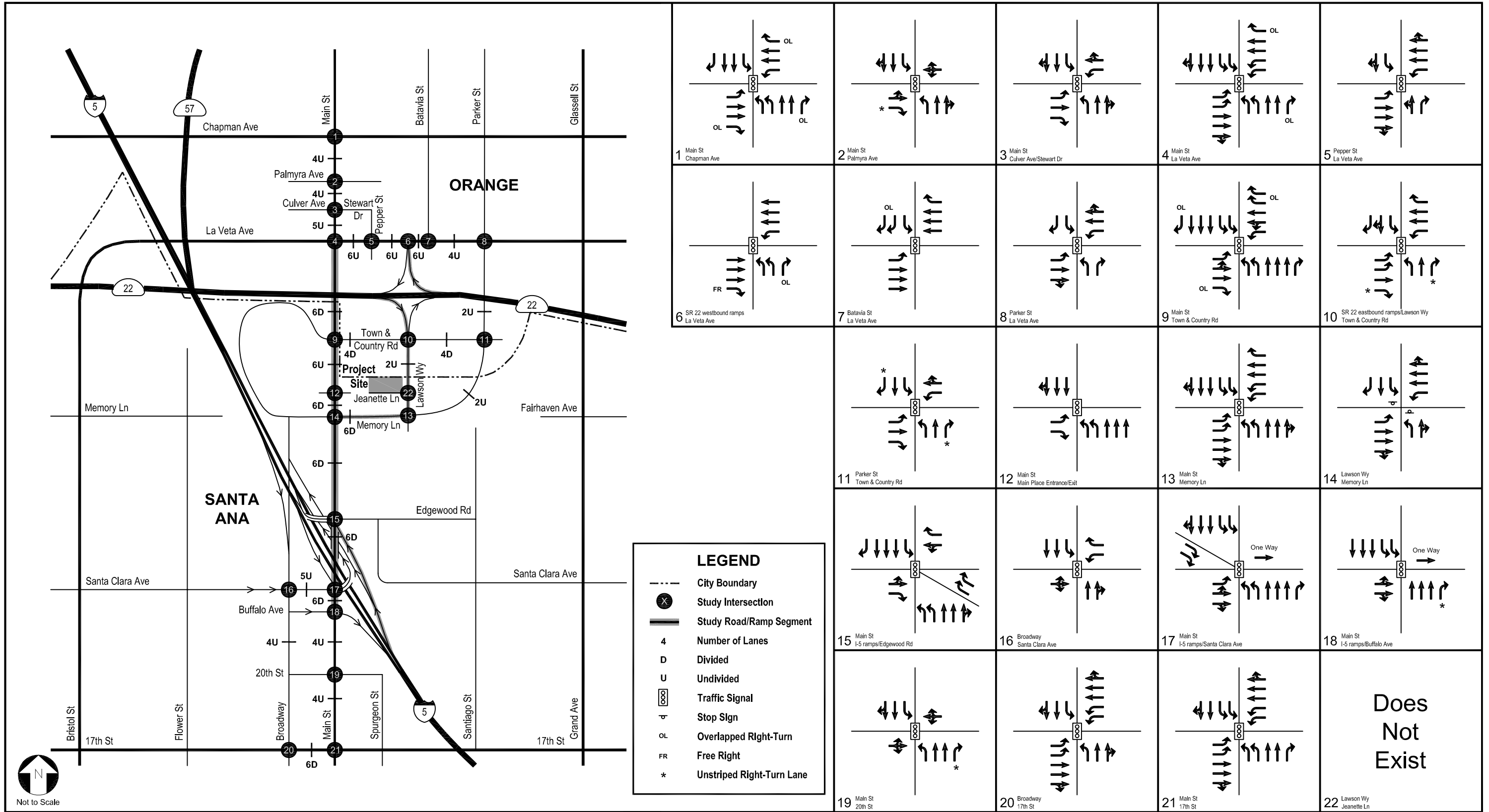
4.13.1.3 Existing Vehicular Traffic Volumes

The existing traffic counts used in this study were taken in April 2007. Intersection turning movement counts were conducted at the study intersections during the A.M. peak period of 7:00 A.M. to 9:00 A.M. and the P.M. peak period of 4:00 P.M. to 6:00 P.M. Road segment daily traffic counts were taken at the study road segments during the same weekday. These traffic counts represent existing traffic conditions and are shown on Figure 4.13-2.

4.13.1.4 Existing Transit Services

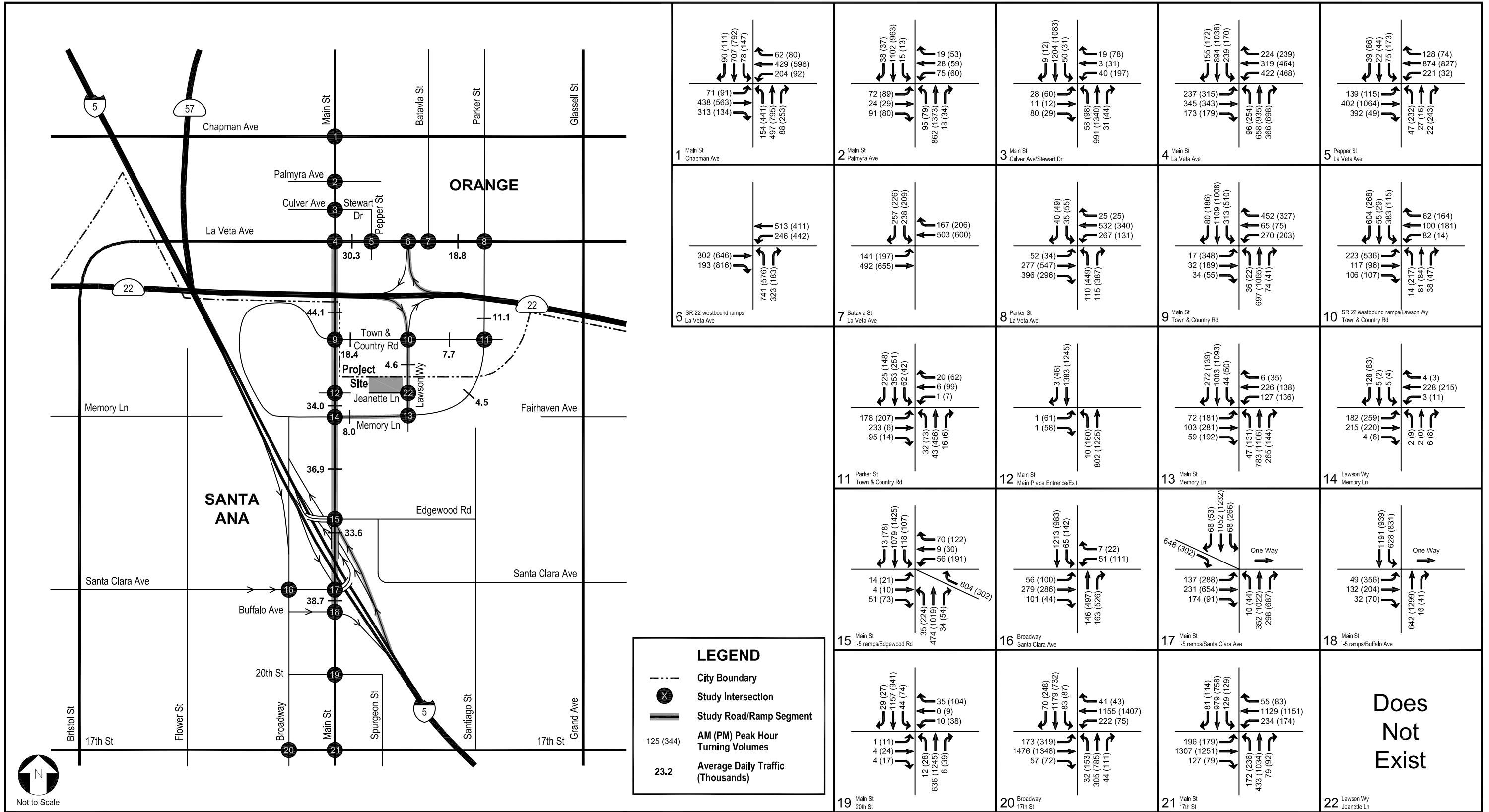
OCTA operates fixed transit bus routes in the vicinity of the proposed project and throughout Orange County. The following OCTA bus routes would directly serve the proposed project:

- Route 53: Brea – Irvine via Main Street
- Route 147: Brea – Santa Ana via La Veta Avenue/Main Street
- Route 453: Orange Transportation Center – St. Joseph’s Hospital via Chapman Avenue/Main Street/La Veta Avenue
- Route 757: Pomona – Santa Ana Express via SR 57 Freeway



Source: P&D Consultants (2007).

**Figure 4.13-1
Circulation Network
Existing Conditions**



Source: P&D Consultants (2007).

Figure 4.13-2
Traffic Volumes
Existing Conditions

4.13.1.5 Existing Level of Service

The concept of LOS was developed to evaluate the operating conditions of the circulation network. As defined in the *Highway Capacity Manual (HCM)* (Transportation Research Board (TRB), 2000), LOS is a qualitative measure which describes the operational conditions of a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. LOS is rated A through F, with LOS A representing the best operating conditions and LOS F representing the worst. Specific criteria are used to define LOS for different types of facilities as discussed below. These criteria can also vary among cities and transportation agencies.

Road Segments

Table 4.13-1 summarizes the existing LOS for the road segments based on the volume-to-capacity (V/C) ratio standards described later in Section 4.13.3.7 (Level of Service Methodology). As shown in Table 4.13-1, all road segments are currently operating at acceptable LOS C or better. Main Street between La Veta Avenue and Town & Country Road has the worst V/C ratio of 0.782 and operates at acceptable LOS C.

**TABLE 4.13-1
ROAD SEGMENT DAILY LEVELS OF SERVICE – EXISTING CONDITIONS**

ROAD SEGMENT	SECTION LIMITS	STREET CLASSIFICATION	LANE CONFIGURATION	DAILY VOLUME	CAPACITY	V/C	LOS
Main Street	La Veta Avenue to Town & Country Road	Major Arterial	6 Lanes Divided	44,050	56,300	0.782	C
	Town & Country Road to Memory Lane	Major Arterial	6 Lanes Divided	34,035	56,300	0.605	B
	Memory Lane to Edgewood Road	Major Arterial	6 Lanes Divided	36,856	56,300	0.655	B
	Edgewood Road to Santa Clara Avenue	Major Arterial	6 Lanes Divided	33,625	56,300	0.597	A
	Santa Clara Avenue to Buffalo Avenue	Major Arterial	6 Lanes Divided	38,658	56,300	0.687	B
Lawson Way	Town & Country Road to Memory Lane	Collector	2 Lanes Undivided	4,647	12,500	0.372	A
Memory Lane	Main Street to Lawson Way	Major Arterial	6 Lanes Divided	7,996	56,300	0.142	A

Source: P&D Consultants, 2007.

Ramp Segments

Table 4.13-2 summarizes the existing LOS for the ramp segments based on the V/C ratio standards described later in Section 4.13.3.7 (Level of Service Methodology). As shown in Table 4.13-2, all ramp segments are currently operating at acceptable LOS C or better. The SR 22 westbound off-ramp at La Veta Avenue has the worst A.M. peak hour V/C ratio of 0.709 and operates at acceptable LOS C.

**TABLE 4.13-2
RAMP SEGMENT LEVELS OF SERVICE – EXISTING CONDITIONS**

RAMP SEGMENT	RAMP CONDITIONS	CAPACITY	A.M. PEAK HOUR			P.M. PEAK HOUR		
			VOLUME	V/C	LOS	VOLUME	V/C	LOS
I-5 northbound off-ramp at Main Street/Edgewood Road	Non-metered One Lane	1,500	604	0.403	A	302	0.201	A
SR 22 westbound off-ramp at La Veta Avenue	Non-metered One Lane	1,500	1,064	0.709	C	759	0.506	A
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	Non-metered 1.5 Lanes	2,250	1,042	0.463	A	412	0.183	A

Source: P&D Consultants, 2007.

Signalized Intersections

Table 4.13-3 summarizes the existing LOS for the signalized intersections during the A.M. and P.M. peak hours based on the Intersection Capacity Utilization (ICU) methodology described later in Section 4.13.3.7 (Level of Service Methodology). As shown in Table 4.13-3, all signalized intersections are operating at acceptable LOS D or better. Broadway at 17th Street has the worst P.M. peak hour ICU of 0.854 and operates at acceptable LOS D. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-3
SIGNALIZED INTERSECTION LEVELS OF SERVICE – EXISTING CONDITIONS**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
1	Main Street at Chapman Avenue	0.581	A	0.654	B
2	Main Street at Palmyra Avenue	0.584	A	0.658	B
3	Main Street at Culver Avenue/Stewart Drive	0.540	A	0.643	B
4	Main Street at La Veta Avenue	0.558	A	0.651	B
5	Pepper Street at La Veta Avenue	0.526	A	0.573	A
7	Batavia Street at La Veta Avenue	0.386	A	0.433	A
8	Parker Street at La Veta Avenue	0.558	A	0.707	C
9 ^[2]	Main Street at Town & Country Road	0.379	A	0.594	A
11	Parker Street at Town & Country Road	0.415	A	0.574	A
12 ^[2]	Main Street at MainPlace Entrance/Exit	0.343	A	0.407	A
13 ^[2]	Main Street at Memory Lane	0.419	A	0.510	A
16 ^[2]	Broadway at Santa Clara Avenue	0.711	C	0.806	D
19 ^[2]	Main Street at 20 th Street	0.457	A	0.563	A
20	Broadway at 17 th Street	0.849	D	0.854	D
21	Main Street at 17 th Street	0.807	D	0.728	C

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-2.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

Signalized Intersections at Caltrans Ramps

Table 4.13-4 summarizes the existing LOS for the signalized intersections at Caltrans ramps during the A.M. and P.M. peak hours based on the HCM methodology described in Section 4.13.3.7 (Level of Service Methodology). As shown in Table 4.13-4, all signalized intersections at Caltrans ramps are operating at acceptable LOS D or better. Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue has the worst P.M. peak hour delay of 41.0 seconds per vehicle and operates at acceptable LOS D. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-4
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
EXISTING CONDITIONS**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[3]	LOS	DELAY (SEC/VEH)	LOS
6	SR 22 westbound ramps at La Veta Avenue	20.1	C	21.7	C
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	32.8	C	36.2	D
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	24.8	C	32.5	D
17 ^[2]	Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue	33.5	D	41.0	D
18 ^[2]	Main Street at I-5 southbound on-ramp/Buffalo Avenue	17.0	B	30.7	C

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-2.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[3] sec/veh: seconds per vehicle.

Unsignalized Intersections

Table 4.13-5 summarizes the existing LOS for the unsignalized intersection during the A.M. and P.M. peak hours based on the HCM methodology described later in Section 4.13.3.7 (Level of Service Methodology). As shown in Table 4.13-5, the unsignalized intersection is operating at acceptable LOS C or better. Lawson Way at Memory Lane has the worst P.M. peak hour delay of 16.6 seconds per vehicle and operates at acceptable LOS C. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-5
UNSIGNALIZED INTERSECTION LEVELS OF SERVICE – EXISTING CONDITIONS**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[5]	LOS	DELAY (SEC/VEH)	LOS
14 ^{[2],[3]}	Lawson Way at Memory Lane	12.7	B	16.6	C
22 ^[4]	Lawson Way at Jeanette Lane	Does Not Exist			

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-2.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[3] The delay for this intersection was based on the worst intersection approach control delay.

^[4] Lawson Way at Jeanette Lane would be the access point for the City Place project currently under construction and the proposed City Place Sky Lofts project.

^[5] sec/veh: seconds per vehicle.

4.13.2 THRESHOLDS OF SIGNIFICANCE RELATED TO TRANSPORTATION AND TRAFFIC

Based on Appendix G of the CEQA Guidelines, a significant transportation/traffic impact would occur if implementation of the proposed project would:

- Cause an increase in the 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).

- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment).
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

More specifically, a significant adverse traffic impact would occur in the Cities of Orange and Santa Ana if implementation of the proposed project would result in one or more of the following:

- The road segment, ramp segment or intersection that would operate at an acceptable LOS without the proposed project, but would operate at an unacceptable LOS with the proposed project.
- The road segment to operate at an unacceptable LOS, and an increase in the daily V/C ratio of greater than 0.01.
- The ramp segment to operate at an unacceptable LOS, and an increase in the hourly V/C ratio of greater than 0.03.
- The signalized intersection to operate at an unacceptable LOS, and an increase in the ICU of greater than 0.01.
- The signalized intersection at a Caltrans ramp to operate at an unacceptable LOS, and an increase in the delay of greater than one percent.
- For unsignalized intersections, the City of Santa Ana does not have any thresholds of significant adverse impacts.

4.13.3 METHODOLOGY RELATED TO TRANSPORTATION AND TRAFFIC

This section describes the procedures and methodologies used to forecast project traffic and to analyze potential project impacts on the circulation system in the study area. Topics in this section include traffic forecasting assumptions, traffic counts, trip generation, trip distributions, traffic assignment, and LOS.

4.13.3.1 Assumptions

The expected opening year for the project is 2010. The year 2030 is considered full buildout of the area. An annual ambient growth rate of one percent per year was used to forecast 2010 traffic conditions from existing traffic conditions.

4.13.3.2 Traffic Counts

P&D Consultants conducted traffic counts through a subcontract with Southland Car Counters. The detailed traffic counts are provided in Appendix H of this DEIR. The 24-hour (daily) machine counts were taken on Tuesday, April 10, 2007, at the following locations:

- Main Street just north of Town & Country Road
- Main Street just north of Memory Lane
- Main Street just north of Edgewood Road
- Main Street just north of Santa Clara Avenue
- Main Street just north of Buffalo Avenue
- Lawson Way just south of Town & Country Road

- Parker Street just north of Town & Country Road
- La Veta Avenue just east of Main Street
- La Veta Avenue just west of Parker Street
- Town & Country Road just east of Main Street
- Town & Country Road just east of Lawson Way
- Memory Lane just east of Main Street
- Memory Lane just east of Lawson Way

Intersection turning counts were conducted during both the A.M. peak period of 7:00 A.M. to 9:00 A.M. and the P.M. peak period of 4:00 P.M. to 6:00 P.M. on Tuesday, April 10, 2007, for the following intersections:

- Main Street at Chapman Avenue
- Main Street at Palmyra Avenue
- Main Street at Culver Avenue/Stewart Drive
- Main Street at La Veta Avenue
- Pepper Street at La Veta Avenue
- SR 22 westbound ramps at La Veta Avenue
- Batavia Street at La Veta Avenue
- Parker Street at La Veta Avenue
- Main Street at Town & Country Road
- SR 22 eastbound ramps/Lawson Way at Town & Country Road
- Parker Street at Town & Country Road
- Main Street at MainPlace Entrance/Exit
- Main Street at Memory Lane
- Lawson Way at Memory Lane
- Main Street at I-5 HOV ramps/I-5 northbound off-ramp/ Edgewood Road
- Broadway at Santa Clara Avenue
- Main Street at I-5 northbound on-ramp/I-5 southbound off-ramp/Santa Clara Avenue
- Main Street at I-5 southbound on-ramp/Bufalo Avenue
- Main Street at 20th Street
- Broadway at 17th Street
- Main Street at 17th Street

4.13.3.3 Future Background Traffic Volumes

Future background traffic volumes for year 2010 without the proposed project were determined by applying an ambient growth rate of one percent per year and adding cumulative project traffic. Cumulative project traffic is traffic generated by other projects that currently do not exist but which would exist when the proposed project is completed.

Future daily road segment traffic volumes for year 2030 without and with the proposed project were supplied by OCTA. The daily road segment traffic volumes for year 2030 were generated by the Orange County Transportation Analysis Model, Version 3.2 (OCTAM 3.2). OCTAM 3.2 is a regional travel demand forecasting model used for transportation planning and analysis in Orange County. OCTAM 3.2 forecasts daily traffic volumes for the year 2030 based on the circulation network on the Orange County MPAH by applying the traffic modeling processes and socioeconomic demographics data. The traffic modeling processes include trip generation, trip distribution/mode choice and traffic assignment.

OCTAM 3.2 used the Orange County Projections 2004 (OCP-2004) socioeconomic demographics. The forecasted daily traffic volumes for year 2030 are provided in Appendix H of this DEIR.

To establish the A.M. and P.M. peak hour intersection turning volumes, the OCTAM 3.2 daily traffic volumes for 2030 were post-processed according to the procedures outlined in the National Cooperative Highway Research Program (NCHRP) Report 255.

4.13.3.4 Project Trip Generation

Project trip generation is defined as the number of trips that originate or terminate at a project site. The amount of traffic generated is a function of the extent and type of land use. Trip generation is usually estimated using trip generation rates which indicate the amount of traffic generated per unit of land use. Trip generation rates for different land uses documented in the Institute of Transportation Engineers (ITE) *Trip Generation* and related publications are typically used in traffic studies. Table 4.13-6 shows the trip generation rates for a Condominiums/Townhouses land use based on the number of dwelling units.

**TABLE 4.13-6
PROJECT TRIP GENERATION RATES**

LAND USE	ITE CODE	UNIT SIZE (DU)	TRIP GENERATION RATES PER UNIT SIZE ^[1]								
			DAILY			A.M. PEAK HOUR			P.M. PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Condominiums/ Townhouse	230	1	2.93	2.93	5.86	0.07	0.37	0.44	0.35	0.17	0.52

Source: Institute of Transportation Engineers (ITE), *Trip Generation*, 7th Edition, 2003.

^[1] The average trip generation rates from *ITE Trip Generation* are used. Trip generation rates are for weekdays. A.M. and P.M. rates are peak hour rates of adjacent street traffic.

Table 4.13-7 shows the daily and A.M. and P.M. peak hour trip generations for the proposed project based on the trip generation rates listed in Table 4.13-6. As shown in Table 4.13-7, the proposed project would generate 2,080 daily trips with 156 trips occurring during the A.M. peak hour and 184 trips occurring during the P.M. peak hour.

**TABLE 4.13-7
PROJECT TRIP GENERATION**

LAND USE	ITE CODE	SIZE (DU)	TRIP GENERATION								
			DAILY			A.M. PEAK HOUR			P.M. PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Condominiums/ Townhouse	230	355	1,040	1,040	2,080	25	131	156	124	60	184

Source: P&D Consultants, 2007.

4.13.3.5 Proposed Project Trip Distribution

Project trip distribution is defined as the general directions of project-related traffic on various road segments and intersections in the study area. Trip distributions for the proposed project were based on OCTAM 3.2. The trip distribution based on OCTAM 3.2 was approximately 25 percent to the north, 30 percent to the south, 15 percent to the east, and 30 percent to the west. Figure 4.13-3 shows the proposed trip distribution for the proposed project.

4.13.3.6 Proposed Project Trip Assignment

Project trip assignment is defined as the specific routes or travel paths the project-related traffic would use based on the project trip distribution. The major factors affecting route selection are the minimum time path and minimum distance path. Often, both of these are the same. When the two paths are different, the minimum time path would usually take precedence, assuming all other factors are equal. Project trips were assigned to the road system based on the results of the trip distribution as determined in Section 4.13.3.5 (Proposed Project Trip Distribution). The results of the project trip assignment are shown on Figure 4.13-4.

4.13.3.7 Level of Service

Road Segments

For planning purposes, the Cities of Orange and Santa Ana have established maximum daily road capacities based on the road classifications as shown in Table 4.13-8. However, as shown in Table 4.13-8, the Cities of Orange and Santa Ana have different maximum daily road capacities for a Secondary Arterial. To establish consistency in this traffic study, the maximum daily road capacity for a Secondary Arterial would be 24,000 vehicles per day, which is the lower maximum daily road capacity for this road classification.

**TABLE 4.13-8
MAXIMUM AVERAGE DAILY TRAFFIC FOR ARTERIAL ROADS**

ROAD CLASSIFICATION	LANE CONFIGURATION	CITY OF ORANGE	CITY OF SANTA ANA
Principal Arterial	8 Lanes Divided	75,000	75,000
Major Arterial	6 Lanes Divided	56,300	56,300
Primary Arterial	4 Lanes Divided	37,500	37,500
Secondary Arterial	4 Lanes Undivided	24,000	25,000
Collector	2 Lanes Undivided	15,000	Not Applicable
Commuter Street	2 Lanes Undivided	Not Applicable	12,500

Sources: City of Santa Ana, *General Plan – Circulation Element*, 1998.

For City of Orange: Austin-Foust Associates, *Santiago Hills II Supplement to Final EIR 1278*.

Figure 4.13-4
Proposed Project Trip Assignment (11x17)

In this study, LOS for road segments was calculated by comparing the daily traffic volumes to the LOS E capacity ($V/C = 1.0$). This comparison yields a V/C ratio from which the LOS is determined. Table 4.13-9 shows the maximum daily road capacities for the road classifications based on the V/C ratio and corresponding LOS designation.

**TABLE 4.13-9
LEVEL OF SERVICE CRITERIA – MAXIMUM AVERAGE DAILY TRAFFIC FOR ARTERIAL ROADS**

ROAD CLASSIFICATION	LANE CONFIGURATION	LOS A ($V/C=0.6$)	LOS B ($V/C=0.7$)	LOS C ($V/C=0.8$)	LOS D ($V/C=0.9$)	LOS E ($V/C=1.0$)	LOS F ($V/C>1.0$)
Principal Arterial	8 Lanes Divided	45,000	52,500	60,000	67,500	75,000	> 75,000
Major Arterial	6 Lanes Divided	33,900	39,400	45,000	50,600	56,300	> 56,300
Primary Arterial	4 Lanes Divided	22,500	26,300	30,000	33,600	37,500	> 37,500
Secondary Arterial	4 Lanes Undivided	14,400	16,800	19,200	21,600	24,000	> 24,000
Collector	2 Lanes Undivided	7,500	8,800	10,000	11,300	12,500	> 12,500
Commuter Street	2 Lanes Undivided	7,500	8,800	10,000	11,300	12,500	> 12,500

Sources: City of Santa Ana, *General Plan – Circulation Element*, 1998.

For City of Orange: Austin-Foust Associates, *Santiago Hills II Supplement to Final EIR 1278*.

Ramp Segments

The maximum hourly ramp capacities are based on the ramp configurations. The factors affecting the on-ramp capacities include the number of merging lanes with the mainline freeway, the number of metered lanes and if a preferential HOV lane exists at the meter. The factors affecting the off-ramp capacities include the number of diverging lanes with the mainline freeway and the number of auxiliary lanes. In general, the capacity of a metered on-ramp is 900 vehicles per hour per lane (vphpl), and the capacity of a non-metered on-ramp or off-ramp is 1,500 vphpl.

In this study, LOS for ramp segments was calculated by comparing the A.M. and P.M. peak hour traffic volumes to the LOS E capacity ($V/C = 1.0$). This comparison yields a V/C ratio from which the LOS is determined. Table 4.13-10 shows the maximum hourly ramp capacities for the ramp configurations based on the V/C ratio and corresponding LOS designation.

**TABLE 4.13-10
LEVEL OF SERVICE CRITERIA – MAXIMUM HOURLY TRAFFIC FOR RAMP SEGMENTS**

RAMP CONFIGURATION	LOS A ($V/C=0.6$)	LOS B ($V/C=0.7$)	LOS C ($V/C=0.8$)	LOS D ($V/C=0.9$)	LOS E ($V/C=1.0$)	LOS F ($V/C>1.0$)
Non-Metered On-Ramps						
– One merge lane	900	1,050	1,200	1,350	1,500	> 1,500
– Two lanes that taper to one merge lane (1.5 lanes)	1,350	1,575	1,800	2,025	2,250	> 2,250
– Two merge lanes	1,800	2,100	2,400	2,700	3,000	> 3,000
Metered On-Ramps						
– One merge lane with one mixed-flow lane at the meter	540	630	720	810	900	> 900
– One merge lane with one mixed-flow lane and one HOV preferential lane at the meter (1.2 lanes)	648	756	864	972	1,080	> 1,080
– One merge lane with two mixed-flow lanes at the meter (1.5 lanes)	900	1,050	1,200	1,350	1,500	> 1,500

**TABLE 4.13-10
LEVEL OF SERVICE CRITERIA – MAXIMUM HOURLY TRAFFIC FOR RAMP SEGMENTS**

RAMP CONFIGURATION	LOS A (V/C=0.6)	LOS B (V/C=0.7)	LOS C (V/C=0.8)	LOS D (V/C=0.9)	LOS E (V/C=1.0)	LOS F (V/C>1.0)
– Two merge lanes with two mixed-flow lanes at the meter	1,080	1,260	1,440	1,620	1,800	> 1,800
Off-Ramps						
– One diverge lane	900	1,050	1,200	1,350	1,500	> 1,500
– Two diverge lanes with one auxiliary lane (1.5 lanes)	1,350	1,575	1,800	2,025	2,250	> 2,250
– Two diverge lanes with two auxiliary lanes	1,800	2,100	2,400	2,700	3,000	> 3,000

Source: Austin-Foust Associates, *City of Irvine Planning Area 1 and 9 – General Plan Amendment and Zone Change Traffic Study*, 2005.

Signalized Intersections

Signalized intersections were analyzed using the ICU methodology adopted by the Cities of Orange and Santa Ana. The ICU value is a quantitative ratio which compares intersection volume to capacity. Based on the ICU, intersection LOS is defined as shown in Table 4.13-11.

**TABLE 4.13-11
LEVEL OF SERVICE CRITERIA – SIGNALIZED INTERSECTIONS**

LOS	DESCRIPTION	ICU
A	Very low delay. Most vehicles do not stop at the intersection.	0.00 to 0.60
B	More vehicles stop than with LOS A, causing higher delays.	0.61 to 0.70
C	The number of vehicles stopping becomes significant, though many still pass through the intersection without stopping.	0.71 to 0.80
D	The influence of congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	0.81 to 0.90
E	Results in delay considered to be unacceptable.	0.91 to 1.00
F	Considered unacceptable to most drivers, often occurs with oversaturation, when arriving traffic exceeds the capacity at the intersection.	Above 1.00

Source: City of Santa Ana, *General Plan – Circulation Element*, 1998.

The ICU methodology for this study used standard parameters currently followed by the Cities of Orange and Santa Ana. These standard parameters include default saturation flow rates defined as the maximum number of vehicles that can pass through a lane per hour of green time at a signalized intersection. The parameters also include clearance interval defined as a percentage of the overall intersection capacity utilized by vehicles to clear the intersection during the amber or yellow signal. Both the Cities of Orange and Santa Ana assumed an unstriped right-turn lane exists when the distance to the inside edge of the outside through lane was at least 19 feet and parking was prohibited during the peak period. The City of Orange uses a default saturation flow rate of 1,700 vphpl for all lanes. The City of Santa Ana uses a default saturation flow rate of 1,700 vphpl for through lanes and 1,600 vphpl for turn lanes and shared through/turn lanes. To establish consistency in this traffic study, a default saturation flow rate of 1,600 vphpl was used for turn lanes and shared through/turn lanes for all intersections. A clearance interval of five percent was used for all signalized intersections.

Signalized Intersections at Caltrans Ramps

Signalized intersections at the California Department of Transportation (Caltrans) ramps were analyzed using the HCM methodology for signalized intersections. As stated earlier, the HCM established a procedure for calculating the average control delay at a signalized intersection. The LOS criteria for signalized intersections are shown in Table 4.13-12.

**TABLE 4.13-12
LEVEL OF SERVICE CRITERIA – SIGNALIZED INTERSECTIONS AT CALTRANS RAMPS**

LOS	DESCRIPTION	AVERAGE CONTROL DELAY (SEC/VEH) ^[1]
A	Very low delay. Most vehicles do not stop at the intersection.	≤ 10
B	More vehicles stop than with LOS A, causing higher delays.	>10 – 20
C	The number of vehicles stopping becomes significant, though many still pass through the intersection without stopping.	> 20 – 35
D	The influence of congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	> 35 – 55
E	Results in delay considered to be unacceptable.	> 55 – 80
F	Considered unacceptable to most drivers, often occurs with oversaturation, when arriving traffic exceeds the capacity at the intersection.	> 80

Source: Transportation Research Board, *Highway Capacity Manual*, 2000.

^[1] sec/veh: seconds per vehicle.

Unsignalized Intersections

Unsignalized intersections were analyzed using the 2000 HCM methodology for unsignalized intersections. The HCM established procedures for analyzing TWSC intersections. The LOS for TWSC intersections was determined by the computed or measured control delay and was defined for each minor movement. The LOS criteria for unsignalized intersections are shown in Table 4.13-13.

**TABLE 4.13-13
LEVEL OF SERVICE CRITERIA – UNSIGNALIZED INTERSECTIONS**

LOS	DESCRIPTION	CONTROL DELAY (SEC/VEH) ^[1]
A	Very low delay. Most vehicles do not stop at the intersection.	≤ 10
B	More vehicles stop than with LOS A, causing higher delays.	>10 – 15
C	The number of vehicles stopping becomes significant, though many still pass through the intersection without stopping.	> 15 – 25
D	The influence of congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	> 25 – 35
E	Results in delay considered to be unacceptable.	> 35 – 50
F	Considered unacceptable to most drivers, often occurs with oversaturation, when arriving traffic exceeds the capacity at the intersection.	> 50

Source: Transportation Research Board, *Highway Capacity Manual*, 2000.

^[1] sec/veh: seconds per vehicle.

4.13.3.8 Regulatory Framework

Levels of Service Standards

The Cities of Orange and Santa Ana have established LOS D or better as the acceptable LOS for road segments, ramp segments and intersections within the Cities. However, the City of Santa Ana has established LOS E or better as the acceptable LOS for intersections within a Major Development Area. The following eight intersections are within a Major Development Area. Figure 4.13-5 shows the intersections in a Major Development Area.

- Main Street at Town & Country Road
- Main Street at MainPlace Entrance/Exit
- Main Street at Memory Lane
- Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue
- Main Street at I-5 southbound on-ramp/Buffalo Avenue
- Main Street at 20th Street
- Broadway at Santa Clara Avenue
- Lawson Way at Memory Lane

For this traffic study, any road or ramp segment operating at LOS E or F was considered to be deficient. Any intersection not within a Major Development Area operating at LOS E or F was considered to be deficient, and any intersection within a Major Development Area operating at LOS F was considered to be deficient.

4.13.4 IMPACTS RELATED TO TRANSPORTATION AND TRAFFIC

4.13.4.1 2010 Traffic Conditions

Circulation Network

Several improvements to the circulation network would occur between 2007 and 2010. Tables 4.13-14 and 4.13-15 summarize the planned improvements to the road segments and intersections, respectively. As shown in Tables 4.13-14 and 4.13-15, all of the circulation improvements in the study area are completely funded except for the road segment of Lawson Way between Town & Country Road and Memory Lane and the intersection of Main Street at La Veta Avenue. The completely funded circulation improvements in the study area were assumed to exist in 2010. Figure 4.13-6 shows the circulation network in 2010 with the completely funded planned improvements.

Figure 4.13-5
City of Santa Ana
Major Development Areas (8.5x11)

**TABLE 4.13-14
ROAD SEGMENT PLANNED IMPROVEMENTS – 2010**

ROAD SEGMENT	SECTION LIMITS	PLANNED IMPROVEMENT	COMPLETELY FUNDED?
Main Street	Chapman Avenue to Palmyra Avenue	– Add one northbound and southbound lane.	Yes
Main Street	Palmyra Avenue to Culver Avenue/Stewart Drive	– Add one northbound and southbound lane.	Yes
Main Street	Culver Avenue/Stewart Drive to La Veta Avenue	– Add one southbound lane.	Yes
Main Street	Buffalo Avenue to 17 th Street	– Add one northbound lane.	Yes
Lawson Way	Town &Country Road to Memory Lane	– Add one northbound and southbound lane.	No

Sources: City of Orange, 2007 and City of Santa Ana, 2007.

**TABLE 4.13-15
INTERSECTION PLANNED IMPROVEMENTS – 2010**

INDEX ^[1]	INTERSECTION	PLANNED IMPROVEMENT	COMPLETELY FUNDED?
10	Main Street at La Veta Avenue	– Add one northbound through lane.	No
12	Main Street at MainPlace Entrance/Exit	– Add one northbound unstriped right-turn lane. – Add one southbound left-turn lane. – Add one westbound shared through/left-turn lane. – Add one westbound right-turn lane. – Convert one eastbound right-turn lane to one shared through/right-turn lane.	Yes
14	Lawson Way at Memory Lane	– Signalize the intersection.	Yes
20	Broadway at 17 th Street	– Add one southbound right-turn lane.	Yes
21	Main Street at 17 th Street	– Add one southbound right-turn lane.	Yes
22	Lawson Way at Jeanette Lane	– Install Stop sign on eastbound approach. – TWLTL median on Lawson Way would function as one northbound left-turn lane. – Convert one southbound through lane to one shared through/right-turn lane. – Add one eastbound shared left-/right-turn lane.	Yes

Sources: City of Orange, 2007 and City of Santa Ana, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-6.

Traffic Volumes

Traffic volumes for 2010 without the proposed project were calculated by applying an ambient growth rate of one percent per year to the existing traffic volumes and adding cumulative project traffic as discussed in Section 4.13.3.3 (Future Background Traffic Volumes). The following cumulative projects were analyzed:

- A. One Broadway Plaza
- B. Santa Ana Renaissance Specific Plan
- C. Artists Village Live/Work Lofts
- D. Santiago Street Lofts
- E. Westend Lofts

Figure 4.13-6
Circulation Network – 2010 (11x17)

- F. City Place
- G. Discovery Science Center
- H. Bower's Museum Expansion
- I. Cordoba
- J. Walgreens
- K. Cobblestone Plaza
- L. Civic Center Office
- M. Shea Homes
- N. Village Green
- O. Town and Country Manor Retirement Center
- P. Greystone Homes
- Q. River View Villas
- R. Citadel Medical Office Building
- S. St. Joseph Hospital Expansion
- T. CHOC Hospital Expansion
- U. Town and Country Medical Office Building

Figures 4.13-7 and 4.13-8 show the locations of the cumulative projects and the total cumulative project traffic, respectively. Figures 4.13-9 and 4.13-10 show the traffic volumes in 2010 without and with the proposed project, respectively.

4.13.4.2 2010 Traffic Impact Analysis

Project-related traffic impacts were determined by comparing the road segment, ramp segment and intersection LOS without and with the proposed project. Significant adverse traffic impacts were identified based on the City of Orange's and the City of Santa Ana's criteria for significant adverse project impacts previously described in Section 4.13.2 (Thresholds of Significance Related to Transportation and Traffic).

Road Segments

Table 4.13-16 summarizes the LOS for the road segments in 2010 without the proposed project. As shown in Table 4.13-16, all road segments would operate at acceptable LOS D or better except for Main Street between La Veta Avenue and Town & Country Road. Main Street between La Veta Avenue and Town & Country Road would have the worst V/C ratio of 0.954 and would operate at an unacceptable LOS E in 2010 without the proposed project.

Table 4.13-17 summarizes the LOS for the road segments in 2010 with the proposed project. As shown in Table 4.13-17, all road segments would operate at acceptable LOS D or better except for Main Street between La Veta Avenue and Town & Country Road. Main Street between La Veta Avenue and Town & Country Road would have the worst V/C ratio of 0.964 and would operate at an unacceptable LOS E in 2010 with the proposed project.

Figure 4.13-7
Cumulative Projects Map (8.5 x 11)

Figure 4.13-8
Traffic Volumes – Cumulative Projects (11x17)

Figure 4.13-9
Traffic Volumes – 2010 without Project (11x17)

Figure 4.13-10
Traffic Volumes – 2010 with Project (11x17)

**TABLE 4.13-16
ROAD SEGMENT DAILY LEVELS OF SERVICE – 2010 WITHOUT THE PROJECT^[1]**

ROAD SEGMENT	SECTION LIMITS	STREET CLASSIFICATION	LANE CONFIGURATION	DAILY VOLUME	CAPACITY	V/C	LOS
Main Street	La Veta Avenue to Town & Country Road	Major Arterial	6 Lanes Divided	53,719	56,300	0.954	E
	Town & Country Road to Memory Lane	Major Arterial	6 Lanes Divided	41,642	56,300	0.740	C
	Memory Lane to Edgewood Road	Major Arterial	6 Lanes Divided	46,512	56,300	0.826	D
	Edgewood Road to Santa Clara Avenue	Major Arterial	6 Lanes Divided	41,875	56,300	0.744	C
	Santa Clara Avenue to Buffalo Avenue	Major Arterial	6 Lanes Divided	46,458	56,300	0.825	D
Lawson Way	Town & Country Road to Memory Lane	Collector	2 Lanes Undivided	6,125	12,500	0.490	A
Memory Lane	Main Street to Lawson Way	Major Arterial	6 Lanes Divided	9,838	56,300	0.175	A

Source: P&D Consultants, 2007. **Bolded** items indicate road segment, these would operate at below-standard LOS.

^[1] 2010 without the Project includes existing traffic, ambient growth and cumulative projects traffic, but without the proposed City Place Sky Lofts project traffic.

**TABLE 4.13-17
ROAD SEGMENT DAILY LEVELS OF SERVICE – 2010 WITH THE PROJECT^[1]**

ROAD SEGMENT	SECTION LIMITS	STREET CLASSIFICATION	LANE CONFIGURATION	DAILY VOLUME	CAPACITY	V/C	LOS
Main Street	La Veta Avenue to Town & Country Road	Major Arterial	6 Lanes Divided	54,280	56,300	0.964	E
	Town & Country Road to Memory Lane	Major Arterial	6 Lanes Divided	41,642	56,300	0.740	C
	Memory Lane to Edgewood Road	Major Arterial	6 Lanes Divided	47,136	56,300	0.837	D
	Edgewood Road to Santa Clara Avenue	Major Arterial	6 Lanes Divided	42,395	56,300	0.753	C
	Santa Clara Avenue to Buffalo Avenue	Major Arterial	6 Lanes Divided	46,874	56,300	0.833	D
Lawson Way	Town & Country Road to Memory Lane	Collector	2 Lanes Undivided	7,477	12,500	0.598	A
Memory Lane	Main Street to Lawson Way	Major Arterial	6 Lanes Divided	10,566	56,300	0.188	A

Source: P&D Consultants, 2007. **Bolded** items indicate the road segment would operate at below-standard LOS.

^[1] 2010 with the Project includes existing traffic, ambient growth and cumulative projects traffic, and the proposed City Place Sky Lofts project traffic.

Table 4.13-18 summarizes the road segment changes in the daily V/C ratio, identifies if the road segment would be operating at an unacceptable LOS, and if the road segment would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-18, implementation of the proposed project would create a significant adverse impact to Main Street between La Veta Avenue and Town & Country Road because this road segment would operate at an unacceptable LOS and with an increase of the V/C ratio of greater than 0.01. Mitigation measures for this road segment are discussed in Section 4.13.5 (Mitigation Related to Transportation and Traffic).

**TABLE 4.13-18
ROAD SEGMENT SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

ROAD SEGMENT	SECTION LIMITS	CHANGE IN V/C	UNACCEPTABLE LOS?	SIGNIFICANT ADVERSE IMPACT?
Main Street	La Veta Avenue to Town & Country Road	0.010	Yes	Yes
	Town & Country Road to Memory Lane	0.000	No	No
	Memory Lane to Edgewood Road	0.011	No	No
	Edgewood Road to Santa Clara Avenue	0.009	No	No
	Santa Clara Avenue to Buffalo Avenue	0.008	No	No
Lawson Way	Town & Country Road to Memory Lane	0.108	No	No
Memory Lane	Main Street to Lawson Way	0.013	No	No

Source: P&D Consultants, 2007. **Bolded** items indicate implementation of the proposed project would create a significant adverse impact to the road segment.

Implementation of the proposed project would not create a significant adverse impact to the other six road segments because the road segments would operate at an acceptable LOS in 2010 with the proposed project. The V/C ratio for Main Street between Town & Country Road to Memory Lane did not increase because the proposed project would not add traffic to the road segment.

Ramp Segments

Table 4.13-19 summarizes the LOS for the ramp segments in 2010 without the proposed project. As shown in Table 4.13-19, all ramp segments would operate at acceptable LOS D or better. The SR 22 westbound off-ramp at La Veta Avenue has the worst A.M. peak hour V/C ratio of 0.878 and would operate at acceptable LOS D in 2010 without the proposed project.

Table 4.13-20 summarizes the LOS for the ramp segments in 2010 with the proposed project. As shown in Table 4.13-20, all ramp segments would operate at acceptable LOS D or better. The SR 22 westbound off-ramp at La Veta Avenue has the worst A.M. peak hour V/C ratio of 0.881 and would operate at acceptable LOS D in 2010 with the proposed project.

**TABLE 4.13-19
RAMP SEGMENT LEVELS OF SERVICE – 2010 WITHOUT THE PROJECT^[1]**

RAMP SEGMENT	RAMP CONDITIONS	CAPACITY	A.M. PEAK HOUR			P.M. PEAK HOUR		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5 northbound off-ramp at Main Street/Edgewood Road	Non-metered One Lane	1,500	712	0.475	A	399	0.266	A
SR 22 westbound off-ramp at La Veta Avenue	Non-metered One Lane	1,500	1,317	0.878	D	925	0.617	B
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	Non-metered 1.5 Lanes	2,250	1,190	0.529	A	551	0.245	A

Source: P&D Consultants, 2007.

^[1] 2010 without the Project includes existing traffic, ambient growth, cumulative projects traffic, but without the proposed City Place Sky Lofts project traffic.

**TABLE 4.13-20
RAMP SEGMENT LEVELS OF SERVICE – 2010 WITH THE PROJECT^[1]**

RAMP SEGMENT	RAMP CONDITIONS	CAPACITY	A.M. PEAK HOUR			P.M. PEAK HOUR		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5 northbound off-ramp at Main Street/Edgewood Road	Non-metered One Lane	1,500	715	0.477	A	411	0.274	A
SR 22 westbound off-ramp at La Veta Avenue	Non-metered One Lane	1,500	1,322	0.881	D	950	0.633	B
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	Non-metered 1.5 Lanes	2,250	1,195	0.531	C	576	0.256	A

Source: P&D Consultants, 2007.

^[1] 2010 with the Project includes existing traffic, ambient growth, cumulative projects traffic, and the proposed City Place Sky Lofts project traffic.

Table 4.13-21 summarizes the ramp segment changes in the peak hour V/C ratio, identifies if the ramp segment would be operating at an unacceptable LOS, and if the ramp segment would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-21, all ramp segments would operate at an acceptable LOS in 2010 with the proposed project. Therefore, implementation of the proposed project would not create a significant adverse impact to the ramps segments.

**TABLE 4.13-21
RAMP SEGMENT SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

RAMP SEGMENT	A.M. Peak Hour			P.M. Peak Hour		
	Change in V/C	Unacc. LOS? ^[1]	Sig. Adv. Imp.? ^[2]	Change in V/C	Unacc. LOS?	Sig. Adv. Imp.?
I-5 northbound off-ramp at Main Street/Edgewood Road	0.002	No	No	0.008	No	No
SR 22 westbound off-ramp at La Veta Avenue	0.003	No	No	0.016	No	No
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	0.002	No	No	0.011	No	No

Source: P&D Consultants, 2007.

^[1] Unacc. LOS: Unacceptable LOS.

^[2] Sig. Adv. Imp.: Significant Adverse Impact.

Signalized Intersections

Table 4.13-22 summarizes the LOS for the signalized intersection in 2010 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-22, all signalized intersections would operate at an acceptable LOS except for the intersection of Broadway at 17th Street during the A.M. peak hour. Broadway at 17th Street has an ICU of 0.901 and would operate at unacceptable LOS E during the A.M. peak hour in 2010 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

TABLE 4.13-22
SIGNALIZED INTERSECTION LEVELS OF SERVICE – 2010 WITHOUT THE PROJECT⁽¹⁾

INDEX ⁽²⁾	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
1	Main Street at Chapman Avenue	0.665	B	0.710	C
2	Main Street at Palmyra Avenue	0.647	B	0.736	C
3	Main Street at Culver Avenue/Stewart Drive	0.617	B	0.814	D
4	Main Street at La Veta Avenue	0.652	B	0.780	C
5	Pepper Street at La Veta Avenue	0.698	B	0.893	D
7	Batavia Street at La Veta Avenue	0.406	A	0.452	A
8	Parker Street at La Veta Avenue	0.605	B	0.796	C
9 ⁽³⁾	Main Street at Town & Country Road	0.451	A	0.693	B
11	Parker Street at Town & Country Road	0.430	A	0.611	B
12 ⁽³⁾	Main Street at MainPlace Entrance/Exit	0.382	A	0.504	A
13 ⁽³⁾	Main Street at Memory Lane	0.568	A	0.606	B
14 ⁽³⁾	Lawson Way at Memory Lane	0.327	A	0.382	A
16 ⁽³⁾	Broadway at Santa Clara Avenue	0.639	B	0.788	C
19 ⁽³⁾	Main Street at 20 th Street	0.527	A	0.634	B
20	Broadway at 17 th Street	0.901	E	0.859	D
21	Main Street at 17 th Street	0.847	D	0.808	D

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

⁽¹⁾ 2010 without the Project includes existing traffic, ambient growth and cumulative projects traffic, but without the proposed City Place Sky Lofts project traffic.

⁽²⁾ The index refers to intersections as they are numbered on Figure 4.3-10.

⁽³⁾ The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

Table 4.13-23 summarizes the LOS for the signalized intersection in 2010 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-23, all signalized intersections would operate at an acceptable LOS except for the intersection of Broadway at 17th Street during the A.M. peak hour. Broadway at 17th Street has an ICU of 0.903 and would operate at unacceptable LOS E during the A.M. peak hour in 2010 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-23
SIGNALIZED INTERSECTION LEVELS OF SERVICE – 2010 WITH THE PROJECT^[1]**

INDEX ^[2]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
1	Main Street at Chapman Avenue	0.668	B	0.716	C
2	Main Street at Palmyra Avenue	0.649	B	0.740	C
3	Main Street at Culver Avenue/Stewart Drive	0.618	B	0.817	D
4	Main Street at La Veta Avenue	0.659	B	0.789	C
5	Pepper Street at La Veta Avenue	0.698	B	0.894	D
7	Batavia Street at La Veta Avenue	0.409	A	0.454	A
8	Parker Street at La Veta Avenue	0.619	B	0.811	D
9 ^[2]	Main Street at Town & Country Road	0.452	A	0.702	C
11	Parker Street at Town & Country Road	0.438	A	0.616	B
12 ^[2]	Main Street at MainPlace Entrance/Exit	0.382	A	0.504	A
13 ^[2]	Main Street at Memory Lane	0.569	A	0.612	B
14 ^[2]	Lawson Way at Memory Lane	0.362	A	0.422	A
16 ^[2]	Broadway at Santa Clara Avenue	0.641	B	0.792	C
19 ^[2]	Main Street at 20 th Street	0.533	A	0.640	B
20	Broadway at 17 th Street	0.903	E	0.862	D
21	Main Street at 17 th Street	0.849	D	0.813	D

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

^[1] 2010 with the Project includes existing traffic, ambient growth, cumulative projects traffic, and the proposed City Place Sky Lofts project traffic.

^[2] The index refers to intersections as they are numbered on Figure 4.3-10.

^[3] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

Table 4.13-24 summarizes the signalized intersection changes in ICU, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-24, implementation of the proposed project would not create a significant adverse impact to the signalized intersections. Even though the intersection of Broadway at 17th Street would operate at an unacceptable LOS during the A.M. peak hour, implementation of the proposed project would not create a significant adverse impact because the increase in ICU is less than 0.01. The remaining intersections would operate at an acceptable LOS in 2010 with the proposed project.

The ICU for the intersection of Pepper Street at La Veta Avenue during the A.M. peak hour did not increase because the proposed project traffic was added to the non-critical movements at the intersection. The ICU for the intersection of Main Street at Westfield MainPlace Entrance/Exit did not increase because the proposed project would not add traffic to this intersection.

**TABLE 4.13-24
SIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN ICU	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	CHANGE IN ICU	UNACC. LOS?	SIG. ADV. IMP.?
1	Main Street at Chapman Avenue	0.003	No	No	0.006	No	No
2	Main Street at Palmyra Avenue	0.002	No	No	0.004	No	No
3	Main Street at Culver Avenue/Stewart Drive	0.001	No	No	0.003	No	No
4	Main Street at La Veta Avenue	0.007	No	No	0.009	No	No
5	Pepper Street at La Veta Avenue	0.000	No	No	0.001	No	No
7	Batavia Street at La Veta Avenue	0.003	No	No	0.002	No	No
8	Parker Street at La Veta Avenue	0.014	No	No	0.015	No	No

**TABLE 4.13-24
SIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN ICU	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	CHANGE IN ICU	UNACC. LOS?	SIG. ADV. IMP.?
9	Main Street at Town & Country Road	0.001	No	No	0.009	No	No
11	Parker Street at Town & Country Road	0.008	No	No	0.005	No	No
12	Main Street at MainPlace Entrance/Exit	0.000	No	No	0.000	No	No
13	Main Street at Memory Lane	0.001	No	No	0.006	No	No
14	Lawson Way at Memory Lane	0.035	No	No	0.040	No	No
16	Broadway at Santa Clara Avenue	0.002	No	No	0.004	No	No
19	Main Street at 20 th Street	0.006	No	No	0.006	No	No
20	Broadway at 17 th Street	0.002	Yes	No	0.003	No	No
21	Main Street at 17 th Street	0.002	No	No	0.005	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to intersections as they are numbered on Figure 4.3-10.

^[2] Unacc. LOS: Unacceptable LOS.

^[3] Sig. Adv. Imp.: Significant Adverse Impact.

Signalized Intersections at Caltrans Ramps

Table 4.13-25 summarizes the LOS for the signalized intersection at Caltrans ramps in 2010 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-25, all signalized intersections at Caltrans ramps would operate at an acceptable LOS. Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue has the worst P.M. peak hour delay of 65.5 seconds per vehicle and would operate at acceptable LOS E in 2010 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-25
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
2010 WITHOUT THE PROJECT^[1]**

INDEX ^[2]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		Delay (sec/veh) ^[4]	LOS	Delay (sec/veh)	LOS
6	SR 22 westbound ramps at La Veta Avenue	20.7	C	23.7	C
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	33.4	C	38.7	D
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	25.7	C	35.2	C
17 ^[3]	Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue	37.9	D	65.5	E
18 ^[3]	Main Street at I-5 southbound on-ramp/Buffalo Avenue	16.9	B	41.3	D

Source: P&D Consultants, 2007.

^[1] 2010 without the Project includes existing traffic, ambient growth and cumulative projects traffic, but without the proposed City Place Sky Lofts project traffic.

^[2] The index refers to intersections as they are numbered on Figure 4.3-10.

^[3] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[4] sec/veh: seconds per vehicle.

Table 4.13-26 summarizes the LOS for the signalized intersection at Caltrans ramps in 2010 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-26, all signalized intersections at Caltrans ramps would operate at an acceptable LOS. Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue has the worst P.M. peak hour delay of 65.8 seconds per vehicle and would operate at acceptable LOS E in 2010 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-26
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
2010 WITH THE PROJECT^[1]**

INDEX ^[2]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (sec/veh) ^[4]	LOS	DELAY (sec/veh)	LOS
6	SR 22 westbound ramps at La Veta Avenue	20.9	C	23.8	C
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	33.6	C	39.7	D
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	25.6	C	35.2	C
17 ^[3]	Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue	38.2	D	65.8	E
18 ^[3]	Main Street at I-5 southbound on-ramp/Buffalo Avenue	16.9	B	42.3	D

Source: P&D Consultants, 2007.

^[1] 2010 with the Project includes existing traffic, ambient growth, cumulative projects traffic, and the proposed City Place Sky Lofts project traffic.

^[2] The index refers to intersections as they are numbered on Figure 4.3-10.

^[3] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[4] sec/veh: seconds per vehicle.

Table 4.13-27 summarizes the percent change in delay for the signalized intersections at Caltrans ramps, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-27, all signalized intersections at Caltrans ramps would operate at an acceptable LOS in 2010 with the proposed project. Therefore, implementation of the proposed project would not create a significant adverse impact to the signalized intersections at Caltrans ramps.

The average delay per vehicle at the intersection of Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road decreased during the A.M. peak hour because proposed project traffic was added to the non-critical movements at the intersection. When traffic is added to the non-critical movements at an intersection, the average delay per vehicle decreases even though the sum of the delay for all vehicles at the intersection increases.

**TABLE 4.13-27
SIGNALIZED INTERSECTION AT CALTRANS RAMPS
SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		PERCENT CHANGE IN DELAY	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	PERCENT CHANGE IN DELAY	UNACC. LOS?	SIG. ADV. IMP.?
6	SR 22 westbound ramps at La Veta Avenue	0.9%	No	No	0.4%	No	No
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	0.6%	No	No	2.6%	No	No
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	- 0.4%	No	No	0.0%	No	No
17	Main Street at I-5 northbound on-ramp and southbound off-ramp/ Santa Clara Avenue	0.8%	No	No	0.5%	No	No
18	Main Street at I-5 southbound on-ramp/Buffalo Avenue	0.0%	No	No	2.4%	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to intersections as they are numbered on Figure 4.3-10.

^[2] Unacc. LOS: Unacceptable LOS.

^[3] Sig. Adv. Imp.: Significant Adverse Impact.

Unsignalized Intersections

Table 4.13-28 summarizes the LOS for the unsignalized intersection in 2010 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-28, the unsignalized intersection would operate at acceptable LOS B or better. Lawson Way at Jeanette Lane has the worst P.M. peak hour delay of 10.1 seconds per vehicle and would operate at acceptable LOS B in 2010 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-28
UNSIGNALIZED INTERSECTION LEVELS OF SERVICE – 2010 WITHOUT THE PROJECT^[1]**

INDEX ^[2]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		Delay (sec/veh) ^[4]	LOS	Delay (sec/veh)	LOS
22 ^[3]	Lawson Way at Jeanette Lane	9.9	A	10.1	B

Source: P&D Consultants, 2007.

^[1] 2010 without the Project includes existing traffic, ambient growth and cumulative projects traffic, but without the proposed City Place Sky Lofts project traffic.

^[2] The index refers to intersections as they are numbered on Figure 4.3-10.

^[3] The delay for this intersection was based on the worst intersection approach control delay.

^[4] sec/veh: seconds per vehicle.

Table 4.13-29 summarizes the LOS for the unsignalized intersection in 2010 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-29, the unsignalized intersection would operate at acceptable LOS B. Lawson Way at Jeanette Lane has the worst P.M. peak hour delay of 11.5 seconds per vehicle and would operate at acceptable LOS B in 2010 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-29
UNSIGNALIZED INTERSECTION LEVELS OF SERVICE – 2010 WITH THE PROJECT^[1]**

INDEX ^[2]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[4]	LOS	DELAY (SEC/VEH)	LOS
22 ^[3]	Lawson Way at Jeanette Lane	11.3	B	11.5	B

Source: P&D Consultants, 2007.

^[1] 2010 with the Project includes existing traffic, ambient growth, cumulative projects traffic, and the proposed City Place Sky Lofts project traffic.

^[2] The index refers to intersections as they are numbered on Figure 4.3-10.

^[3] The delay for this intersection was based on the worst intersection approach control delay.

^[4] sec/veh: seconds per vehicle.

Table 4.13-30 summarizes the changes in delay for the unsignalized intersection, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-30, the unsignalized intersection would operate at an acceptable LOS in 2010 with the proposed project. Therefore, implementation of the proposed project would not create at significant adverse impact to the unsignalized intersection.

**TABLE 4.13-30
UNSIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY – 2010**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN DELAY (SEC/VEH) ^[2]	UNACC. LOS? ^[3]	SIG. ADV. IMP.? ^[4]	CHANGE IN DELAY (SEC/VEH)	UNACC. LOS?	SIG. ADV. IMP.?
22	Lawson Way at Jeanette Lane	1.4	No	No	1.4	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to intersections as they are numbered on Figure 4.3-10.

^[2] sec/veh: seconds per vehicle.

^[3] Unacc. LOS: Unacceptable LOS.

^[4] Sig. Adv. Imp.: Significant Adverse Impact.

4.13.4.3 2030 Traffic Conditions

Circulation Network

Several improvements to the circulation network would occur between 2010 and 2030. The year 2030 assumes buildout conditions for the MPAH. However, Main Street between Buffalo Avenue and 17th Street would only be improved to three northbound and two southbound through lanes, even though this road segment is designated as a Major Arterial on the MPAH with three through lanes in each direction and a raised median.¹ Implementation of this improvement was deemed infeasible because it would require the acquisition of additional right-of-way with the possibility of demolition and/or modification to existing buildings. Tables 4.13-31 and 4.13-32 summarize the planned improvements to the road segments and intersections, respectively. Figure 4.13-11 shows the circulation network in 2030.

¹ P&D Consultants, Inc., One Broadway Plaza Traffic Impact Study, 2002.

Figure 4.13-11
Circulation Network – 2030 (11x17)

**TABLE 4.13-31
ROAD SEGMENT PLANNED IMPROVEMENTS – 2030**

ROAD SEGMENT	SECTION LIMITS	PLANNED IMPROVEMENT
La Veta Avenue	Batavia Street to Parker Street	– Add one eastbound and westbound lane.
Lawson Way	Town & Country Road to Memory Lane	– Add one northbound and southbound lane.
Parker Street	La Veta Avenue to Town & Country Road	– Add one northbound and southbound lane.
Parker Street	Town & Country Road to City of Orange boundary limit	– Add one northbound and southbound lane.

Sources: Austin-Foust Associates, Inc., *Saint Joseph Hospital Expansion Traffic Study*, 2003 and Orange County Transportation Authority, 2007.

**TABLE 4.13-32
INTERSECTION PLANNED IMPROVEMENTS – 2030**

INDEX^[1]	INTERSECTION	PLANNED IMPROVEMENT
1	Main Street at Chapman Avenue	– Add one northbound, southbound and eastbound through lane. – Add one southbound and eastbound left-turn lane.
2	Main Street at Palmyra Avenue	– Add one northbound and southbound through lane.
3	Main Street at Culver Avenue/ Stewart Drive	– Add one northbound and southbound through lane.
4	Main Street at La Veta Avenue	– Add one northbound through lane. – Convert one eastbound right-turn lane to one shared through/ right-turn lane.
8	Parker Street at La Veta Avenue	– Add one eastbound and westbound through lane. – Add one eastbound unstriped right-turn lane.
11	Parker Street at Town & Country Road	– Convert one northbound and southbound unstriped right-turn lane to one shared through/right-turn lane.

Sources: Austin-Foust Associates, Inc., *Saint Joseph Hospital Expansion Traffic Study*, 2003 and City of Orange, *Orange General Plan*, 2005.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-11.

Traffic Volumes

As discussed in Section 4.13.3.3 (Future Background Traffic Volumes), OCTA provided the 2030 daily traffic volumes generated by OCTAM 3.2. The 2030 daily traffic volumes were post-processed from OCTAM 3.2 according to the procedures outlined in the NCHRP Report 255 to obtain the A.M. and P.M. peak hour intersection turning volumes. Figures 4.13-12 and 4.13-13 show the traffic volumes in 2030 without and with the proposed project, respectively.

4.13.4.4 2030 Traffic Impact Analysis

Project-related traffic impacts were determined by comparing the road segment, ramp segment and intersection LOS without and with the proposed project. Significant adverse traffic impacts were identified based on the City of Orange's and the City of Santa Ana's criteria for significant adverse project impacts previously described in Section 4.13.2 (Thresholds of Significance Related to Transportation and Traffic).

Figure 4.13-12
Traffic Volumes – 2030 without Project (11x17)

Figure 4.13-13
Traffic Volumes – 2030 with Project (11x17)

Road Segments

Table 4.13-33 summarizes the LOS the road segments in 2030 without the proposed project. As shown in Table 4.13-33, all road segments would operate at acceptable LOS D or better except for Main Street between Town & Country Road and Memory Lane. Main Street between Town & Country Road and Memory Lane would have the worst V/C ratio of 0.925 and would operate at an unacceptable LOS E in 2030 without the proposed project.

**TABLE 4.13-33
ROAD SEGMENT DAILY LEVELS OF SERVICE – 2030 WITHOUT THE PROJECT**

ROAD SEGMENT	SECTION LIMITS	STREET CLASSIFICATION	LANE CONFIGURATION	DAILY VOLUME	CAPACITY	V/C	LOS
Main Street	La Veta Avenue to Town & Country Road	Major Arterial	6 Lanes Divided	49,338	56,300	0.876	D
	Town & Country Road to Memory Lane	Major Arterial	6 Lanes Divided	52,100	56,300	0.925	E
	Memory Lane to Edgewood Road	Major Arterial	6 Lanes Divided	34,576	56,300	0.614	B
	Edgewood Road to Santa Clara Avenue	Major Arterial	6 Lanes Divided	34,880	56,300	0.620	B
	Santa Clara Avenue to Buffalo Avenue	Major Arterial	6 Lanes Divided	33,484	56,300	0.595	A
Lawson Way	Town & Country Road to Memory Lane	Secondary Arterial	4 Lanes Undivided	16,448	24,000	0.685	B
Memory Lane	Main Street to Lawson Way	Major Arterial	6 Lanes Divided	11,572	56,300	0.206	A

Source: P&D Consultants, 2007. **Bolded** items indicate road segment would operate at below-standard LOS.

Table 4.13-34 summarizes the LOS for the road segments in 2030 with the proposed project. As shown in Table 4.13-34, all road segments would operate at acceptable LOS D or better except for Main Street between Town & Country Road and Memory Lane. Main Street between Town & Country Road and Memory Lane would have the worst V/C ratio of 0.925 and would operate at an unacceptable LOS E in 2030 with the proposed project.

**TABLE 4.13-34
ROAD SEGMENT DAILY LEVELS OF SERVICE – 2030 WITH THE PROJECT**

ROAD SEGMENT	SECTION LIMITS	STREET CLASSIFICATION	LANE CONFIGURATION	DAILY VOLUME	CAPACITY	V/C	LOS
Main Street	La Veta Avenue to Town & Country Road	Major Arterial	6 Lanes Divided	49,900	56,300	0.886	D
	Town & Country Road to Memory Lane	Major Arterial	6 Lanes Divided	52,100	56,300	0.925	E
	Memory Lane to Edgewood Road	Major Arterial	6 Lanes Divided	35,200	56,300	0.625	B
	Edgewood Road to Santa Clara Avenue	Major Arterial	6 Lanes Divided	35,400	56,300	0.629	B
	Santa Clara Avenue to Buffalo Avenue	Major Arterial	6 Lanes Divided	33,900	56,300	0.602	B
Lawson Way	Town & Country Road to Memory Lane	Secondary Arterial	4 Lanes Undivided	17,800	24,000	0.742	C
Memory Lane	Main Street to Lawson Way	Major Arterial	6 Lanes Divided	12,300	56,300	0.218	A

Source: P&D Consultants, 2007. **Bolded** items indicate road segment would operate at below-standard LOS.

Table 4.13-35 summarizes the road segment changes in the daily V/C ratio, identifies if the road segment would be operating at an unacceptable LOS, and if the road segment would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-35, implementation of the proposed project would not create a significant adverse impact to the road segments. Even though Main Street between Town & Country Road at Memory Lane would operate at an unacceptable LOS, implementation of the proposed project would not create a significant adverse impact because the proposed project would not add traffic to this road segment.

**TABLE 4.13-35
ROAD SEGMENT SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

ROAD SEGMENT	SECTION LIMITS	CHANGE IN V/C	UNACCEPTABLE LOS?	SIGNIFICANT ADVERSE IMPACT?
Main Street	La Veta Avenue to Town & Country Road	0.010	No	No
	Town & Country Road to Memory Lane	0.000	Yes	No
	Memory Lane to Edgewood Road	0.011	No	No
	Edgewood Road to Santa Clara Avenue	0.009	No	No
	Santa Clara Avenue to Buffalo Avenue	0.007	No	No

**TABLE 4.13-35
ROAD SEGMENT SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

ROAD SEGMENT	SECTION LIMITS	CHANGE IN V/C	UNACCEPTABLE LOS?	SIGNIFICANT ADVERSE IMPACT?
Lawson Way	Town & Country Road to Memory Lane	0.057	No	No
Memory Lane	Main Street to Lawson Way	0.012	No	No

Source: P&D Consultants, 2007.

Ramp Segments

Table 4.13-36 summarizes the LOS for the ramp segments in 2030 without the proposed project. As shown in Table 4.13-36, all ramp segments would operate at acceptable LOS C or better. The SR 22 westbound off-ramp at La Veta Avenue has the worst A.M. peak hour V/C ratio 0.783 and would operate at acceptable LOS D in 2030 without the proposed project.

**TABLE 4.13-36
RAMP SEGMENT LEVELS OF SERVICE – 2030 WITHOUT THE PROJECT**

RAMP SEGMENT	RAMP CONDITIONS	CAPACITY	A.M. PEAK HOUR			P.M. PEAK HOUR		
			Volume	V/C	LOS	Volume	V/C	LOS
I-5 northbound off-ramp at Main Street/Edgewood Road	Non-metered One Lane	1,500	527	0.351	A	858	0.572	A
SR 22 westbound off-ramp at La Veta Avenue	Non-metered One Lane	1,500	1,175	0.783	C	745	0.497	A
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	Non-metered 1.5 Lanes	2,250	1,730	0.769	C	705	0.313	A

Source: P&D Consultants, 2007.

Table 4.13-37 summarizes the LOS for the ramp segments in 2030 with the proposed project. As shown in Table 4.13-37, all ramp segments would operate at acceptable LOS C or better. The SR 22 westbound off-ramp at La Veta Avenue has the worst A.M. peak hour V/C ratio of 0.787 and would operate at acceptable LOS C in 2030 with the proposed project.

**TABLE 4.13-37
RAMP SEGMENT LEVELS OF SERVICE – 2030 WITH THE PROJECT**

RAMP SEGMENT	RAMP CONDITIONS	CAPACITY	A.M. PEAK HOUR			P.M. PEAK HOUR		
			VOLUME	V/C	LOS	VOLUME	V/C	LOS
I-5 northbound off-ramp at Main Street/Edgewood Road	Non-metered One Lane	1,500	530	0.353	A	870	0.580	A
SR 22 westbound off-ramp at La Veta Avenue	Non-metered One Lane	1,500	1,180	0.787	C	770	0.513	A
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	Non-metered 1.5 Lanes	2,250	1,735	0.771	C	730	0.324	A

Source: P&D Consultants, 2007.

Table 4.13-38 summarizes the ramp segment changes in the peak hour V/C ratio, identifies if the ramp segment would be operating at an unacceptable LOS, and if the ramp segment would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-38, all ramp segments would operate at an acceptable LOS with the proposed project. Therefore, implementation of the proposed project would not create a significant adverse impact to the ramps segments.

**TABLE 4.13-38
RAMP SEGMENT SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

RAMP SEGMENT	A.M. PEAK HOUR			P.M. PEAK HOUR		
	CHANGE IN V/C	UNACC. LOS? ^[1]	SIG. ADV. IMP.? ^[2]	CHANGE IN V/C	UNACC. LOS?	SIG. ADV. IMP.?
I-5 northbound off-ramp at Main Street/Edgewood Road	0.002	No	No	0.008	No	No
SR 22 westbound off-ramp at La Veta Avenue	0.004	No	No	0.016	No	No
SR 22 eastbound off-ramp at Lawson Way/Town & Country Road	0.002	No	No	0.011	No	No

Source: P&D Consultants, 2007.

^[1] Unacc. LOS: Unacceptable LOS.

^[2] Sig. Adv. Imp.: Significant Adverse Impact.

Signalized Intersections

Table 4.13-39 summarizes the LOS for the signalized intersection in 2030 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-39, five intersections would operate at an unacceptable LOS during either the A.M. or P.M. peak hour. Parker Street at La Veta Avenue and Parker Street at Town & Country Road would operate at an unacceptable LOS E or F during both the A.M. and P.M. peak hour. Main Street at Chapman Avenue, Batavia Street at La Veta Avenue and Main Street at 17th Street would operate at an unacceptable LOS E or F during the P.M. peak hour. The remaining 11 intersections would operate at an acceptable LOS in 2030 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-39
SIGNALIZED INTERSECTION LEVELS OF SERVICE – 2030 WITHOUT THE PROJECT**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
1	Main Street at Chapman Avenue	0.820	D	0.912	E
2	Main Street at Palmyra Avenue	0.566	A	0.655	B
3	Main Street at Culver Avenue/Stewart Drive	0.484	A	0.720	C
4	Main Street at La Veta Avenue	0.602	B	0.728	C
5	Pepper Street at La Veta Avenue	0.681	B	0.799	C
7	Batavia Street at La Veta Avenue	0.722	C	0.903	E
8	Parker Street at La Veta Avenue	1.266	F	1.387	F
9 ^[2]	Main Street at Town & Country Road	0.545	A	0.705	C
11	Parker Street at Town & Country Road	0.929	E	1.020	F
12 ^[2]	Main Street at MainPlace Entrance/Exit	0.460	A	0.521	A
13 ^[2]	Main Street at Memory Lane	0.532	A	0.648	B
14 ^[2]	Lawson Way at Memory Lane	0.453	A	0.507	A
16 ^[2]	Broadway at Santa Clara Avenue	0.520	A	0.673	B
19 ^[2]	Main Street at 20 th Street	0.542	A	0.653	B
20	Broadway at 17 th Street	0.594	A	0.880	D
21	Main Street at 17 th Street	0.752	C	0.918	E

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

Table 4.13-40 summarizes the LOS for the signalized intersection in 2030 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-40, five intersections would operate at an unacceptable LOS during either the A.M. or P.M. peak hour. Parker Street at La Veta Avenue and Parker Street at Town & Country Road would operate at an unacceptable LOS E or F during both the A.M. and P.M. peak hours. Main Street at Chapman Avenue, Batavia Street at La Veta Avenue and Main Street at 17th Street would operate at an unacceptable LOS E or F during the P.M. peak hour. The remaining 11 intersections would operate at an acceptable LOS in 2030 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

TABLE 4.13-40
SIGNALIZED INTERSECTION LEVELS OF SERVICE – 2030 WITH THE PROJECT

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
1	Main Street at Chapman Avenue	0.822	D	0.915	E
2	Main Street at Palmyra Avenue	0.567	A	0.657	B
3	Main Street at Culver Avenue/Stewart Drive	0.489	A	0.722	C
4	Main Street at La Veta Avenue	0.606	B	0.733	C
5	Pepper Street at La Veta Avenue	0.681	B	0.799	C
7	Batavia Street at La Veta Avenue	0.722	C	0.903	E
8	Parker Street at La Veta Avenue	1.272	F	1.406	F
9 ^[2]	Main Street at Town & Country Road	0.545	A	0.714	C
11	Parker Street at Town & Country Road	0.944	E	1.044	F
12 ^[2]	Main Street at MainPlace Entrance/Exit	0.460	A	0.521	A
13 ^[2]	Main Street at Memory Lane	0.536	A	0.656	B
14 ^[2]	Lawson Way at Memory Lane	0.487	A	0.547	A
16 ^[2]	Broadway at Santa Clara Avenue	0.522	A	0.678	B
19 ^[2]	Main Street at 20 th Street	0.548	A	0.659	B
20	Broadway at 17 th Street	0.596	A	0.883	D
21	Main Street at 17 th Street	0.754	C	0.920	E

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

Table 4.13-41 summarizes the signalized intersection changes in ICU, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-41, implementation of the proposed project would create a significant adverse impact to the intersection of Parker Street at La Veta Avenue and the intersection of Parker Street at Town & Country Road because these intersections would operate at an unacceptable LOS during either the A.M. or P.M. peak hour and with an increase in the ICU of greater than 0.01. Mitigation measures for these two intersections are discussed in Section 4.13.5 (Mitigation Related to Transportation and Traffic).

Even though the intersection of Main Street at Chapman Avenue, the intersection of Batavia Street at La Veta Avenue and the intersection of Main Street at 17th Street would operate at an unacceptable LOS during the P.M. peak hour, implementation of the proposed project would not create a significant adverse impact because the increase in the ICU is less than 0.01. Implementation of the proposed project would not create a significant adverse impact to the remaining 11 signalized intersections because the intersections would operate at an acceptable LOS during both the A.M. and P.M. peak hours.

The ICU for the intersection of Pepper Street at La Veta Avenue, the intersection of Batavia Street at La Veta Avenue and the intersection of Main Street at Town & Country Road during either the A.M. or P.M. peak hour did not increase because the proposed project traffic was added to the non-critical movements at the intersection. The ICU for the intersection of Main Street at Westfield MainPlace Entrance/Exit did not increase because the proposed project would not add traffic to this intersection.

**TABLE 4.13-41
SIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN ICU	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	CHANGE IN ICU	UNACC. LOS?	SIG. ADV. IMP.?
1	Main Street at Chapman Avenue	0.002	No	No	0.003	Yes	No
2	Main Street at Palmyra Avenue	0.001	No	No	0.002	No	No
3	Main Street at Culver Avenue/Stewart Drive	0.005	No	No	0.002	No	No
4	Main Street at La Veta Avenue	0.004	No	No	0.005	No	No
5	Pepper Street at La Veta Avenue	0.000	No	No	0.000	No	No
7	Batavia Street at La Veta Avenue	0.000	No	No	0.000	Yes	No
8	Parker Street at La Veta Avenue	0.006	Yes	No	0.019	Yes	Yes
9	Main Street at Town & Country Road	0.000	No	No	0.009	No	No
11	Parker Street at Town & Country Road	0.015	Yes	Yes	0.024	Yes	Yes
12	Main Street at MainPlace Entrance/Exit	0.000	No	No	0.000	No	No
13	Main Street at Memory Lane	0.004	No	No	0.008	No	No
14	Lawson Way at Memory Lane	0.034	No	No	0.040	No	No
16	Broadway at Santa Clara Avenue	0.002	No	No	0.005	No	No
19	Main Street at 20 th Street	0.006	No	No	0.006	No	No
20	Broadway at 17 th Street	0.002	No	No	0.003	No	No
21	Main Street at 17 th Street	0.002	No	No	0.002	Yes	No

Source: P&D Consultants, 2007. **Bolded** items indicate implementation of the proposed project would create a significant adverse impact to the intersection.

[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

[2] Unacc. LOS: Unacceptable LOS.

[3] Sig. Adv. Imp.: Significant Adverse Impact.

Signalized Intersections at Caltrans Ramps

Table 4.13-42 summarizes the LOS for the signalized intersection at Caltrans ramps in 2030 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-42, two signalized intersections at Caltrans ramps would operate at an unacceptable LOS during either the A.M. or P.M. peak hour. SR 22 eastbound ramps/Lawson Way at Town & Country Road would operate at an unacceptable LOS F during the A.M. peak hour and at an unacceptable LOS E during the P.M. peak hour. Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road would operate at unacceptable LOS E during the P.M. peak hour. The remaining three signalized intersections at Caltrans ramps would operate at an acceptable LOS during both the A.M. and P.M. peak hours in 2030 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-42
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
2030 WITHOUT THE PROJECT**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[3]	LOS	DELAY (SEC/VEH)	LOS
6	SR 22 westbound ramps at La Veta Avenue	20.5	C	30.7	C
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	132.9	F	57.0	E
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	34.4	C	64.7	E
17 ^[2]	Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue	33.3	C	43.6	D
18 ^[2]	Main Street at I-5 southbound on-ramp/Buffalo Avenue	10.2	B	22.7	C

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[3] sec/veh: seconds per vehicle.

Table 4.13-43 summarizes the LOS for the signalized intersection at Caltrans ramps in 2030 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-43, two signalized intersections at Caltrans ramps would operate at an unacceptable LOS during either the A.M. or P.M. peak hour. SR 22 eastbound ramps/Lawson Way at Town & Country Road would operate at an unacceptable LOS F during the A.M. peak hour and at an unacceptable LOS E during the P.M. peak hour. Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road would operate at unacceptable LOS E during the P.M. peak hour. The remaining three signalized intersections at Caltrans ramps would operate at an acceptable LOS during both the A.M. and P.M. peak hours in 2030 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-43
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
2030 WITH THE PROJECT**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[3]	LOS	DELAY (SEC/VEH)	LOS
6	SR 22 westbound ramps at La Veta Avenue	20.5	C	31.3	C
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	132.5	F	63.4	E
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	34.2	C	65.6	E
17 ^[2]	Main Street at I-5 northbound on-ramp and southbound off-ramp/Santa Clara Avenue	33.5	C	43.8	D
18 ^[2]	Main Street at I-5 southbound on-ramp/Buffalo Avenue	10.4	B	22.8	C

Source: P&D Consultants, 2007. **Bolded** items indicate intersection would operate at below-standard LOS.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The acceptable LOS is LOS E because the intersection is within a Major Development Area in the City of Santa Ana.

^[3] sec/veh: seconds per vehicle.

Table 4.13-44 summarizes the percent change in delay for the signalized intersections at Caltrans ramps, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-44, implementation of the proposed project would create a significant adverse impact to the intersection of SR 22 eastbound ramps/Lawson Way at Town & Country Road and the intersection of Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road during the P.M. peak hour because these intersections would operate at an unacceptable LOS with an increase in the delay of greater than one percent. Mitigation measures for these two intersections are discussed in Section 4.13.5 (Mitigation Related to Transportation and Traffic).

Implementation of the proposed project would not create a significant adverse impact to the remaining three signalized intersections because the intersections would operate at an acceptable LOS during both the A.M. and P.M. peak hours. The average delay per vehicle at the intersection of SR 22 eastbound ramps/Lawson Way at Town & Country Road and the intersection of Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road decreased during the A.M. peak hour because proposed project traffic was added to the non-critical movements at the intersection. When traffic is added to the non-critical movements at an intersection, the average delay per vehicle decreases even though the sum of the delay for all vehicles at the intersection increases.

**TABLE 4.13-44
SIGNALIZED INTERSECTION AT CALTRANS RAMPS
SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		PERCENT CHANGE IN DELAY	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	PERCENT CHANGE IN DELAY	UNACC. LOS?	SIG. ADV. IMP.?
6	SR 22 westbound ramps at La Veta Avenue	0.0%	No	No	2.0%	No	No
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	- 0.3%	Yes	No	11.2%	Yes	Yes
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	- 0.6%	No	No	1.4%	Yes	Yes
17	Main Street at I-5 northbound on-ramp and southbound off-ramp/ Santa Clara Avenue	0.6%	No	No	0.5%	No	No
18	Main Street at I-5 southbound on-ramp/Buffalo Avenue	2.0%	No	No	0.4%	No	No

Source: P&D Consultants, 2007. **Bolded** items indicate implementation of the proposed project would create a significant adverse impact to the intersection.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] Unacc. LOS: Unacceptable LOS.

^[3] Sig. Adv. Imp.: Significant Adverse Impact.

Unsignalized Intersections

Table 4.13-45 summarizes the LOS for the unsignalized intersection in 2030 without the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-45, the unsignalized intersection would operate at acceptable LOS B. Lawson Way at Jeanette Lane has the worst P.M. peak hour delay of 11.1 seconds per vehicle and would operate at acceptable LOS B in 2030 without the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-45
UNSIGNALIZED INTERSECTION LEVELS OF SERVICE – 2030 WITHOUT THE PROJECT**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[3]	LOS	DELAY (SEC/VEH)	LOS
22 ^[2]	Lawson Way at Jeanette Lane	10.5	B	11.1	B

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The delay for this intersection was based on the worst intersection approach control delay.

^[3] sec/veh: seconds per vehicle.

Table 4.13-46 summarizes the LOS for the unsignalized intersection in 2030 with the proposed project during the A.M. and P.M. peak hours. As shown in Table 4.13-46, the unsignalized intersection would operate at acceptable LOS B. Lawson Way at Jeanette Lane has the worst P.M. peak hour delay of 13.1 seconds per vehicle and would operate at acceptable LOS B in 2030 with the proposed project. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-46
UNSIGNALIZED INTERSECTION LEVELS OF SERVICE – 2030 WITH THE PROJECT**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[3]	LOS	DELAY (SEC/VEH)	LOS
22 ^[2]	Lawson Way at Jeanette Lane	12.7	B	13.1	B

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] The delay for this intersection was based on the worst intersection approach control delay.

^[3] sec/veh: seconds per vehicle.

Table 4.13-47 summarizes the changes in delay for the unsignalized intersection, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project. As shown in Table 4.13-47, the unsignalized intersection would operate at an acceptable LOS with the proposed project. Therefore, implementation of the proposed project would not create a significant adverse impact to the unsignalized intersection.

**TABLE 4.13-47
UNSIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN DELAY (SEC/VEH) ^[2]	UNACC. LOS? ^[3]	SIG. ADV. IMP.? ^[4]	CHANGE IN DELAY (SEC/VEH)	UNACC. LOS?	SIG. ADV. IMP.?
22	Lawson Way at Jeanette Lane	2.2	No	No	2.0	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] sec/veh: seconds per vehicle.

^[3] Unacc. LOS: Unacceptable LOS.

^[4] Sig. Adv. Imp.: Significant Adverse Impact.

4.13.4.5 Congestion Management Program Traffic Analysis

A Congestion Management Program (CMP) Traffic Analysis is required when a proposed project generates more than 2,400 daily trips or more than 1,600 daily trips with direct access to a CMP

Highway. The CMP Highways in the vicinity of the proposed project are I-5 and SR 22. The proposed project does not have direct access to a CMP Highway. As discussed in Section 4.13.3.4 (Project Trip Generation), the proposed project would generate 2,080 daily trips, which is less than the minimum 2,400 daily trips required for a CMP Traffic Analysis. Therefore, the proposed project is exempt from a CMP Traffic Analysis.

4.13.4.6 Project Access Assessment/Geometric Configuration

The proposed project would provide three project accesses to the project site. Two project accesses would connect to Lawson Way to the east and one project access would connect to the commercial land uses of the City Place project to the west. The primary access to the proposed project would be at the intersection of Lawson Way at Jeanette Lane, which is located at the southeast corner of the building. The second access would be located at the northeast corner of the building connecting to Lawson Way and would be restricted to residents of the proposed project. The third project access would be located at the northwestern corner of the building and would connect to the commercial land uses of the City Place project to the west. However, this third project access would not be frequently used because it does not connect directly to the arterial highways. To analyze the worst-case scenario, it was assumed that all project traffic would access the project site at the intersection of Lawson Way at Jeanette Lane.

As discussed in Section 4.13.4.1 (2010 Traffic Conditions), the following intersection geometric lane configuration and control improvements would occur at the proposed project access of Lawson Way at Jeanette Lane:

- Install Stop sign on the eastbound approach.
- TWLTL median on Lawson Way would function as one northbound left-turn lane.
- Convert one southbound through lane to one shared through/right-turn lane.
- Add one eastbound shared left-/right-turn lane.

The proposed project access of Lawson Way at Jeanette Lane was analyzed based on two criteria: LOS and intersection queue lengths. As discussed in Sections 4.13.4.2 (2010 Traffic Impact Analysis) and 4.13.4.4 (2030 Traffic Impact Analysis), the proposed project access of Lawson Way at Jeanette Lane would operate at acceptable LOS B or better during the A.M. and P.M. peak hours in 2010 and 2030 with the proposed project.

The intersection queue lengths at the proposed project access of Lawson Way at Jeanette Lane were calculated for the northbound left-turn lane and the eastbound shared left-/right-turn lane based on the HCM methodology for unsignalized intersections. The storage length for the northbound left-turn lane is approximately 50 feet, and the storage length for the eastbound shared left-/right-turn lane is approximately 250 feet.

Table 4.13-48 summarizes the number of vehicles in queue rounded up to the next integer, the queue lengths, and if sufficient storage length is provided. The queue lengths were determined by multiplying the number vehicles in queue by 25 feet for a passenger car. As shown in Table 4.13-48, the proposed project access of Lawson Way at Jeanette Lane would provide sufficient storage lengths for the northbound left-turn lane and the eastbound shared left-/right-turn lane. The worst-case queue length would be 50 feet for the eastbound shared left-/right-turn lane in 2030 with the proposed project during the A.M. peak hour. The queue length calculation worksheets for 2010 and 2030 with the proposed project are incorporated into the LOS calculation worksheets which are provided in Appendix H of this DEIR.

**TABLE 4.13-48
QUEUE LENGTH ANALYSIS – PROJECT ACCESS OF LAWSON WAY AT JEANETTE LANE**

Analysis Scenario	Intersection Lane Approach	Storage Length (feet)	A.M. Peak Hour			P.M. Peak Hour		
			Vehicles in Queue	Queue Length (feet)	Sufficient Storage Length?	Vehicles in Queue	Queue Length (feet)	Sufficient Storage Length?
2010 with the proposed project	Northbound left-turn lane	50	1	25	Yes	1	25	Yes
	Eastbound shared left-/right-turn lane	250	1	25	Yes	2	50	Yes
2030 with the proposed project	Northbound left-turn lane	50	1	25	Yes	1	25	Yes
	Eastbound shared left-/right-turn lane	250	1	25	Yes	1	25	Yes

Source: P&D Consultants, 2007.

As discussed above, the proposed project access of Lawson Way at Jeanette Lane would operate at an acceptable LOS in 2010 and 2030 with the proposed project and would provide sufficient storage length for the northbound left-turn lane and the eastbound shared left-/right-turn lane. Therefore, implementation of the proposed project would not create a significant adverse impact to the proposed project accesses.

4.13.4.7 Parking Impact Analysis

As discussed in previous sections, the proposed project consists of 333 condominium units and 20 town homes for a total of 353 dwelling units. The proposed project will also provide 659 tenant parking spaces and 70 visitor parking spaces for a total of 729 parking spaces. Eight of the 659 tenant parking spaces will be handicapped parking spaces, and three of the 70 visitor parking spaces will be handicapped parking spaces.

Based on information provided by the City of Santa Ana, the existing City Place Specific Development zone will be amended at a later date to create a parking standard for the proposed project. The amended parking standard was anticipated to be similar to the First and Cabrillo Towers Project, which was recently approved by the City of Santa Ana. The First and Cabrillo Towers Project was a mixed-use development comprised of retail/commercial land uses on the ground floor and two high-rise residential towers similar to the proposed project. Implementation of the proposed project would not create a significant adverse parking impact if the proposed project complies with the new parking standards in the amended City Place Specific Development zone.

Table 4.13-49 compares the parking conditions for the proposed project and the First and Cabrillo Towers Project. As shown in Table 4.13-49, the proposed project would provide approximately 2.07 residential parking spaces per dwelling unit; and the First and Cabrillo Towers Project would provide approximately 1.93 residential parking spaces per dwelling unit because 52 of the total 774 parking spaces were reserved for the retail/commercial land uses. Therefore, the proposed project would provide a higher residential parking ratio than the recently approved First and Cabrillo Towers Project.

**TABLE 4.13-49
PARKING CONDITIONS COMPARISON SUMMARY**

Project	Land Use	Size	Parking Spaces	Parking Ratio
City Place Sky Lofts	Residential	353 DU ^[1]	729	2.07 spaces per DU
First and Cabrillo Towers	Residential	374 DU	722	1.93 spaces per DU
	Retail/Commercial	8.8 kSF ^[2]	52	5.91 spaces per kSF

Sources: EIP Associates, a division of PBS&J, *Metro East Mixed Use Overlay Zone Final Environmental Impact Report, Volume II: First and Cabrillo Towers Project*, 2007 and P&D Consultants, 2007.

^[1] DU: dwelling unit.

^[2] kSF: 1,000 square feet.

The minimum handicapped parking spaces requirement was determined based on the City of Santa Ana Municipal Code and the *2001 California Building Code (with Amendments and Supplements), Title 24, Part 2, Volume 2* (California Building Standards Commission, 2002). The minimum handicapped parking spaces requirement based on the City of Santa Ana Municipal Code was determined to be in compliance with the Americans with Disabilities Act (ADA) and is summarized in Table 4.13-50. Section 1109A of the *2001 California Building Code* stipulates that multifamily dwelling units provide at least two percent of the total tenant parking spaces as handicapped parking spaces and at least five percent of the total visitor parking spaces as handicapped parking spaces.

**TABLE 4.13-50
HANDICAPPED PARKING SPACES CRITERIA – CITY OF SANTA ANA MUNICIPAL CODE**

TOTAL NUMBER OF PARKING SPACES	REQUIRED HANDICAPPED PARKING SPACES	TOTAL NUMBER OF PARKING SPACES	REQUIRED HANDICAPPED PARKING SPACES
1 to 25	1	201 to 300	7
26 to 50	2	301 to 400	8
51 to 75	3	401 to 500	9
76 to 100	4	501 to 1,000	Two percent of total
101 to 150	5	1,001 and over	20 plus 1 for each
151 to 200	6		100 over 1,000

Source: City of Santa Ana Municipal Code, Section 41-1306.

Table 4.13-51 summarizes the handicapped parking analysis for the proposed project based on the City of Santa Ana Municipal Code and the *2001 California Building Code*. As shown in Table 4.13-51, the proposed project would provide insufficient handicapped parking spaces for both the tenant and visitor parking lots by five and one handicapped parking spaces, respectively.

**TABLE 4.13-51
HANDICAPPED PARKING ANALYSIS SUMMARY**

PARKING SPACES CATEGORY	TOTAL NUMBER OF PARKING SPACES	REQUIRED PARKING SPACES PER CODE		REQUIRED HANDICAPPED PARKING SPACES	HANDICAPPED PARKING SPACES SUPPLY	SUFFICIENT HANDICAPPED PARKING SPACES?
		CITY OF SANTA ANA MUNICIPAL CODE	2001 CALIFORNIA BUILDING CODE			
Tenant	659	13 = (659 x 2%)	13 = (659 x 2%)	13	8	No (Shortage of five handicapped parking spaces)
Visitor	70	3	4 = (70 x 5%)	4	3	No (Shortage of one handicapped parking space)

Sources: Steven Ehrlich Architects and P&D Consultants, 2007. **Bolded** items indicate a handicapped parking shortage will exist.

As discussed above, the City of Santa Ana will amend the existing City Place Specific Development zone at a later date to create a parking standard for the proposed project. However, the proposed project could currently supply a sufficient amount of handicapped parking spaces by converting some of the tenant parking spaces to five handicapped parking spaces and some of the visitor parking spaces to one handicapped parking space. The conversion rate from a regular parking space to a handicapped parking space is greater than one because handicapped parking spaces require at least a five-foot aisle for a regular handicapped parking space or at least an eight-foot aisle for a van-accessible handicapped parking space. Therefore, implementation of the proposed project would not create a significant adverse parking impact if the proposed project converted some of the tenant parking spaces to provide five additional handicapped parking spaces in the tenant parking lot and some of the visitor parking spaces to provide one additional handicapped parking space in the visitor parking lot; however, the proposed project would comply with the new parking standard once the City Place Specific Development zone is amended, and therefore would not create a significant adverse impact related to parking.

4.13.4.8 Parking Structure Operations

The proposed project would provide a parking structure with 659 tenant parking spaces and 70 visitor parking spaces for a total 729 parking spaces. Figure 4.13-14 shows a schematic of the parking structure circulation and layout. The visitor parking spaces would be at ground level, and the tenant parking spaces would be divided between the upper and lower levels. There would be 376 tenant parking spaces located on the upper levels, and 283 tenant parking spaces located on the lower levels. Access to visitor parking spaces would be located on the southern side of the building and would not be controlled by gates. Access to tenant parking spaces would be located on the northern side of the building and would be controlled by two gates. The two gates would either be an insertion card gate, a proximity card gate, or an automatic vehicle identification (AVI) gate. The only access point to the upper levels would be at the east gate, and the only access point to the lower levels would be at the west gate.

The parking structure operations were analyzed for the A.M. and P.M. peak hours based on the queuing theory because access to the tenant parking spaces were controlled by gates. Queuing theory provides a methodology for estimating the number of vehicles in queue, queue lengths and the time spent in queue based on the mean arrival rate, the mean service rate and the number of servers.

Figure 4.13-14
City Place Sky Lofts
Parking Structure Layout and Circulation

As discussed in Section 4.13.3.4 (Project Trip Generation), the proposed project would generate approximately 156 A.M. peak hour trips with 25 inbound trips and 131 outbound trips and approximately 184 P.M. peak hour trips with 124 inbound trips and 60 outbound trips. However, the trip generation rates listed in *Trip Generation* (ITE, 2003) include all trip purposes for a Condominium/Townhouse land use made by the tenants, visitors, truck deliveries, etc. The distinction between trips made by tenants versus trips made by other sources such as visitors and delivery trucks is important in this case because the proposed project separates the visitor and tenant parking lots.

For a conservative queuing analysis, it was assumed that 95 percent of the A.M. and P.M. peak hour trips were made by tenants and that five percent of the A.M. and P.M. peak hour trips were made by other sources such as visitors or delivery trucks. Therefore, the proposed project would generate approximately 148 A.M. peak hour trips made by tenants with 24 inbound trips and 124 outbound trips and approximately 175 P.M. peak hour trips made by tenants with 118 inbound trips and 57 outbound trips.

As discussed above, the proposed project would have two gates for the tenant parking lots. However, each gate would function as a single server because the east gate only provides access to the lower levels and the west gate only provides access to the upper levels. Therefore, the peak hour inbound and outbound tenant trips were distributed proportionally between the two gates based on the number of parking spaces for the upper and lower levels. Table 4.13-52 summarizes the mean arrival rates for each gate used in the queuing analysis for the inbound and outbound A.M. and P.M. peak hour trips.

**TABLE 4.13-52
MEAN ARRIVAL RATES – TENANT PARKING**

GATE LOCATION	MEAN ARRIVAL RATE (vph) ^[1]			
	A.M. PEAK HOUR		P.M. PEAK HOUR	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
East Gate	14	71	67	33
West Gate	10	53	51	24

Source: P&D Consultants, 2007.

^[1] vph: vehicles per hour.

As discussed above, the two gates would either be controlled by an insertion card gate, a proximity card gate or an AVI gate. The mean service rates for an intersection card gate, a proximity card gate and an AVI gate is 435, 600, and 800 vehicles per hour (vph), respectively.² For a conservative queuing analysis, it was assumed that the gate control would be an insertion card gate with a mean service rate of 435 vph.

Table 4.13-53 summarizes the expected average and 90 percent probability for the number of vehicles in queue, queue lengths and time in queue for the east and west gates during the A.M. and P.M. peak hours. The queue lengths were determined by multiplying the number vehicles in queue by 25 feet for a passenger car. As shown in Table 4.13-53, worst-case expected average number of vehicles in queue for both gates would be less than one vehicle for all scenarios. The worst-case 90 percent probability for the number of vehicles in queue for both gates would be at most two vehicles for the A.M. peak hour outbound direction and the P.M. peak hour inbound direction.

² The architectural firm for the City Place Sky Lofts, Steven Erlich Architects, provided the mean service rates for the gate controls.

**TABLE 4.13-53
QUEUE ANALYSIS – CONTROL GATES**

Analysis Scenario	Gate Location	Direction	Expected Average			90 Percent Probability		
			Vehicles in Queue	Queue Length (feet)	Time in Queue (seconds)	Vehicles in Queue	Queue Length (feet)	Time in Queue (seconds)
A.M. Peak Hour	East Gate	Inbound	0.00	0.0	0.3	0.2	4.8	1.6
		Outbound	0.03	0.8	1.6	1.1	29.3	9.7
	West Gate	Inbound	0.00	0.0	0.2	0.6	15.1	5.0
		Outbound	0.02	0.4	1.1	1.0	25.8	8.5
P.M. Peak Hour	East Gate	Inbound	0.03	0.7	1.5	1.1	28.5	9.4
		Outbound	0.01	0.2	0.7	0.9	21.6	7.1
	West Gate	Inbound	0.02	0.4	1.1	1.0	25.8	8.4
		Outbound	0.00	0.1	0.5	0.8	19.4	6.4

Source: P&D Consultants, 2007.

Implementation of the proposed project would not create a significant adverse impact to the parking structure operations because the expected average number of vehicles in queue would be less than one vehicle for all scenarios and the worst-case 90 percent probability would be at most two vehicles in queue.

4.13.4.9 Delivery Truck Access Assessment

The proposed project would provide a two-bay truck loading area located at the northwestern corner of the building. A truck-turning analysis was conducted to determine if a delivery truck could access the proposed truck loading area without performing multiple turning maneuvers or direction changes. The truck-turning templates were generated from a computer-aided design (CAD) program, AutoTURN. AutoTURN simulates highway vehicles turning maneuvers at low speeds.

The delivery truck used in this truck-turning analysis was the standard 30-foot single-unit truck design vehicle as described in *A Policy on Geometric Design of Highway and Streets* (American Association of State Highway and Transportation Officials (AASHTO), 2004). The minimum centerline turning radius (CTR) for the standard 30-foot single unit is 38 feet. However, it should be noted that the CRT is typically smaller when the vehicle is driven in the reverse direction because the CRT is measured from the rear axle.

Figure 4.13-15 shows the truck-turning analysis for an inbound delivery truck to the proposed truck loading area. As shown in Figure 4.13-15, an inbound delivery truck would strike the east curb as the delivery truck backs into the east loading bay. However, as shown in Figure 4.13-15, an inbound delivery truck would not strike any curbs if the east curb radius was increased to 25 feet.

Figures 4.13-16 and 4.13-17 show the truck-turning analysis for an outbound delivery truck from the east and west loading bays of the proposed truck loading area, respectively. As shown in Figure 4.13-16, an outbound delivery truck from the east loading bay would not strike any fixed structures. As shown in Figure 4.13-17, an outbound delivery truck leaving from the west loading bay would strike the west curb as the delivery trucks makes a northbound left turn and would require several turning maneuvers and direction changes to avoid striking the building west of the proposed project. However, as shown in Figure 4.13-17, an exiting delivery truck would not strike any curbs if the west curb radius was increased to 25 feet.

Figure 4.13-15
Truck-Turning Analysis
Inbound Delivery Trucks

Therefore, implementation of the proposed project would create a significant adverse impact related to a design feature. Mitigation measures for the two-bay loading area are discussed in Section 4.13.5 (Mitigation Related to Transportation and Traffic).

4.13.4.10 Neighborhood Impacts

Implementation of the proposed project could create a significant adverse impact to residential neighborhoods within the vicinity of the proposed project by introducing cut-through traffic into the residential neighborhoods. Cut-through traffic typically occurs when drivers seek a faster alternative route through local neighborhoods when the main arterial highways become congested during the A.M. and P.M. peak periods. The residential neighborhoods within the vicinity of the proposed project include Fairhaven, Floral Park, Park Santiago, and Santa Ana Triangle. Figure 4.13-18 shows the four residential neighborhoods and the general directions for cut-through traffic.

Cut-through traffic in Fairhaven and Park Santiago could occur as project traffic travels in the east-west direction between Main Street and Grand Avenue. However, cut-through traffic in this direction would be unlikely because it would be more time consuming to travel through these two residential neighborhoods at 25 mph with multiple stop-controlled intersections than to travel on the arterial highways. The minimum distance traveled between Main Street and Grand Avenue through Fairhaven and Park Santiago would be approximately 1.1 miles. A faster route between Main Street and Grand Avenue would be to travel on SR 22.

Cut-through traffic in Park Santiago could occur as project traffic travels in the northwest-southeast direction between Main Street and 17th Street. However, cut-through traffic in this direction would be unlikely because it would be more time consuming to travel through this residential neighborhood at 25 mph with multiple stop-controlled intersections and speed bumps than to travel on the arterial highways. The minimum distance traveled between Main Street and 17th Street through Park Santiago would be at least one mile. A faster route between Main Street and 17th Street would be to remain on Main Street and 17th Street or to travel on I-5.

Cut-through traffic in Floral Park could occur as project traffic travels in the northeast-southwest direction between Broadway and 17th Street. However, as shown earlier on Figure 4.13-3, only five percent of the project traffic would travel in this northeast-southwest direction. As shown earlier in Figure 4.13-4, 104 daily trips, eight A.M. peak hour trips and ten P.M. peak hour trips would travel in this northeast-southwest direction. Therefore, no substantial amount of project traffic was anticipated to travel through Floral Park.

Cut-through traffic in Santa Ana Triangle could occur as project traffic travels in the northwest-southeast direction between Main Street and 17th Street. However, as shown on Figure 4.13-3, only five percent of project traffic would travel in this northwest-southeast direction. As shown on Figure 4.13-4, 104 daily trips, eight A.M. peak hour trips and ten P.M. peak hour trips would travel in this northwest-southeast direction. Therefore, no substantial amount of project traffic was anticipated to travel through Santa Ana Triangle.

As discussed above, it would be more time consuming to travel through Park Santiago and Fairhaven than to remain on the arterial highways, and no substantial amount of project traffic is anticipated to travel through Floral Park and Santa Ana Triangle. Therefore, implementation of the proposed project would not create a significant adverse impact to the four residential neighborhoods.

Figure 4.13-16
Truck-Turning Analysis
Outbound Delivery Trucks from East Loading Bay

Figure 4.13-17
Truck-Turning Analysis
Outbound Delivery Trucks from West Loading Bay

Figure 4.13-18
City of Santa Ana
Residential Neighborhoods

4.13.4.11 Pedestrian Circulation Impacts

The proposed project would provide pedestrian facilities around the proposed residential building. The proposed project would provide sidewalks of six feet to eight feet on the north, south and west sides of the building, which is greater than the four-foot sidewalk for a local street per the City of Santa Ana Standard Plans. The proposed project would provide sidewalks of 10 feet to 13 feet on the east side of the building on Lawson Way, which is greater than the five-foot minimum for sidewalks on arterial streets per the City of Santa Ana Standard Plans. In addition, the proposed sidewalk on the east side of the building would connect to the greater pedestrian circulation network on Lawson Way in the City of Orange and in the City of Santa Ana. Therefore, implementation of the proposed project would not create a significant adverse impact to pedestrian circulation.

4.13.5 MITIGATION RELATED TO TRANSPORTATION AND TRAFFIC

4.13.5.1 2010 Road Segments

For the 2010 traffic conditions, the Main Street road segment between La Veta Avenue and Town & Country Road cannot be mitigated to below a level of significance without amending the MPAH road classification from a Major Arterial to a Principal Arterial. The road reclassification from a Major Arterial to a Principal Arterial would provide one additional lane in each direction. This road reclassification would require an amendment to the City of Orange General Plan and the City of Santa Ana General Plan.

However, as discussed in Section 4.13.4.4 (2030 Traffic Impact Analysis), Main Street between La Veta Avenue and Town & Country Road would operate at an acceptable LOS D in 2030 without and with the proposed project. Daily traffic volumes on Main Street in 2030 were generally forecasted to be lower than the daily traffic volumes in 2010 because the buildout of the MPAH would provide additional road capacity on the parallel north-south arterial highways such as Bristol Street to the west and Grand Avenue to the east. The additional north-south arterial highways road capacities would alleviate traffic demand on Main Street by shifting some of the traffic demand to Bristol Street and Grand Avenue. Therefore, implementation of the proposed project would create a temporary significant and unavoidable adverse impact to Main Street between La Veta Avenue and Town & Country Road until Bristol Street and Grand Avenue is built out to the MPAH designations.

4.13.5.2 2030 Signalized Intersections

As shown in Tables 4.13-39 and 4.13-40, for the 2030 signalized intersections, the intersections of Parker Street at La Veta Avenue and Parker Street at Town & Country Road would operate at unacceptable LOS F both with and without the proposed project during the P.M. peak hour. In addition, the intersections of Parker Street at La Veta Avenue and Parker Street at Town & Country Road would operate at unacceptable LOS F and LOS E, respectively, during the A.M. peak hour. Therefore, implementation of the proposed project would cause these signalized intersections to operate at an unacceptable LOS, and with an increase in the ICU of greater than 0.01, representing a significant adverse impact.

Mitigation measures for impacts of the proposed project on the intersections of Parker Street at La Veta Avenue and Parker Street at Town & Country Road are enumerated below in Mitigation Measures T-1 and T-2.

- T-1 Prior to the issuance of occupancy permits, and subject to the approval of the City of Orange, the applicant shall deposit its fair-share contributions into the Transportation System Improvement Area Joint Powers Agreement (TSIA JPA) between the cities of Orange and Santa Ana for the following improvements at the intersection of Parker Street and La Veta Avenue: add one northbound right-turn lane; stripe the unstriped eastbound right-turn lane; convert one eastbound through lane to one shared through/right-turn lane; convert one westbound through lane to one left-turn lane; and modify traffic signal phasing to provide a protected left-turn phase for the eastbound and westbound approaches.
- T-2 Prior to the issuance of occupancy permits, and subject to the approval of the City of Orange, the applicant shall deposit its fair-share contributions into the TSIA JPA for the following improvements at the intersection of Parker Street and Town & Country Road: convert one eastbound through lane to one shared through/left-turn lane; and modify the signal phasing to provide an eastbound/westbound split phase.

4.13.5.3 2030 Signalized Intersections at Caltrans Ramps

For the 2030 signalized intersections at Caltrans ramps, the intersections of SR 22 eastbound ramps/Lawson Way at Town & Country Road and Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road would operate at unacceptable LOS E both with and without the proposed project during the P.M. peak hour. In addition, the SR 22 eastbound ramps/Lawson Way at Town & Country Road would operate at unacceptable LOS F both with and without the project during the A.M. peak hour. Therefore, implementation of the proposed project would cause these Caltrans signalized intersections to operate at an unacceptable LOS, and with an increase in delay of greater than one percent, representing a significant adverse impact.

Mitigation measures for impacts of the proposed project on the intersections of SR 22 eastbound ramps/Lawson Way at Town & Country Road and Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road are enumerated below in Mitigation Measures T-3 and T-4.

- T-3 Prior to the issuance of occupancy permits, and subject to the approval of the City of Orange, the applicant shall deposit its fair-share contributions into the TSIA JPA for the following improvements at the intersection of SR 22 eastbound ramps and Lawson Way at Town & Country Road: convert one northbound right-turn lane to one shared through/right-turn lane; convert one southbound shared through/right-turn lane to one shared through/left-/right-turn lane; convert one westbound through lane to one shared through/left-turn lane; and modify traffic signal phasing to provide an eastbound/westbound split phase.
- T-4 Prior to the issuance of occupancy permits, and subject to the approval of the City of Santa Ana, the applicant shall deposit its fair-share contributions into the TSIA JPA for the following improvements at the intersection of Main Street at I-5 HOV ramps, I-5 northbound off-ramp and Edgewood Road: convert one westbound shared through/left-turn lane to one left-turn lane; convert one westbound right-turn lane to one shared through/right-turn lane; and modify the traffic signal phasing to provide a protected eastbound right-turn phase that is overlapped with the northbound left-turn phase.

4.13.5.4 Parking

Implementation of the proposed project would not create a significant adverse parking impact if the proposed project were to provide five additional handicapped parking spaces in the tenant parking lot. However, SD-59 would currently be amended to incorporate an updated parking requirement that would

reflect the proposed project parking ratios. Therefore, implementation of the proposed project would not result in a significant adverse impact related to parking.

4.13.5.5 Two-Bay Truck Loading Area

For the two-bay truck loading area located at the northwestern corner of the building, the truck-turning analysis concluded that an inbound delivery truck would strike the proposed east curb as the delivery truck backs into the east loading bay. Also, an outbound delivery truck leaving from the west loading bay would strike the proposed west curb as it makes a northbound left turn and would require several turning maneuvers and direction changes to avoid striking the building west of the proposed project.

The mitigation measure for impacts of the proposed project on the two-bay truck loading area is enumerated below in Mitigation Measure T-5.

T-5 Prior to the issuance of building permits, the applicant shall increase the two-bay truck loading area's west and east curb radii to 25 feet and use the west loading bay primarily for delivery vans.

4.13.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION RELATED TO TRANSPORTATION AND TRAFFIC

4.13.6.1 2010 Road Segments

Implementation of the proposed project would result in temporary traffic impacts. For the 2010 traffic conditions, the Main Street road segment between La Veta Avenue and Town & Country Road cannot be mitigated to below a level of significance without amending the MPAH road classification from a Major Arterial to a Principal Arterial. The road reclassification from a Major Arterial to a Principal Arterial would provide one additional lane in each direction. This road reclassification would require an amendment to the City of Orange General Plan and the City of Santa Ana General Plan.

As discussed in Section 4.13.4.4 (2030 Traffic Impact Analysis), Main Street between La Veta Avenue and Town & Country Road would operate at an acceptable LOS D in 2030 without and with the proposed project. Daily traffic volumes on Main Street in 2030 were generally forecasted to be lower than the daily traffic volumes in 2010 because the buildout of the MPAH would provide additional road capacity on the parallel north-south arterial highways such as Bristol Street to the west and Grand Avenue to the east. The additional north-south arterial highways road capacities would alleviate traffic demand on Main Street by shifting some of the traffic demand to Bristol Street and Grand Avenue. Therefore, implementation of the proposed project would create a temporary significant and unavoidable adverse impact to Main Street between La Veta Avenue and Town & Country Road until Bristol Street and Grand Avenue is built out to the MPAH designations.

4.13.6.2 2030 Signalized Intersections

Table 4.13-54 summarizes the LOS for the signalized intersections in 2030 with the proposed project with mitigation measures T-1 and T-2 during the A.M. and P.M. peak hours. As shown in Table 4.13-54, all signalized intersections would operate at acceptable LOS D or better. Parker Street at Town & Country Road has the worst A.M. peak hour ICU of 0.850 and would operate at acceptable LOS D in 2030 with the proposed project with mitigation measure T-2. The detailed LOS calculation worksheets are provided in Appendix H of this DEIR.

**TABLE 4.13-54
SIGNALIZED INTERSECTION LEVELS OF SERVICE
2030 WITH THE PROJECT WITH THE MITIGATION MEASURES**

INDEX	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		ICU	LOS	ICU	LOS
8	Parker Street at La Veta Avenue	0.672	B	0.828	D
11	Parker Street at Town & Country Road	0.850	D	0.836	D

Source: P&D Consultants, 2007.

Table 4.13-55 summarizes the signalized intersection changes in ICU, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project with mitigation measures. As shown in Table 4.13-55, all signalized intersections would operate at an acceptable LOS in 2030 with the proposed project with mitigation measures T-1 and T-2. Therefore, the mitigation measures for the signalized intersections would reduce the significant adverse impacts to below a level of significance.

**TABLE 4.13-55
SIGNALIZED INTERSECTION SIGNIFICANT ADVERSE IMPACT SUMMARY
2030 WITH THE PROJECT WITH THE MITIGATION MEASURES**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR			P.M. PEAK HOUR		
		CHANGE IN ICU	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	CHANGE IN ICU	UNACC. LOS?	SIG. ADV. IMP.?
8	Parker Street at La Veta Avenue	-0.594	No	No	-0.559	No	No
11	Parker Street at Town & Country Road	-0.079	No	No	-0.184	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered in Figure 4.13-13.

^[2] Unacc. LOS: Unacceptable LOS.

^[3] Sig. Adv. Imp.: Significant Adverse Impact.

4.13.6.3 2030 Signalized Intersections at Caltrans Ramps

Table 4.13-56 summarizes the LOS for the signalized intersections at Caltrans ramps in 2030 with the proposed project with mitigation measures T-3 and T-4 during the A.M. and P.M. peak hours. As shown in Table 4.13-56, all signalized intersections at Caltrans ramps would operate at acceptable LOS D or better. Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road has the worst P.M. peak hour delay of 54.6 seconds per vehicle and would operate at acceptable LOS D in 2030 with the proposed project with mitigation measure T-4. Figure 4.13-19 shows the circulation network in 2030 with mitigation measures for the signalized intersections at Caltrans ramps.

**TABLE 4.13-56
SIGNALIZED INTERSECTION AT CALTRANS RAMPS LEVELS OF SERVICE
2030 WITH THE PROJECT WITH THE MITIGATION MEASURES**

INDEX ^[1]	INTERSECTION	A.M. PEAK HOUR		P.M. PEAK HOUR	
		DELAY (SEC/VEH) ^[2]	LOS	DELAY (SEC/VEH)	LOS
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	51.6	D	54.3	D
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	34.2	C	54.6	D

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-13.

^[2] sec/veh: seconds per vehicle.

Table 4.13-57 summarizes the percent change in delay for the signalized intersections at Caltrans ramps, identifies if the intersection would be operating at an unacceptable LOS, and if the intersection would be significantly adversely impacted by implementation of the proposed project with mitigation measures. As shown in Table 4.13-57, all signalized intersections at Caltrans ramps would operate at an acceptable LOS in 2030 with the proposed project with mitigation measures T-3 and T-4. Therefore, the mitigation measures for the signalized intersections at Caltrans ramps would reduce the significant adverse impacts to below a level of significance.

**TABLE 4.13-57
SIGNALIZED INTERSECTION AT CALTRANS RAMPS SIGNIFICANT ADVERSE IMPACT SUMMARY – 2030
WITH THE MITIGATION MEASURES**

INDEX ^[1]	INTERSECTION	A.M. Peak Hour			P.M. Peak Hour		
		PERCENT CHANGE IN DELAY	UNACC. LOS? ^[2]	SIG. ADV. IMP.? ^[3]	PERCENT CHANGE IN DELAY	UNACC. LOS?	SIG. ADV. IMP.?
10	SR 22 eastbound ramps/Lawson Way at Town & Country Road	– 61.2%	No	No	– 4.7%	No	No
15	Main Street at I-5 HOV ramps/I-5 northbound off-ramp/Edgewood Road	– 0.6%	No	No	– 15.6%	No	No

Source: P&D Consultants, 2007.

^[1] The index refers to the intersections as they are numbered on Figure 4.13-19.

^[2] Unacc. LOS: Unacceptable LOS.

^[3] Sig. Adv. Imp.: Significant Adverse Impact.

Figure 4.13-19
Circulation Network – 2030 (11x17)

4.13.6.4 Two-Bay Truck Loading Area

As discussed earlier, the truck-turning analysis concluded that an inbound delivery truck would strike the east curb as the delivery truck backs into the east loading bay. In addition, the truck turning analysis demonstrated that an outbound delivery truck leaving from the west loading bay would strike the west curb as the delivery trucks makes a northbound left turn and would require several turning maneuvers and direction changes to avoid striking the building west of the proposed project.

With Mitigation Measure T-5, implementation of the proposed project would not create a significant adverse impact to truck delivery operations if the curb radii near the truck loading area were increased to 25 feet and if the west loading bay was used primarily for delivery vans. Therefore, the mitigation measure for the two-bay truck loading area would reduce the significant adverse impact to below a level of significance.