APPENDIX 4.17-2

TRAFFIC ANALYSIS

URBAN | CROSSROADS

ANAHEIM HILLS FESTIVAL SPA NO. 6

TRAFFIC ANALYSIS

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Reference Number	Agency	Date
15699-08 TA Report	City of Anaheim	March 13, 2025

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ATAM	Anaheim Transportation Analysis Model
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DA	Development Area
EIR	Environmental Impact Report
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LOS	Level of Service
MPAH	Master Plan of Arterial Highways
MPH	Miles Per Hour
NCHRP	National Cooperative Highway Research Program
OCTA	Orange County Transportation Authority
PHF	Peak Hour Factor
Project	Anaheim Hills Festival SPA No. 6
SP	Specific Plan
SPA	Specific Plan Amendment
TA	Traffic Analysis
TIIF	Transportation Impact and Improvement Fee
TIM	Transportation Implementation Manual
v/c	Volume to Capacity
vphgpl	Vehicles per Hour Green per Lane

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1 INTRODUCTION

This report presents the results of the Traffic Analysis (TA) for the Anaheim Hills Festival Specific Plan Amendment (SPA) (Project), located south of Santa Ana Canyon Road and west of Roosevelt Road in the City of Anaheim, as shown in Exhibit 1-1. The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and, where necessary, recommend improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. This traffic study has been prepared in accordance with the City of Anaheim's Criteria for Preparation of Traffic Impact Studies (City Guidelines) and consultation with City staff during the traffic study scoping process. (1) The City-approved Project Traffic Study Scoping Agreement is provided in Appendix 1.1 of this TA.

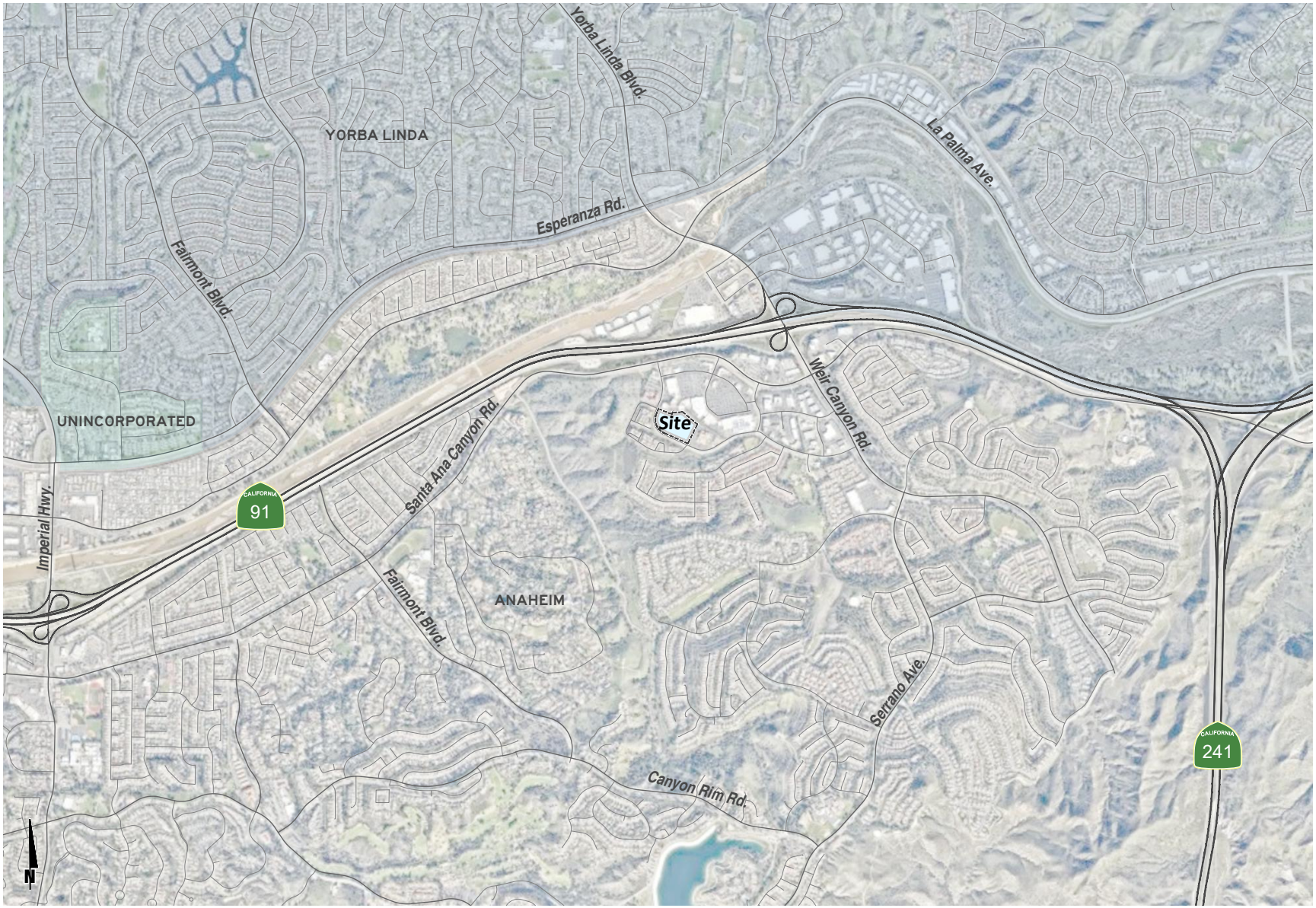
1.1 SUMMARY OF FINDINGS

All study area intersections are forecast to operate at an acceptable level of service (LOS) during the AM and PM peak hours under Opening Year (2029 With Project traffic conditions and General Plan Buildout traffic conditions based on the Highway Capacity Manual (HCM) or Intersection Capacity Utilization (ICU) methodology.

Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road, is anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under Opening Year (2029) traffic conditions and General Plan Buildout traffic conditions. Santa Ana Canyon Road, from Anaheim Hills Road to Fairmont Boulevard, is also anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under General Plan Buildout traffic conditions. Based on the peak hour roadway capacity thresholds, Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road, is anticipated to operate at an unacceptable LOS in the westbound direction during the AM and PM peak hour and in the eastbound direction during the PM peak hour only, under Opening Year (2029) With Project traffic conditions and General Plan Buildout traffic conditions. Under both the daily and peak hour analyses, the Project is anticipated to increase the Volume-to-Capacity (V/C) by less than the threshold identified for intersections. As such, the Project-related increase in V/C is deemed not significant.

The high volume of through vehicles is attributable to vehicles bypassing the SR-91 Freeway during peak hour commute hours throughout the day. Introducing additional lanes along Santa Ana Canyon Road would encourage more vehicles to utilize this roadway segment and would be counterintuitive to the State's goals with regards to Vehicle Miles Traveled. Moreover, roadway widening is infeasible due to right-of-way limitations and is inconsistent with the City's General Plan. Additionally, the intersections on both ends of the roadway segment are anticipated to operate at an acceptable LOS suggesting that the additional capacity accommodated through turn lanes at the choke-points of the roadway segments (e.g., intersections) can sufficiently handle the anticipated future traffic.

EXHIBIT 1-1 : LOCATION MAP



Access to the Project site will be provided via two driveways on Festival Drive. Driveway 1 is an existing full access driveway (no turn restrictions) on the north side of the Project. The Project is to construct the following improvements in conjunction with development to facilitate site access:

- Project to construct Driveway 2 on Festival Drive. The Project is to install a stop control on the southbound approach and a shared left-right turn lane.
- Festival Drive appears to be built to its ultimate curb-to-curb width adjacent to the Project. However, the Project should improve the curb-and-gutter, sidewalks, and landscape along the frontage as necessary in addition to accommodating improvements to facilitate site access at the driveways.

1.2 PROJECT OVERVIEW

The existing Specific Plan (SP) is divided into four Development Areas (DA) by land use. DA 1 is the Scenic Commercial area fronting Santa Ana Canyon Road between Festival Drive and Roosevelt Road, DA 2 is the Regional Commercial use that contains the department stores, grocery, other food/retail uses, and the vacant cinema, DA 3 is the Visitor Commercial area located west of Festival Drive which includes the existing hotel, and DA 4 is the Senior Residential area south of Festival Drive. The SPA proposes the implementation of a new 16.2-acre mixed-use development area on the upper level of the commercial center as a new DA 5 (which is a portion of the old DA 2). Exhibit 1-2 illustrates the proposed DA locations for the SPA.

Specifically, the Project proposes to demolish the existing 62,676-square-foot vacant cinema and develop in its place 447 multi-family residential dwelling units while retaining the remaining existing commercial uses within the new DA 5. Approximately 13,310 square feet of existing retail would be retained in DA 2 as a result of the new DA 5 (resulting in a net reduction of 49,366 square feet of retail space). The retail within DA 5 will include the following existing uses: 6,475 square feet of restaurant use, 9,200 square feet of office use, 38,160-square-foot fitness/gym, 13,276 square feet of tutor/retail space, and 11,033-square-foot medical office building. A preliminary site plan for the proposed multi-family residential development is shown at Exhibit 1-3. Access to the Project site will be provided via two driveways on Festival Drive. Driveway 1 is an existing driveway on the north side of the Project. Both driveways are assumed to have full access (no turn restrictions). For the purposes of the Traffic Analysis, the Project is expected to be developed within a single phase with an anticipated Opening Year of 2029.

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021) for ITE Land Use Code 221 for Multifamily Housing (Mid-Rise, 4-10 Floors) has been utilized. (2) Only traffic for the proposed multi-family development is taken into consideration as the existing retail, restaurant, and office uses would be captured as part of the existing intersection traffic count program. The Project is anticipated to generate a total of 1,624 vehicle trip-ends per day with 132 AM peak hour trips and 139 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 Project Trip Generation of this report.

EXHIBIT 1-2 : SPA PROPOSED DEVELOPMENT AREAS

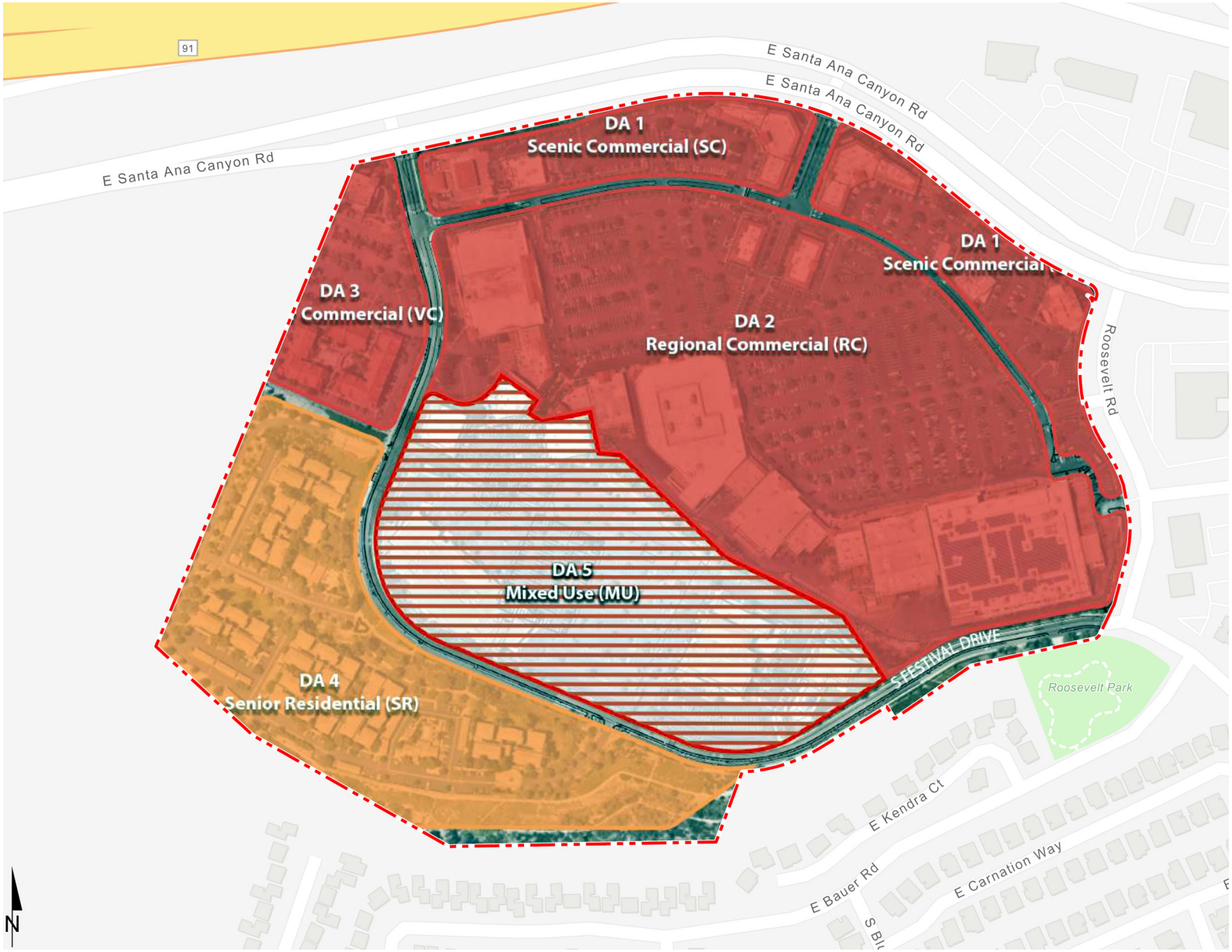
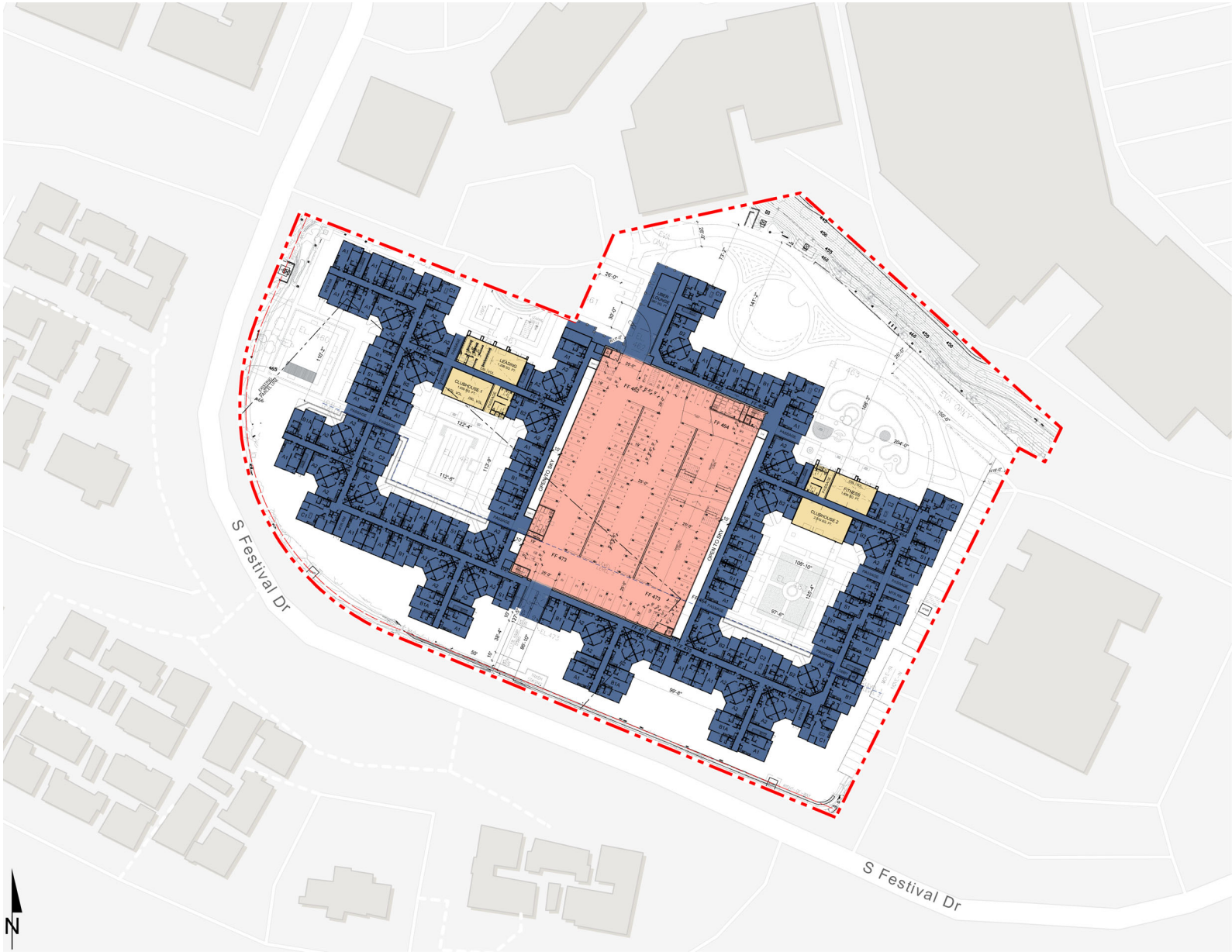


EXHIBIT 1-3 : PRELIMINARY SITE PLAN



15699.dwg site plan

1.3 ANALYSIS SCENARIOS

Consistent with the City's Guidelines, for the purposes of the Traffic Analysis, potential deficiencies to traffic and circulation have been assessed for each of the following conditions:

- Existing (2024) Conditions
- Opening Year (2029) Without Project Conditions: Cumulative existing traffic conditions plus all developments within the study area which have not yet been constructed but has been approved through a discretionary action or building permit issuance. This alternative corresponds to the no project alternative for purposes of an Environmental Impact Report (EIR).
- Opening Year (2029) With Project Conditions
- General Plan Buildout Without Project Conditions: Buildout of all developments anticipated in the City's General Plan or implied by the City's Zoning Ordinance. Anaheim Transportation Analysis Model (ATAM) Year 2025 or later projections shall be utilized for this purpose.
- General Plan Buildout With Project Conditions

1.3.1 EXISTING (2024) CONDITIONS

Information for Existing (2024) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 OPENING YEAR (2029) CONDITIONS

The Opening Year (2029) Without Project conditions analysis determines the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed other approved cumulative development projects. To account for background traffic growth, an ambient growth factor from Existing (2024) conditions of 5.10 percent (1 percent per year, compounded over 5 years) is included for Opening Year (2029) Without Project conditions, in conjunction with traffic associated from approved cumulative development projects. This comprehensive list was compiled from information provided by the City of Anaheim. The assumed ambient growth factor is based on the requirements per the City Guidelines.

The Opening Year (2029) With Project conditions include the Opening Year (2029) Without Project conditions traffic forecasts plus the traffic generated by the proposed Project. The roadway network is similar to Opening Year (2029) Without Project except for new connections to be constructed by the Project. The Opening Year (2029) With Project conditions analysis is intended to identify "Opening Year" deficiencies associated with the development of the proposed Project based on the expected background growth within the study area.

1.3.3 GENERAL PLAN BUILDOUT CONDITIONS

Traffic projections for General Plan Buildout conditions were derived from the latest ATAM using accepted procedures for model forecast refinement and smoothing. The General Plan Buildout post-processing volumes have been provided by the City's traffic consultant. The General Plan Buildout conditions analysis has been utilized to determine if improvements funded through regional transportation mitigation fee programs can accommodate the long-range cumulative traffic at the target LOS identified in the City of Anaheim (lead agency) General Plan. Each of the applicable transportation fee programs are discussed in more detail in Section 7 *Local and Regional Funding Mechanisms*.

1.4 STUDY AREA

To ensure that this TA satisfies the City of Anaheim's traffic study requirements, Urban Crossroads, Inc. prepared a Project traffic study scoping package for review by City of Anaheim staff prior to the preparation of this report. This agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The agreement approved by the City is included in Appendix 1.1 of this TA.

1.4.1 INTERSECTIONS

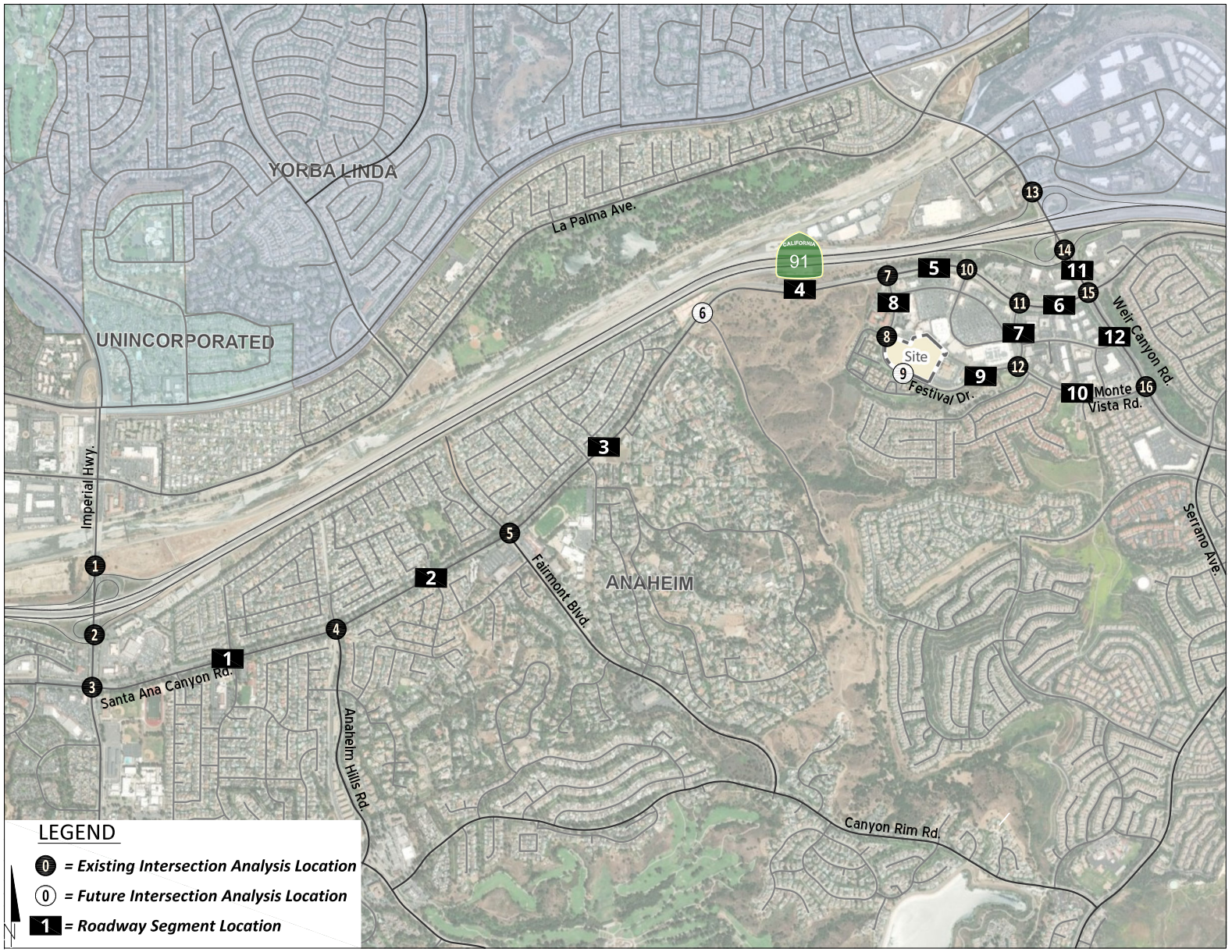
The following 16 study area intersections shown at Exhibit 1-4 and listed in Table 1-1 were selected for this TA based on consultation with City of Anaheim staff. The "50 peak hour trip" criterion utilized by the City of Anaheim is consistent with the methodology employed by the County of Orange, and generally represents a minimum number of trips at which a typical intersection would have the potential to be affected by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of influence (i.e., study area). Other analysis intersections within the adjacent cities were not selected for evaluation as the Project is anticipated to contribute less than 50 peak hour trips.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP Facility?
1	Imperial Hwy. & SR-91 WB Ramps	Anaheim, Caltrans	Yes
2	Imperial Hwy. & SR-91 EB Ramps	Anaheim, Caltrans	Yes
3	Imperial Hwy. & Santa Ana Canyon Rd.	Anaheim	No
4	Anaheim Hills Rd. & Santa Ana Canyon Rd.	Anaheim	No
5	Fairmont Bl. & Santa Ana Canyon Rd.	Anaheim	No
6	Deer Canyon Rd. & Santa Ana Canyon Rd.	Anaheim	No
7	Festival Dr. & Santa Ana Canyon Rd.	Anaheim	No
8	Festival Dr. & Driveway 1	Anaheim	No
9	Driveway 2 & Festival Dr.	Anaheim	No
10	Festival Center Dwy. & Santa Ana Canyon Rd.	Anaheim	No
11	Roosevelt Rd. & Santa Ana Canyon Rd.	Anaheim	No
12	Roosevelt Rd. & Festival Dr./Monte Vista Rd.	Anaheim	No
13	Weir Canyon Rd. & SR-91 WB Ramps	Yorba Linda, Caltrans	No
14	Weir Canyon Rd. & SR-91 EB Ramps	Anaheim, Caltrans	No
15	Weir Canyon Rd. & Santa Ana Canyon Rd.	Anaheim	No
16	Weir Canyon Rd. & Monte Vista Rd.	Anaheim	No

The intent of a Congestion Management Program (CMP) is to directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. Imperial Highway at the SR-91 westbound and eastbound ramps (study area intersections #1 and #2) are identified as CMP facilities in the County of Orange per the Orange County CMP. (3)

EXHIBIT 1-4 : STUDY AREA



1.4.2 ROADWAY SEGMENTS

Based on consultation with City of Anaheim staff, the study area roadway segments selected for evaluation are shown at Exhibit 1-4 and listed in Table 1-2.

TABLE 1-2: ROADWAY SEGMENT CAPACITY ANALYSIS LOCATIONS

#	Study Area Roadway Segments
1	Santa Ana Canyon Rd., Imperial Hwy. to Anaheim Hills Rd.
2	Santa Ana Canyon Rd., Anaheim Hills Rd. to Fairmont Bl.
3	Santa Ana Canyon Rd., Fairmont Bl. to Deer Canyon Rd.
4	Santa Ana Canyon Rd., Deer Canyon Rd. to Festival Dr.
5	Santa Ana Canyon Rd., Festival Dr. to Roosevelt Rd.
6	Santa Ana Canyon Rd., Roosevelt Rd. to Weir Canyon Rd.
7	Roosevelt Rd., Santa Ana Canyon Rd. to Festival Dr.
8	Festival Dr., Santa Ana Canyon Rd. to Driveway 1
9	Festival Dr., Driveway 2 to Roosevelt Rd.
10	Monte Vista Rd., Roosevelt Rd. to Weir Canyon Rd.
11	Weir Canyon Rd., SR-91 Freeway to Santa Ana Canyon Rd.
12	Weir Canyon Rd., Santa Ana Canyon Rd. to Festival Dr.

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 3 *Area Conditions*, Section 5 *Opening Year (2029) Traffic Conditions*, and Section 6 *General Plan Buildout Conditions* includes the detailed analysis. A summary of the Intersection Operations Analysis LOS results and Roadway Segment Analysis results for all analysis scenarios is presented in Tables 1-3 and 1-4, respectively.

TABLE 1-3: SUMMARY OF INTERSECTION LOS

			Opening Year (2029)				General Plan Buildout			
	Existing (2024)		Without Project		With Project		Without Project		With Project	
# Intersection	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1 Imperial Hwy. & SR-91 WB Ramps	B	A	B	B	B	B	B	B	B	B
2 Imperial Hwy. & SR-91 EB Ramps	B	A	C	A	C	A	C	B	C	B
3 Imperial Hwy. & Santa Ana Canyon Rd.	B	B	B	B	B	B	B	B	B	B
4 Anaheim Hills Rd. & Santa Ana Canyon Rd.	A	A	B	A	B	A	B	B	B	B
5 Fairmont Bl. & Santa Ana Canyon Rd.	B	C	B	C	C	C	C	D	C	D
6 Deer Canyon Rd. & Santa Ana Canyon Rd.	B	B	B	C	B	C	C	D	C	D
7 Festival Dr. & Santa Ana Canyon Rd.	A	A	A	A	A	B	B	B	B	B
8 Festival Dr. & Driveway 1	Future Intersection		A	B	A	B	A	B	A	B
9 Driveway 2 & Festival Dr.	A	A	A	A	A	A	A	A	A	A
10 Festival Center Dwy. & Santa Ana Canyon Rd.	B	B	B	B	B	B	B	B	B	B
11 Roosevelt Rd. & Santa Ana Canyon Rd.	Future Intersection		Future Intersection		A	A	Future Intersection		B	B
12 Roosevelt Rd. & Festival Dr./Monte Vista Rd.	A	A	A	A	A	A	A	A	A	A
13 Weir Canyon Rd. & SR-91 WB Ramps	A	A	A	A	A	A	A	A	A	B
14 Weir Canyon Rd. & SR-91 EB Ramps	A	A	A	A	A	A	A	A	A	A
15 Weir Canyon Rd. & Santa Ana Canyon Rd.	A	B	A	B	A	B	A	B	B	B
16 Weir Canyon Rd. & Monte Vista Rd.	A	A	A	B	A	B	A	B	A	B

TABLE 1-4: SUMMARY OF ROADWAY SEGMENT ANALYSIS RESULTS

Summary of Daily Roadway Segment Analysis

#	Roadway	Segment Limits	Existing (2024)	Opening Year (2029) Without Project	Opening Year (2029) With Project	General Plan Without Project	General Plan With Project
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	C	**D**	**D**	**D**	**D**
2		Anaheim Hills Rd. to Fairmont Bl.	C	C	C	**D**	**D**
3		Fairmont Bl. to Deer Canyon Rd.	C	C	C	C	C
4		Deer Canyon Rd. Festival Dr.	C	B	B	C	C
5		Festival Dr. to Roosevelt Rd.	C	A	A	A	A
6		Roosevelt Rd. to Weir Canyon Rd.	C	C	C	C	C
7	Roosevelt Rd.	Santa Ana Canyon Rd. to Festival Dr.	C	A	A	A	A
8	Festival Dr.	Santa Ana Canyon Rd. to Driveway 1	C	A	A	A	A
9		Driveway 2 to Roosevelt Rd.	C	A	A	A	A
10	Monte Vista Rd.	Roosevelt Rd. to Weir Canyon Rd.	C	A	A	A	A
11	Weir Canyon Rd.	SR-91 Freeway to Santa Ana Canyon Rd.	C	C	C	C	C
12		Santa Ana Canyon Rd. to Monte Vista Rd.	C	A	A	A	A

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

Summary of Peak Hour Roadway Segment Analysis

#	Roadway	Segment Limits	Peak Hour	Direction	Existing (2024)	Opening Year (2029) Without Project	Opening Year (2029) With Project	General Plan Without Project	General Plan With Project
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	EB	N/A	C	C	C	C
			AM	WB	N/A	C	**D**	**D**	**D**
			PM	EB	N/A	**D**	**D**	**D**	**D**
			PM	WB	N/A	**E**	**E**	**E**	**E**
2	Santa Ana Canyon Rd.	Anaheim Hills Rd. to Fairmont Bl.	AM	EB	N/A	N/A	N/A	B	B
			AM	WB	N/A	N/A	N/A	C	C
			PM	EB	N/A	N/A	N/A	B	C
			PM	WB	N/A	N/A	N/A	B	C

[1] Peak Hour Roadway Segment Analyses has been analyzed for segments anticpated to operate at an unacceptable LOS under the Daily Roadway Segment Analysis.

1.5.1 EXISTING (2024) CONDITIONS

Intersections

The study area intersections are currently operating at an acceptable LOS during the peak hours.

Roadway Segments

There are no study area roadway segments currently operating at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria.

Off-Ramp Queues

There are no movements that currently experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2024) traffic conditions.

1.5.2 OPENING YEAR (2029) CONDITIONS

Intersections

The study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under Opening Year (2029) Without Project and With Project traffic conditions.

Roadway Segments

The following study area roadway segments are anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under both Opening Year (2029) Without Project and With Project traffic conditions:

- Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road (#1) – LOS D

Off-Ramp Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under both Opening Year (2029) Without Project and With Project traffic conditions.

1.5.3 GENERAL PLAN BUILDOUT CONDITIONS

Intersections

The study area intersections are anticipated to continue to operate at an acceptable LOS under General Plan Buildout Without Project and With Project traffic conditions.

Roadway Segments

The following study area roadway segments are anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under both General Plan Buildout Without Project and With Project traffic conditions:

- Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road (#1) – LOS D
- Santa Ana Canyon Road, from Anaheim Hills Road to Fairmont Boulevard (#2) – LOS D

Off-Ramp Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under both General Plan Buildout Without Project and With Project traffic conditions.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the minimum improvements needed to accommodate site access and maintain acceptable peak hour operations for the proposed Project. The site adjacent recommendations are shown at Exhibit 1-5.

The existing stop control and intersection geometry should remain at the intersections of Festival Drive & Driveway 1 (#8).

Recommendation 1 – Driveway 2 & Festival Drive (#9) – The following improvement is necessary to accommodate site access:

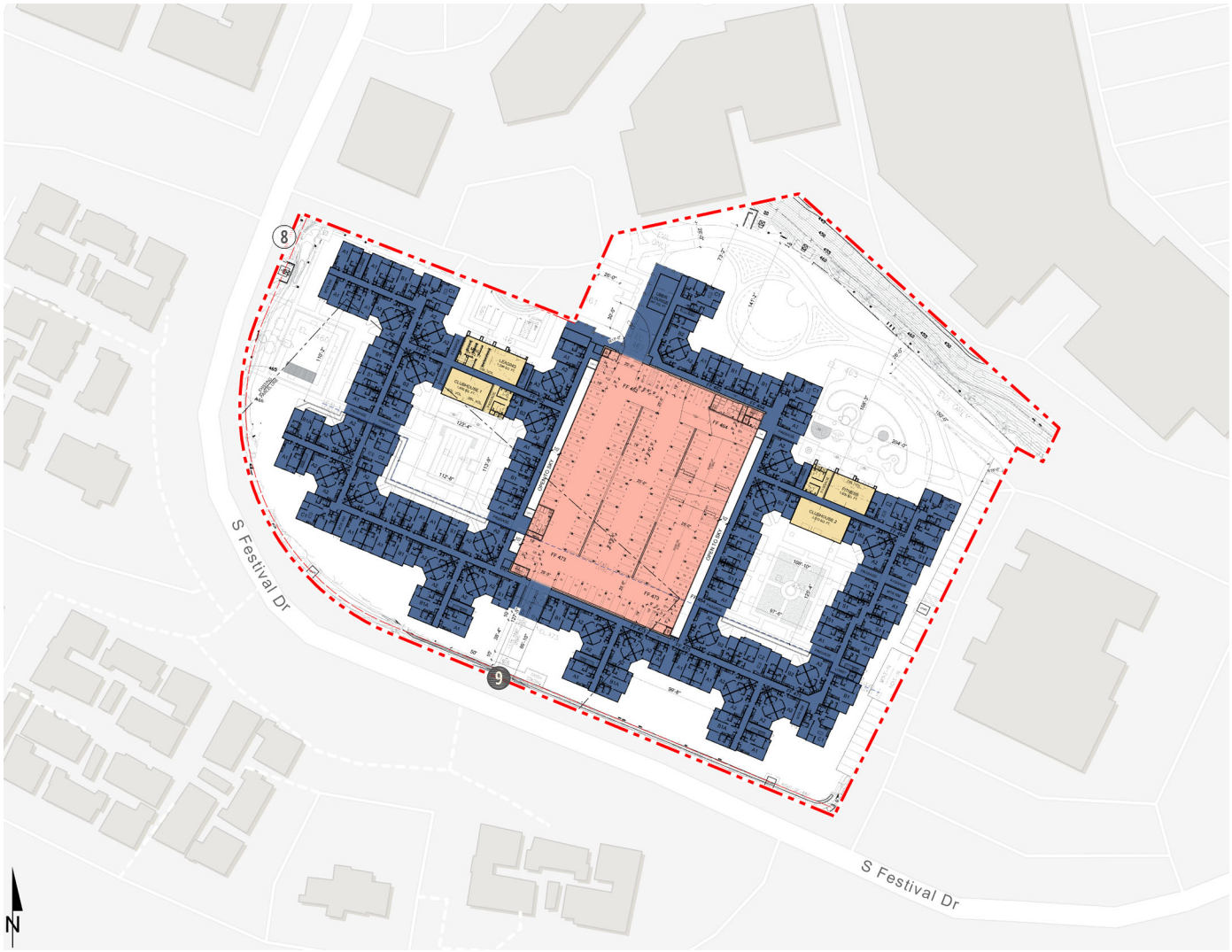
- Project to install a stop control on the southbound approach and a shared left-right turn lane.

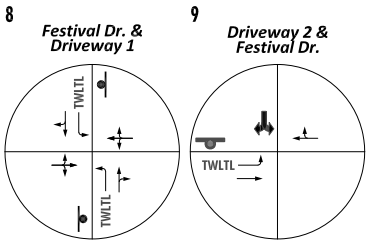
Recommendation 2 – Festival Drive is located on the Project's western and southern boundary. Festival Drive is a Private Street, and therefore its ultimate condition is not defined by the City of Anaheim General Plan. However, the Project is to construct Festival Drive along the Project's frontage to its ultimate half width as defined in the SP.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

Sight distance at each Project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and City of Anaheim sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

EXHIBIT 1-5 : SITE ACCESS RECOMMENDATIONS





LEGEND

- (0) = *Existing Intersection Analysis Location*
- (0) = *Future Intersection Analysis Location*
- = *Existing Stop Sign*
- = *Stop Sign Improvement*
- = *Existing Traffic Lane*
- = *Traffic Lane Improvement*

1.6.2 OFF-SITE RECOMMENDATIONS

There are no off-site improvements recommended as all study area intersections are anticipated to operate at an acceptable LOS for all analysis scenarios during the morning and evening peak hours. However, the Project Applicant shall pay requisite fees for the applicable pre-existing fee programs (see Section 7 *Local and Regional Funding Mechanisms*).

Although the roadway segments of Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road and from Anaheim Hills Road to Fairmont Boulevard, are anticipated to operate at an unacceptable LOS based on the daily and peak roadway capacity thresholds and minimum LOS criteria under General Plan Buildout With Project traffic conditions, no roadway widening improvements have been recommended.

The high volume of through vehicles is attributable to vehicles bypassing the SR-91 Freeway during peak commute hours throughout the day. Introducing additional lanes along Santa Ana Canyon Road would encourage more vehicles to utilize this roadway segment and would be counterintuitive to the State's goals with regards to Vehicle Miles Traveled. Roadway widening is also infeasible due to right-of-way limitations and is inconsistent with the City's General Plan. Additionally, the Project is anticipated to increase the V/C by less than the City of Anaheim's deficiency criteria threshold identified for intersections, and the intersections on both ends of the roadway segments are anticipated to operate at an acceptable LOS (LOS D or better) suggesting that the additional capacity accommodated through turn lanes at the choke-points of the roadway segments (e.g., intersections) can sufficiently handle the anticipated future traffic. Discussion in greater detail is found in Sections 5.8.2 and 6.8.2 *Improvements to Address Deficiencies at Roadway Segments* of this report.

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the City of Anaheim's traffic study guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors, such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing a breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. LOS analysis was conducted to determine existing traffic conditions using the ICU methodology for signalized study intersections.(4) The HCM (7th Edition) methodology was used to determine the LOS for unsignalized intersections and Caltrans facilities. The HCM methodology expresses the LOS at an intersection in terms of average control delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Anaheim requires signalized intersection operations analysis to be evaluated through ICU methodology, which compares the peak hour traffic volumes to intersection capacity. Lane capacities of 1,700 vehicles per hour green per lane (vphgpl) have been utilized for this analysis, consistent with the City's traffic study guidelines. A 0.05 lost time factor (clearance) and inherent vehicle delay between cycles with an assumed signal cycle of 100 seconds has been assumed for the ICU calculations. The ICU LOS definitions based on V/C ratio are presented in Table 2-1.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Level of Service	Critical Volume-to-Capacity (V/C) Ratio
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	> 1.00

Analysis of Caltrans operated facilities has been conducted in Synchro (Version 12) through the application of the HCM 7th Edition methodology for signalized intersections. Lane configurations and various other parameters such as signal timing was based on current operating characteristics as obtained from field review and signal timing worksheets provided by Caltrans District 12 staff. Future lane configurations were assumed the same as existing conditions for the General Plan Without Project and With Project scenarios. Table 2-2 presents the signalized intersection delay and LOS standards throughout the study area.

TABLE 2-2: SIGNALIZED INTERSECTION LOS THRESHOLDS WITH HCM

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Serice, V/C ≤ 1.0[1]
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and indvidual cycle failures are noticeable.	35.01 to 55.00	D
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F

Source: HCM, 7th Edition

[1] if V/C is greater than 1.0 then LOS is F per HCM

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Customary practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g., PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Anaheim requires the operations of unsignalized intersections to be evaluated using the methodology described in the 7th Edition Highway Capacity Manual (HCM) methodology, which expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (6) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-3). At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop controlled intersections, LOS is computed for the intersection as a whole (average delay).

TABLE 2-3: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Serice, V/C ≤ 1.0[1]
Little or no delays.	0 to 10.00	A
Short traffic delays.	10.01 to 15.00	B
Average traffic delays.	15.01 to 25.00	C
Long traffic delays.	25.01 to 35.00	D
Very long traffic delays.	35.01 to 50.00	E
Extreme traffic delays with intersections capacity exceeded.	>50.00	F

Source: HCM, 7th Edition

[1] if V/C is greater than 1.0 then LOS is F per HCM

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term ”signal warrants“ refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or determine the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (7)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (7) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions and for all future analysis scenarios for existing unsignalized intersections. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics. For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection. Urban warrants have been used as posted speed limits on the major roadways with unsignalized intersections are 40 miles per hour or below and rural warrants have been used where speeds exceed 40 miles per hour.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Similarly, the speed limit has been used as the basis for determining the use of Urban and Rural warrants. Traffic signal warrant analyses were performed for the following study area intersections shown in Table 2-4:

TABLE 2-4: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

#	Intersection
6	Deer Canyon Rd. & Santa Ana Canyon Rd.
8	Festival Dr. & Driveway 1
9	Driveway 2 & Festival Dr.

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 Opening Year *(2029) Traffic Conditions* and Section 6 *General Plan Buildout Conditions* of this report. It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 ROADWAY SEGMENT CAPACITY ANALYSIS

Roadway segment operations have been evaluated using the Roadway Capacity Thresholds provided in the Orange County Transportation Authority (OCTA) Guidance for Administration of the Orange County Master Plan of Arterial Highways (MPAH) and the County of Orange Transportation Implementation Manual (TIM). (8) (9) These roadway capacities are "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic. In other words, while using ADT for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity.

2.5 OFF-RAMP QUEUING ANALYSIS

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the SR-91 Freeway at the Imperial Highway and Weir Canyon Road interchanges. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and "spill back" onto the freeway mainline from the off-ramps. The 95th percentile queue has also been utilized to assess the queues at the study area interchanges to identify any potential peak hour queuing issues.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The 95th percentile queue is derived from the average queue plus 1.65 standard deviations.

2.6 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

The City of Anaheim's Growth Management Element requires a V/C ratio of 0.90 (Level of Service or LOS D) to be the lowest acceptable LOS at intersections following implementation of improvements. (10) Intersection improvements sufficient to bring intersections and roadway segments to the acceptable service levels must be identified. In order to maintain LOS D at intersections, arterial links (roadway segments) should be maintained to LOS C or better.

2.7 DEFICIENCY CRITERIA

A transportation impact on an intersection shall be deemed significant in accordance with the following Table 2-5 (per the City's Guidelines):

TABLE 2-5: CITY OF ANAHEIM DEFICIENCY CRITERIA

LOS	Final v/c Ratio	Project-Related Increase in v/c
C	> 0.701-0.800	≥ 0.050
D	> 0.801-0.900	≥ 0.030
E, F	> 0.901	≥ 0.010

The Final v/c Ratio shall mean the future V/C ratio at an intersection considering impacts with Project, ambient Growth, and Related Projects but without any proposed mitigation.

Cumulative traffic deficiencies are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic deficiencies requiring additional improvements to maintain acceptable level of service operations with or without the Project. When the pre-Project condition is already below LOS D (i.e., unacceptable LOS), the Project will be responsible for contributing to the recommended improvements at intersections that receive 50 or more peak hour project-related trips through payment of fees into pre-existing fee programs or fair share contribution.

2.8 FAIR SHARE CONTRIBUTION

For study area intersections identified as meeting the City's deficiency thresholds (see Section 2.7 *Deficiency Criteria*), the Project's equitable share is to be calculated using the following equation:

$$P = T / (Tb - Te)$$

Where:

P = The equitable share for the proposed project's traffic impact.

T = The vehicle trips generated by the project during peak hour of adjacent street, vph.

Tb = General Plan Buildout traffic volumes, vph.

Te = Existing traffic volume plus approved projects that have not been constructed or occupied (Opening Year (2029) Without Project), vph.

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Anaheim General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrant analyses. (10)

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Anaheim staff (Appendix 1.1), the study area includes a total of 16 existing and future intersections as shown previously at Exhibit 1-4 Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 EXISTING ROADWAY NETWORK

Exhibit 3-2 shows the City of Anaheim General Plan Circulation Element. The City of Anaheim General Plan does not include roadway cross-sections.

Scenic Expressways are defined within the City of Anaheim General Plan Circulation Element as four-to-six-lane lane divided roadways with a right-of-way that varies from a width of 106 to 148 feet. Scenic expressways have restricted access, serve intercity traffic, and provide scenic vistas.

Major Arterials are typically six-lane divided roadways with a 120-foot right-of-way. Typical major arterials have a landscaped median, left turn pockets, and parking lanes adjacent to each curb.

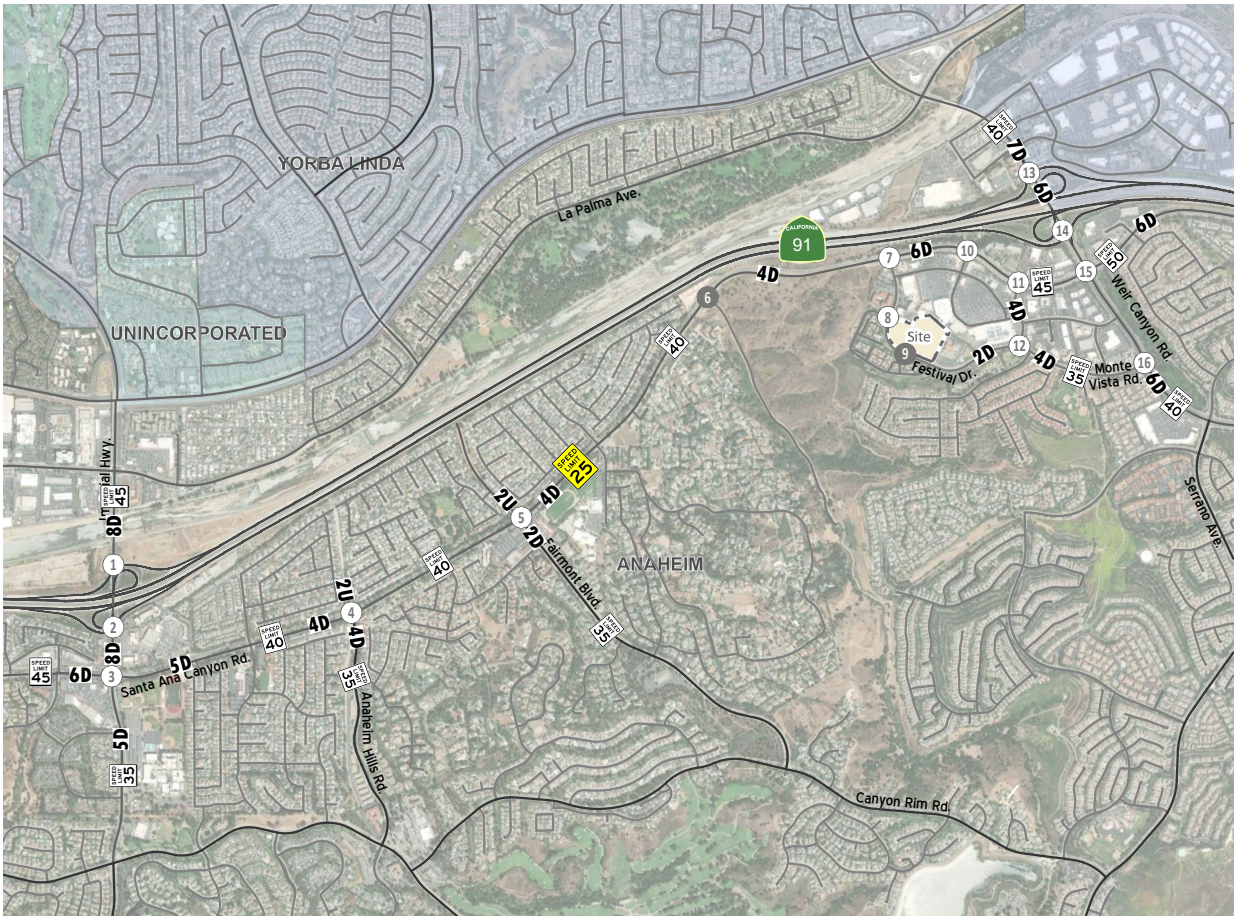
Primary Arterials are four- to six-lane divided roadways with a typical 106-foot right-of-way. Typical primary arterials with six lanes do not include parking; four-lane primary arterials include left turn pockets and two parking lanes.

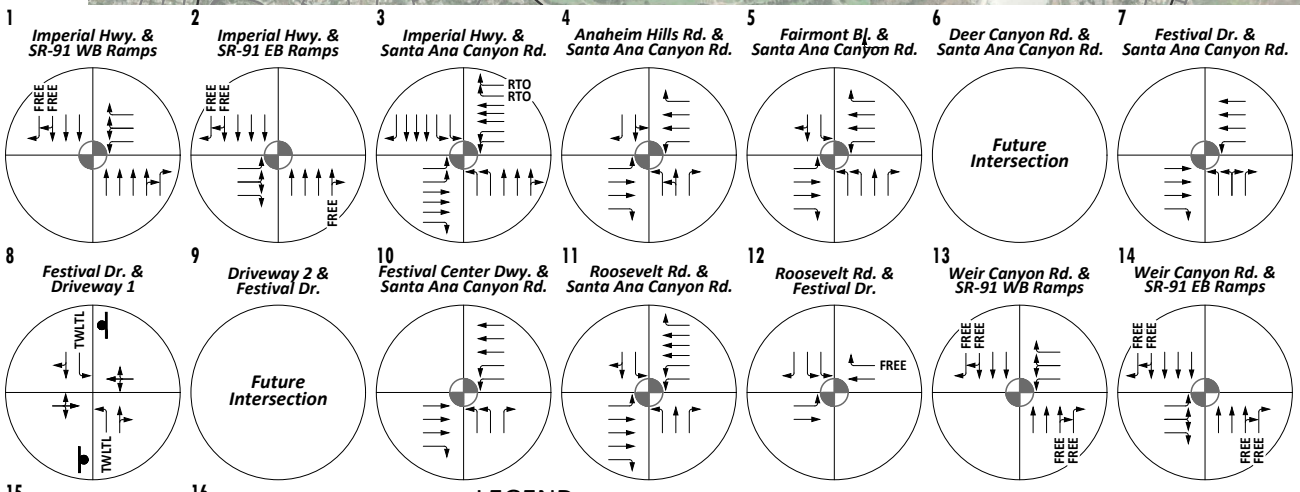
Hillside Secondary Arterials are four-lane undivided roadways, with two parking lanes, and a typical right-of-way width of 66 feet without driveway access and 78 feet with driveway access.

Santa Ana Canyon Road is classified as a scenic expressway between Lakeview Avenue and Imperial Highway and between Roosevelt Road and Riverview Drive and is classified as a primary arterial between Imperial Highway and Roosevelt Road. Santa Ana Canyon Road currently exists within the study area with six lanes west of Imperial Highway and east of Festival Drive, five lanes from Imperial highway to Solomon Drive, and four lanes east of Solomon Drive. Santa Ana Canyon Road has a raised median, no street parking, and a posted speed limit of 45 miles per hour (MPH) west of Imperial Highway, 40 MPH from Imperial Highway to Festival Drive, 45 MPH from Festival Drive to Wier Canyon Road, and 50 MPH east of Weir Canyon Road.

Weir Canyon Road is classified as a scenic expressway between the SR-91 westbound ramps and Oak Canyon Drive and exists within the study area with six lanes, a raised median, no on-street parking, and a posted speed limit of 40 MPH.

EXHIBIT 3-1 : EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



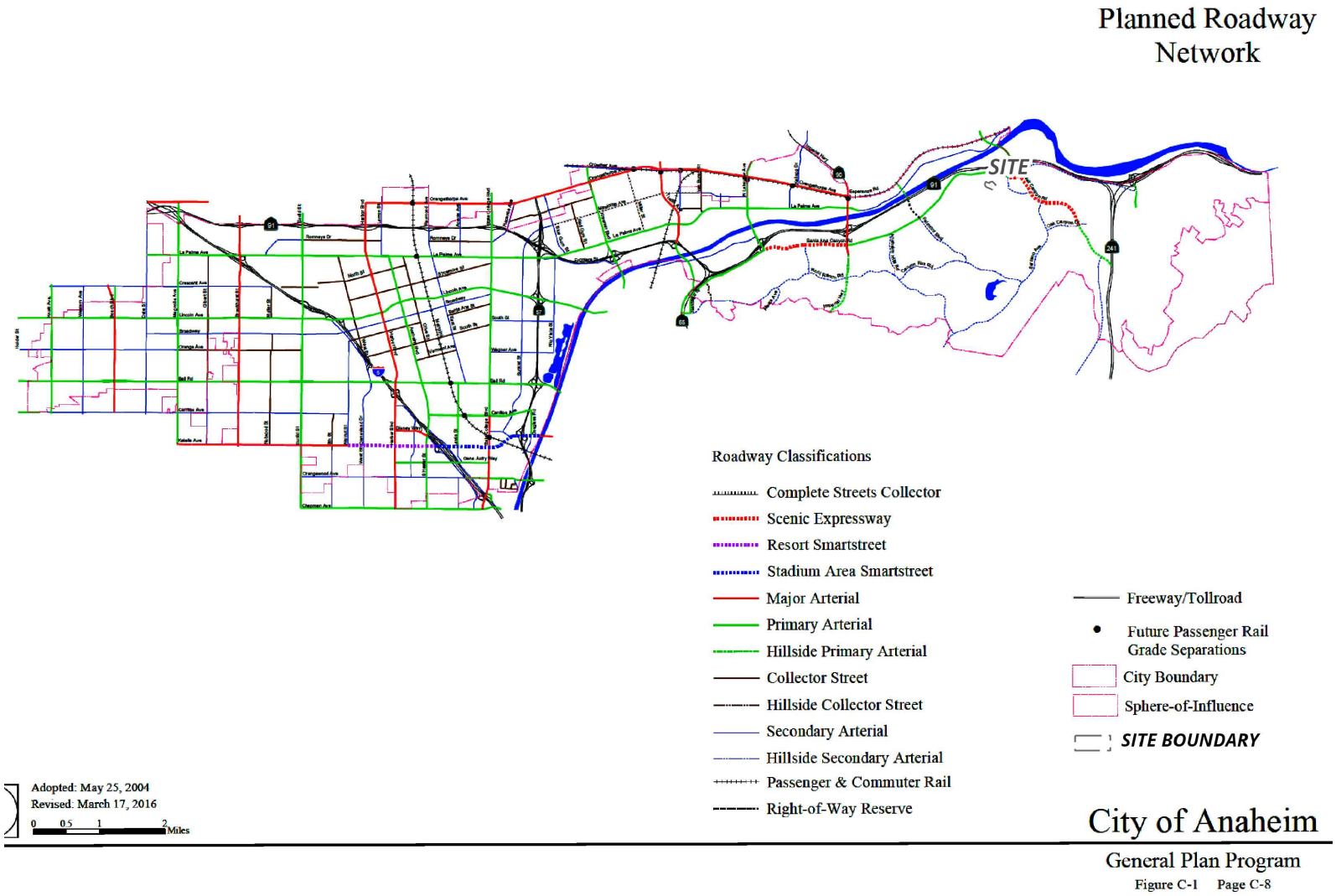


LEGEND

- = Existing Intersection Analysis Location
- = Future Intersection Analysis Location
- 2 = Number of Lanes
- D = Divided
- U = Undivided
- = Speed Limit (MPH)
- = School Zone Speed Limit (MPH)
- = Traffic Signal
- = Stop Sign
- = Existing Traffic Lane
- FREE = Free Right Turn Lane
- TWLTL = Two-way Left Turn Lane
- RTO = Right Turn Overlap

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EXHIBIT 3-2 : CITY OF ANAHEIM GENERAL PLAN PLANNED ROADWAY MAP



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Imperial Highway is classified as a Major Arterial and currently exists within the study area with eight lanes, a raised median, no on-street parking, and a posted speed limit of 45 MPH north of SR-91 and 35 MPH south of SR-91.

Yorba Linda Boulevard is classified as a Primary Arterial north of SR-91 and exists within the study area with six lanes, a raised median, no on-street parking, and a posted speed limit of 40 MPH.

Anaheim Hills Road is classified as a Hillside Secondary Arterial and exists within the study area with four lanes south of Santa Ana Canyon Road, raised median, no on-street parking, and a posted speed limit of 35 MPH,

Fairmont Boulevard is classified as a Hillside Secondary Arterial and exists within the study area with two lanes, a raised median, no on-street parking, and a posted speed limit of 35 MPH.

Roosevelt Road is classified as a Hillside Secondary Arterial and exists within the study area with four lanes, a painted median, no on-street parking, and a posted speed limit of 25 MPH.

Monte Vista Road is classified as a Hillside Secondary Arterial and exists within the study area with four lanes, a painted median, no on-street parking, and a posted speed limit of 35 MPH.

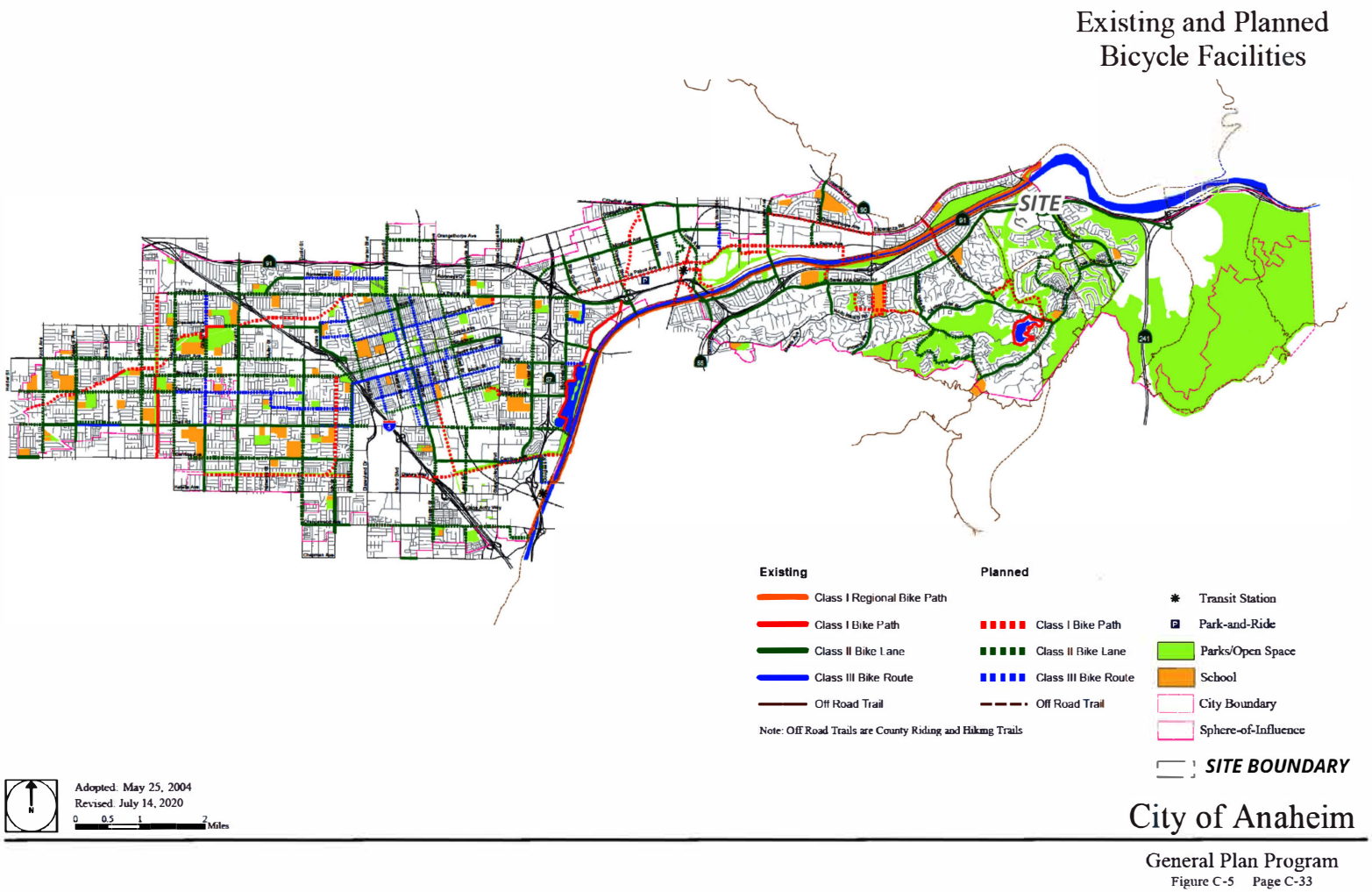
3.3 BICYCLE AND PEDESTRIAN FACILITIES

Exhibit 3-3 illustrates the City of Anaheim existing and planned bicycle facilities. As shown at Exhibit 3-3, there are existing Class II bike lanes on Santa Ana Canyon Road, Anaheim Hills Road south of Santa Ana Canyon Road, and Weir Canyon Road south of Santa Ana Canyon Road. There is a planned Class I bike path and a planned Class II bike lane along Fairmont Boulevard, north and south of Santa Ana Canyon Road respectively. Class II bike lanes are signed and striped bike lanes on the roadway. Existing pedestrian facilities within the study area are shown at Exhibit 3-4. As shown at Exhibit 3-4, there are existing pedestrian facilities along Festival Drive, Roosevelt Road, Monte Vista Road, Weir Canyon Road, and portions of Santa Ana Canyon Road in the vicinity of the Project site.

3.4 TRANSIT SERVICE

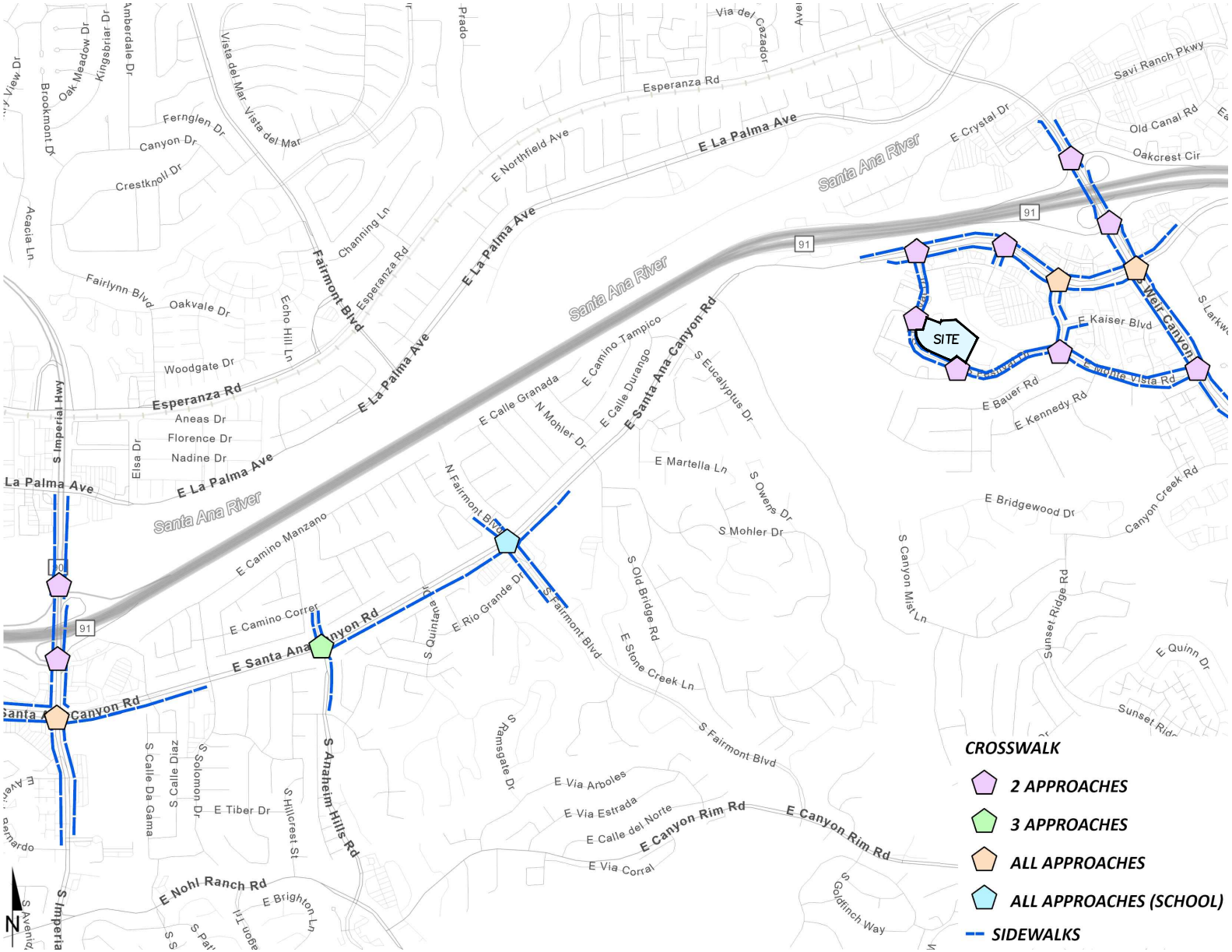
Exhibit 3-5 shows the City of Anaheim transit facilities. The study area within the City of Anaheim is currently served by OCTA, a public transit agency serving various jurisdictions within Orange County. The closest OCTA transit routes (Route 30 and 38) run north of SR-91 with the nearest bus stop located at Imperial Highway and La Palma Avenue. Transit service is reviewed and updated by OCTA periodically to address ridership, budget, and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

EXHIBIT 3-3 : CITY OF ANAHEIM EXISTING AND PLANNED BICYCLE FACILITIES



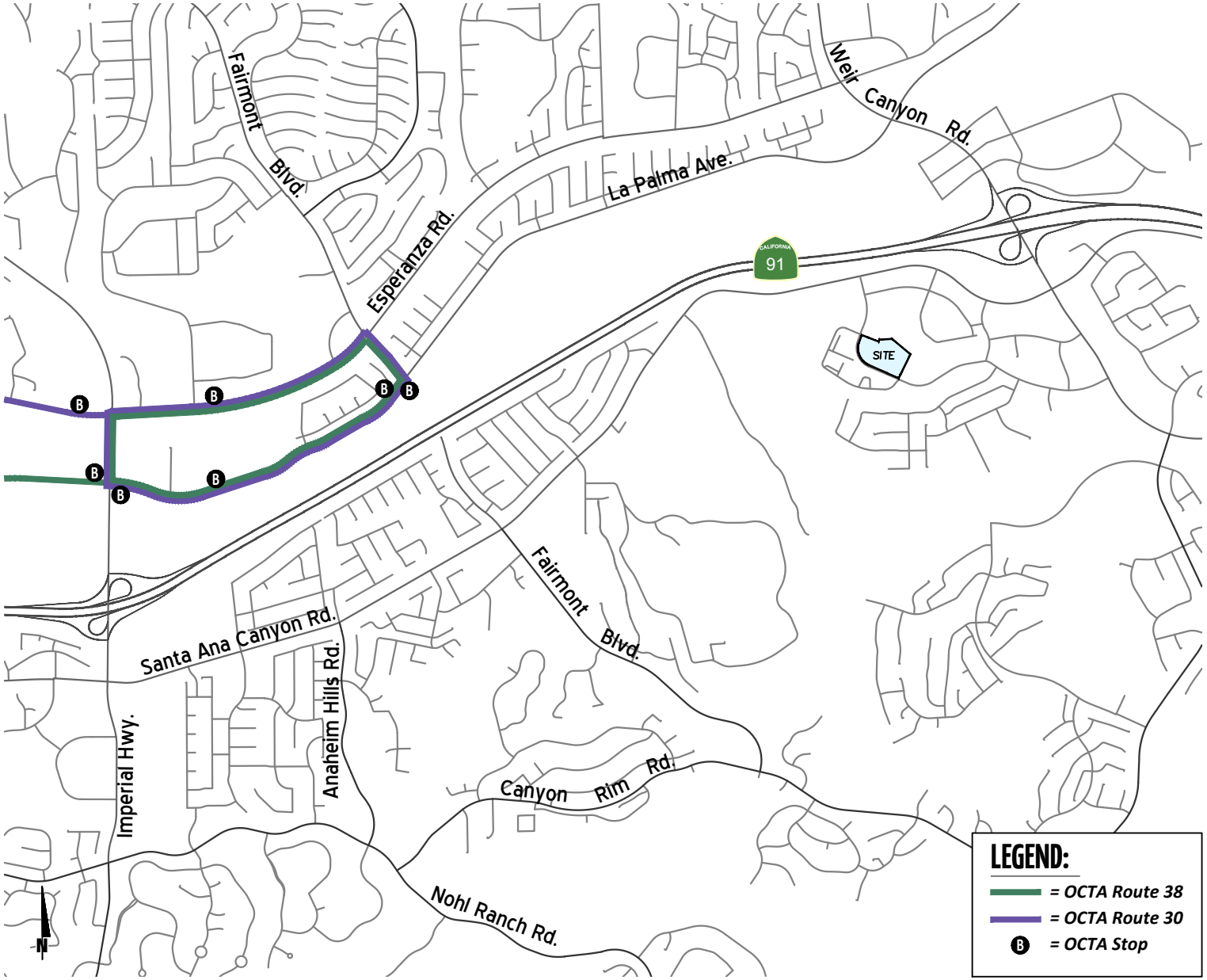
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EXHIBIT 3-4 : CITY OF ANAHEIM EXISTING PEDESTRIAN FACILITIES



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EXHIBIT 3-5 : CITY OF ANAHEIM TRANSIT FACILITIES



3.5 EXISTING TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in November 2023 and January 2024. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

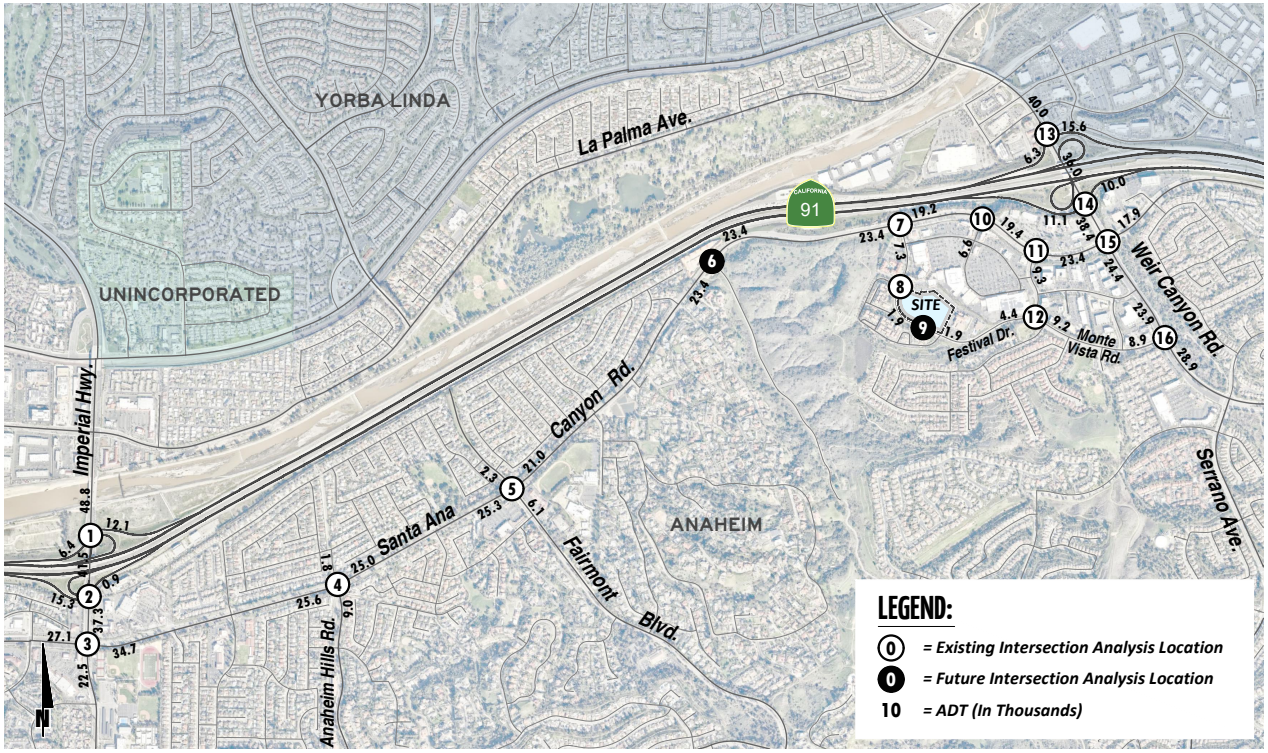
The existing weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. A comparison of historical traffic counts from September 2022 to traffic counts collected in November 2023 at four study area intersections showed a nominal growth factor. Given the short time span of only two months between the November 2023 and January 2024 data collection periods and the minimal growth factor observed, no growth was applied to establish the baseline condition. The existing weekday AM and weekday PM peak hour count data has been adjusted in some cases to achieve flow conservation between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles.

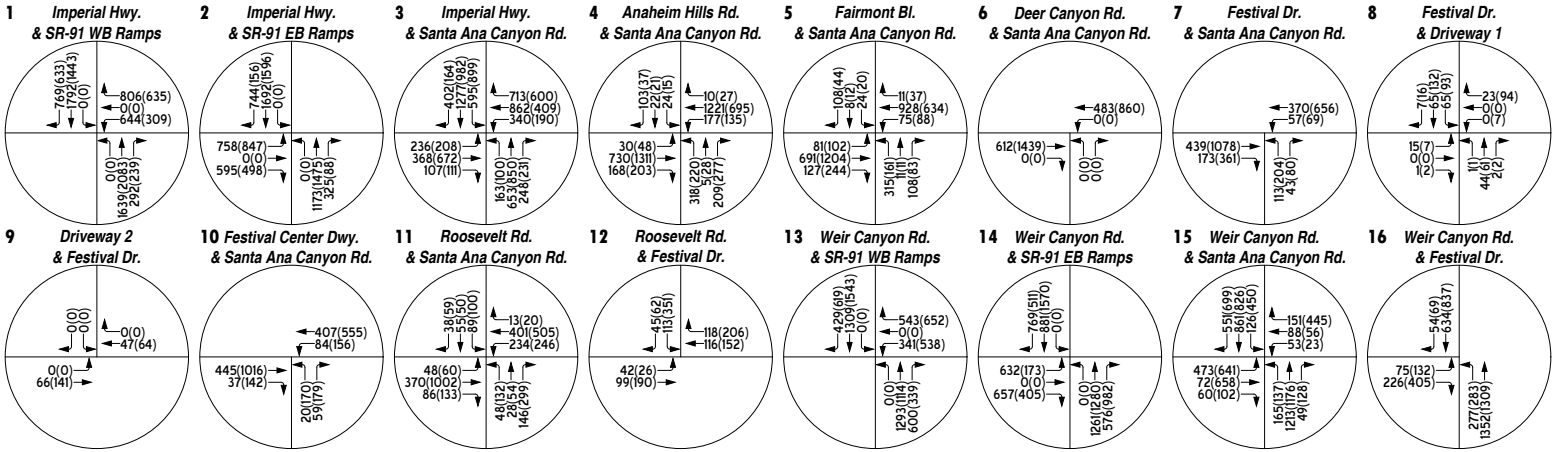
The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. Existing weekday ADT volumes are shown at Exhibit 3-6. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 10.2 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 9.82 percent. As such, the above equation utilizing a factor of 10.2 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of 9.82 percent (i.e., 1/0.0982 = 10.2) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday and weekend peak hour intersection volumes are also shown at Exhibit 3-6.

EXHIBIT 3-6 : EXISTING (2024) TRAFFIC VOLUMES





3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1, which indicates that the study area intersections are currently operating at an acceptable LOS during the peak hours. The delays and V/C reported at each study area intersection is based on an average of the overall intersection, as opposed to reporting of deficiencies to specific turning movements at an intersection. In other words, although intersections may have one or two movements that experience queuing/congestion, the effects are averaged against the operations of other movements at the intersection. The area of Santa Ana Canyon Road experiences congestion/queuing, especially going to the east of Weir Canyon Road which is attributable to commute traffic bypassing the SR-91 Freeway during the afternoon peak period. Queuing and operational deficiencies for specific turning movements may not have feasible improvements as the deficiencies are being caused by regional commute traffic associated with the congestion on the SR-91 Freeway and providing those improvements could potentially encourage additional traffic through the area. Additionally, periodic queues were observed within the study area during the morning peak hour near existing schools. It is common for intersections in close proximity to educational facilities to experience queues during morning drop-off and afternoon pick-up periods. These queues typically last 15-20 minutes during the morning commute peak hour. The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

3.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. There are no unsignalized study area intersections that currently meet a traffic signal warrant under Existing (2024) traffic conditions. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 ROADWAY SEGMENT ANALYSIS

The roadway capacities utilized for the study area roadway segment analysis are obtained from the OCTA Guidance of Administration of the Orange County MPAH and the County of Orange TIM. These roadway segment capacities are approximate figures only and are used to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2024) conditions roadway segment capacity analysis. As shown in Table 3-2, all of the study area roadway segments are currently operating at an acceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria.

3.9 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Existing (2024) traffic conditions are presented in Table 3-3. As shown in Table 3-3, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Existing (2024) traffic conditions. Worksheets for Existing (2024) traffic conditions queuing analysis are provided in Appendix 3.4.

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2024) CONDITIONS

#	Intersection	Traffic Control [3]	Evaluation Methodology	Delay[1] (secs.) ICU (v/c)[2] AM	PM	Level of Service AM	PM
1	Imperial Hwy. & SR-91 WB Ramps	TS	HCM	13.8	9.2	B	A
			ICU	0.686	0.543	B	A
2	Imperial Hwy. & SR-91 EB Ramps	TS	HCM	12.8	11.2	B	B
			ICU	0.564	0.548	A	A
3	Imperial Hwy. & Santa Ana Canyon Rd.	TS	ICU	0.640	0.714	B	C
4	Anaheim Hills Rd. & Santa Ana Canyon Rd.	TS	ICU	0.610	0.700	B	B
5	Fairmont Bl. & Santa Ana Canyon Rd.	TS	ICU	0.531	0.538	A	A
6	Deer Canyon Rd. & Santa Ana Canyon Rd.			Future Intersection			
7	Festival Dr. & Santa Ana Canyon Rd.	TS	ICU	0.219	0.362	A	A
8	Festival Dr. & Driveway 1	CSS	HCM	10.2	10.9	B	B
9	Driveway 2 & Festival Dr.			Future Intersection			
10	Festival Center Dwy. & Santa Ana Canyon Rd.	TS	ICU	0.197	0.400	A	A
11	Roosevelt Rd. & Santa Ana Canyon Rd.	TS	ICU	0.295	0.484	A	A
12	Roosevelt Rd. & Festival Dr./Monte Vista Rd.	TS	ICU	0.176	0.258	A	A
13	Weir Canyon Rd. & SR-91 WB Ramps	TS	HCM	8.4	10.2	A	B
			ICU	0.480	0.586	A	A
14	Weir Canyon Rd. & SR-91 EB Ramps	TS	HCM	11.0	6.4	B	
			ICU	0.550	0.477	A	A
15	Weir Canyon Rd. & Santa Ana Canyon Rd.	TS	ICU	0.508	0.732	A	C
16	Weir Canyon Rd. & Monte Vista Rd.	TS	ICU	0.404	0.500	A	A

[1] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

[2] All signalized intersections are evaluated utilizing Intersection Capacity Utilization (ICU) methodology, reported as a volume-to-capacity ratio. For intersections with all way or cross street stop control, the HCM delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Signalized intersections within Caltrans jurisdiction will be evalutaed utilizing both HCM and ICU methodology.

[3] TS = Traffic Signal; CSS = Cross-street Stop

TABLE 3-2: ROADWAY SEGMENT ANALYSIS FOR EXISTING (2024) CONDITIONS

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing (2024) 2024	V/C[2]	LOS[3]	Acceptable LOS[4]
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	5D	46,875	34,691	0.740	C	C
2		Anaheim Hills Rd. to Fairmont Bl.	4D	37,500	25,273	0.674	B	C
3		Fairmont Bl. to Deer Canyon Rd.	4D	37,500	22,989	0.613	B	C
4		Deer Canyon Rd. Festival Dr.	4D	37,500	22,989	0.613	B	C
5		Festival Dr. to Roosevelt Rd.	6D	56,250	18,829	0.335	A	C
6		Roosevelt Rd. to Weir Canyon Rd.	6D	56,250	22,929	0.408	A	C
7	Roosevelt Rd.	Santa Ana Canyon Rd. to Festival Dr.	4D	25,000	9,139	0.366	A	C
8	Festival Dr.	Santa Ana Canyon Rd. to Driveway 1	2D	22,000	7,140	0.325	A	C
9		Driveway 2 to Roosevelt Rd.	2D	22,000	4,300	0.195	A	C
10	Monte Vista Rd.	Roosevelt Rd. to Weir Canyon Rd.	4D	25,000	8,989	0.360	A	C
11	Weir Canyon Rd.	SR-91 Freeway to Santa Ana Canyon Rd.	6D	56,250	38,443	0.683	B	C
12		Santa Ana Canyon Rd. to Monte Vista Rd.	6D	56,250	23,919	0.425	A	C

[1] The volumes shown are based on LOS "E" roadway capacity as defined by the County of Orange Growth Management Plan.
[2] V/C = Volume to Capacity Ratio
[3] LOS = Level of Service
[4] The City of Anaheim roadway standard is LOS "C".

TABLE 3-3: PEAK HOUR QUEUING SUMMARY FOR EXISTING (2024) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet) AM Peak Hour	95th Percentile Queue (Feet) PM Peak Hour	Acceptable?[1] AM	Acceptable?[1] PM
1	Imperial Hwy. & SR-91 WB Ramps	WBL	1,280	371	243	Yes	Yes
		WBR	495	459	320	Yes	Yes
2	Imperial Hwy. & SR-91 EB Ramps	EBL	2,365	335	301	Yes	Yes
		EBR	510	403	360	Yes	Yes
13	Weir Canyon Rd. & SR-91 WB Ramps	WBL	1,580	178	312	Yes	Yes
		WBR	350	213	369 [3]	Yes	Yes
14	Weir Canyon Rd. & SR-91 EB Ramps	EBL	1,740	294	156	Yes	Yes
		EBR	225	338 [3]	206	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-91 mainline.

3.10 EXISTING DEFICIENCIES AND IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient under Existing (2024) traffic conditions in an effort to achieve an acceptable LOS.

3.10.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections currently operate at an acceptable LOS during the peak hours under Existing (2024) traffic conditions. As such, no improvements have been identified.

3.10.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT ROADWAY SEGMENTS

As shown in Table 3-2, there are no roadway segments currently operating at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under Existing (2024) traffic conditions. As such, no improvements have been identified.

3.10.3 IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUING DEFICIENCIES

There are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Existing (2024) traffic conditions. As such, no improvements have been identified.

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The existing SP is divided into four DAs by land use. DA 1 is the Scenic Commercial area fronting Santa Ana Canyon Road between Festival Drive and Roosevelt Road, DA 2 is the Regional Commercial use that contains the department stores, grocery, other food/retail uses, and the vacant cinema, DA 3 is the Visitor Commercial area located west of Festival Drive which includes the existing hotel, and DA 4 is the Senior Residential area south of Festival Drive. The proposed SPA proposes the implementation of a new 16.2-acre mixed-use development area on the upper level of the commercial center as a new DA 5 (which is a portion of the old DA 2).

Specifically, the Project proposes to demolish the existing 62,676-square-foot vacant cinema and develop, in its place, 447 multi-family residential dwelling units while retaining the remaining existing commercial uses within the new DA 5. Approximately 13,310 square feet of existing retail would be retained in DA 2 as a result of the new DA 5 (resulting in a net reduction of 49,366 square feet of retail space). The retail within DA 5 will include the following existing uses: 6,475 square feet of restaurant use, 9,200 square feet of office use, 38,160-square-foot fitness/gym, 13,276 square feet of tutor/retail space, and 11,033-square-foot medical office building. The Project will be developed within a single phase for the purposes of the Traffic Analysis with an anticipated Opening Year of 2029.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to, and produced by, a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to, and produced by, the specific land uses being proposed for a given development.

The trip generation rates used for the proposed Project are based upon information collected by the ITE as provided in their latest Trip Generation Manual, 11th Edition, 2021. ITE Land Use Code 221 for Multifamily Housing (Mid-Rise, 4-10 Floors) has been used for the proposed Project (see Table 4-1). (2) The Project trip generation summary, illustrating daily and peak hour trip generation estimates for the Project based on the applicable ITE trip generation rates, is shown in Table 4-2. Only traffic for the proposed multi-family development is taken into consideration as the existing retail, restaurant, and office uses would be captured as part of the existing intersection traffic count program. However, given the proximity of the proposed residential to the adjacent existing uses within DA 1 and DA 2, the trip generation accounts for internal capture between these uses.

TABLE 4-1: PROJECT TRIP GENERATION RATES

Land Use[1]	ITE LU Code	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily (Mid-Rise) Residential	221	DU	0.09	0.28	0.37	0.24	0.15	0.39	4.54

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Eleventh Edition (2021).

[2] DU = Dwelling Units

TABLE 4-2: PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Multifamily (Mid-Rise) Residential	447	DU	38	127	165	106	68	174	2,030
Internal Capture (20% Reduction)[2]			-3	-30	-33	-21	-14	-35	-406
Total Project Trips			**35**	**97**	**132**	**85**	**54**	**139**	**1,624**

[1] DU = Dwelling Units

[2] Internal capture of residential to the adjacent existing restaurant, food, retail, and medical office uses per NCHRP 684.

Internal capture is a percentage reduction that can be applied to the vehicle trip generation estimates for individual land uses to account for trips internal to a site (trips that travel between uses without leaving the site). In other words, trips may be made between the existing retail, restaurant, and office uses and the proposed multi-family residential use on-site which can be made either by walking or using internal roadways without using external streets. An internal capture reduction was applied to recognize the interactions that would occur between the various complementary land uses within the SP. The internal capture is based on the National Cooperative Highway Research Program's (NCHRP Report 684) internal trip capture estimation tool. These internal capture worksheets are provided in Attachment A of the scoping agreement (Appendix 1.1). For the purposes of the Traffic Study, the internal capture will be limited to 20%, consistent with the AM peak hour internal capture (although the PM peak hour worksheets reflect up to 67%).

As shown in Table 4-2, the Project is anticipated to generate 1,624 two-way trips per day with 132 AM peak hour trips and 139 PM peak hour trips.

As noted previously, the 62,676-square-foot cinema on the site is currently vacant. The proposed Project will redevelop the site to replace the existing cinema use with 447 multi-family (mid-rise) residential dwelling units and 13,310 square feet of future retail space retained in DA 2. In order to conduct a conservative analysis, no trip credit will be taken for the existing vacant use. However, the net change in trip generation between the multi-family residential, the existing cinema, and the future retail space to be added is summarized in Table 4-3 for informational purposes. As shown on Table 4-3, the proposed Project is anticipated to generate a net increase in trips during the AM peak hour but would result in a net reduction of 532 two-way trips per day and 33 PM peak hour trips.

TABLE 4-3: TRIP GENERATION COMPARISON

Trip Generation Comparison	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Multifamily (Mid-Rise) Residential	38	127	165	106	68	174	2,030
Future Retail Space (13,310 SF)	1	0	1	2	2	3	38
Cinema (Vacant)[2]	0	0	0	-145	-65	-210	-2,600
Net Change in Trips	**39**	**127**	**166**	**-37**	**5**	**-33**	**-532**

[1] DU = Dwelling Units; TSF = Thousand Square Feet

[2] Source: Anaheim Hills Festival Traffic and Parking Study, dated January 29, 1990, prepared by Weston Pringle & Associates.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. Exhibit 4-1 illustrates the Project trip distribution patterns for the Project. The Project trip distribution patterns are based on existing travel patterns.

4.3 MODAL SPLIT

The potential for Project trips to be reduced by the use of public transit, walking, or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project weekday ADT and weekday peak hour intersection turning movement volumes are shown at Exhibit 4-2.

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 1 percent per year, compounded annually, for 2029 traffic conditions. The total ambient growth is 5.10 percent for 2029 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in conjunction with traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. 2029 traffic volumes are provided in Sections 5 and 6 of this report. The traffic generated by the proposed Project was then manually added to the base volume to determine With Project forecasts.

EXHIBIT 4-1 : PROJECT TRIP DISTRIBUTION

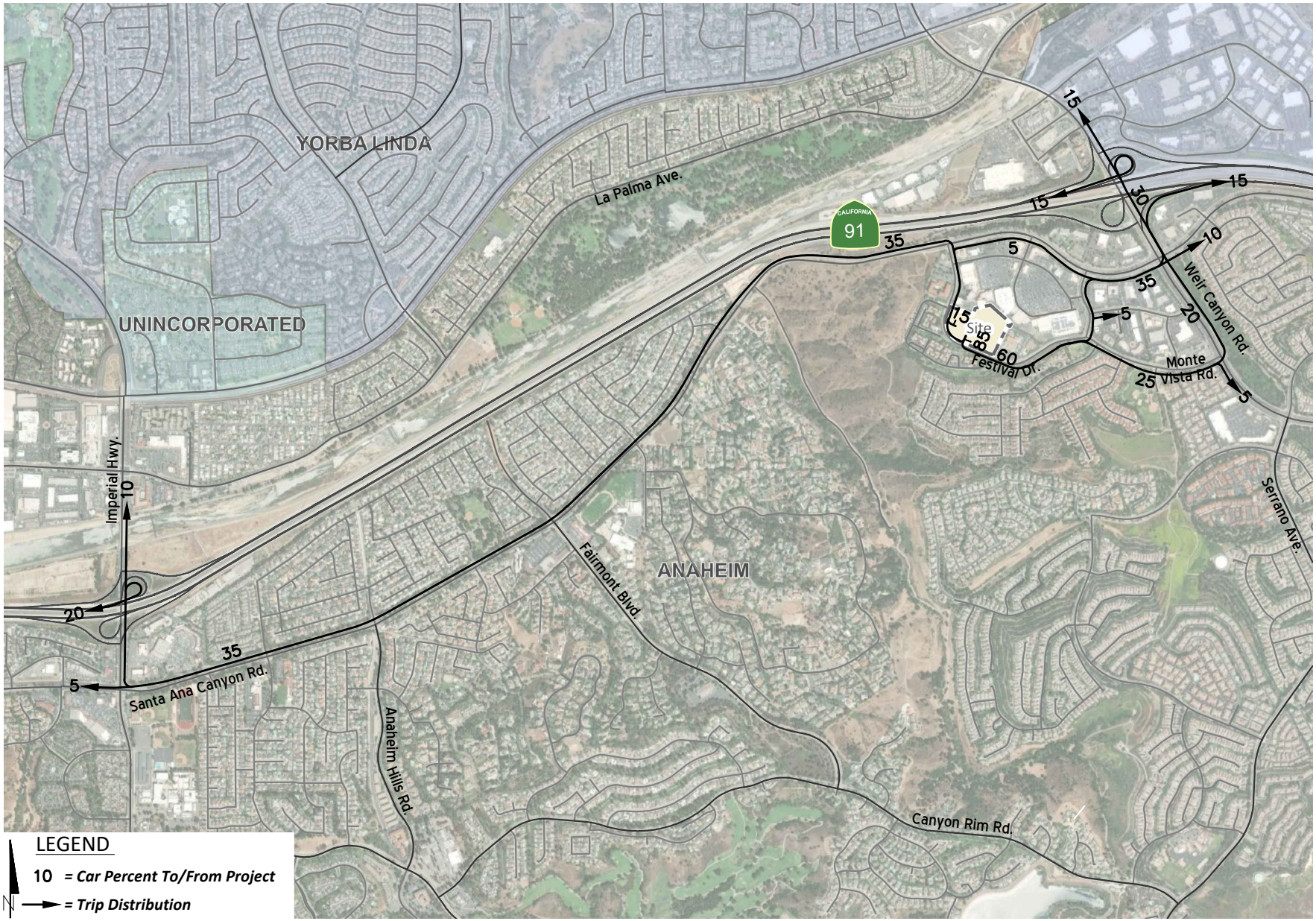
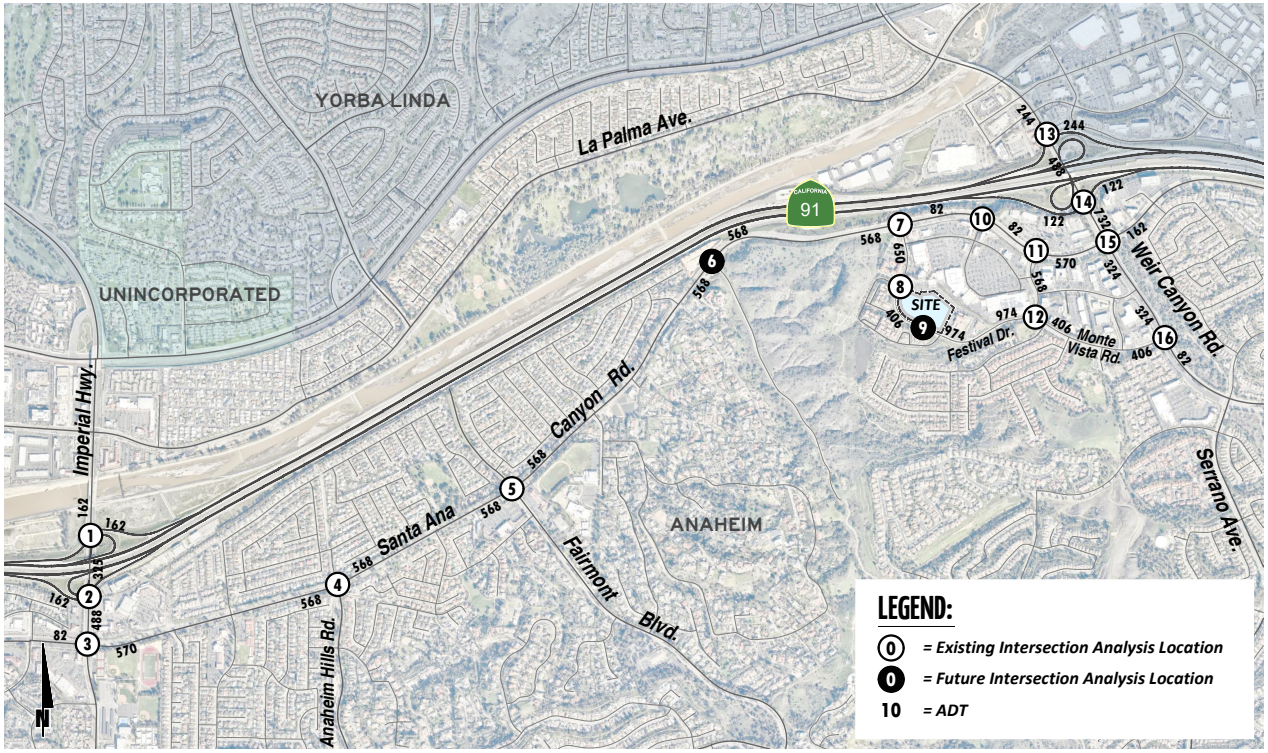
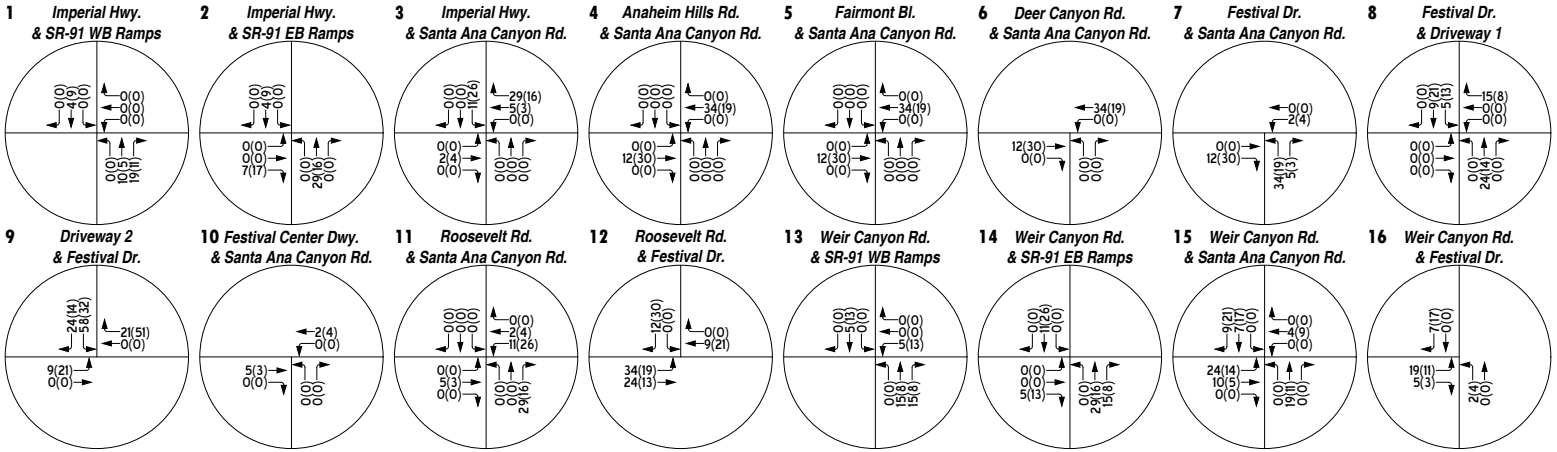


EXHIBIT 4-2 : PROJECT ONLY TRAFFIC VOLUMES





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4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Anaheim. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-3 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-4. Consistent with the City's traffic study guidelines, traffic from approved cumulative development projects was added to the Opening Year (2029) Without Project traffic forecasts and traffic from both pending and approved cumulative development projects were added to the Future Conditions (2029) traffic forecasts. In an effort to conduct a conservative analysis, the cumulative projects are added in conjunction with the ambient growth identified in Section 4.5 *Background Traffic*.

The trip generation rates used for the cumulative projects are based upon information collected by the ITE as provided in their latest Trip Generation Manual, 11th Edition, 2021 (See Table 4-5). The cumulative project trip generation summary, illustrating daily and peak hour trip generation estimates for the cumulative projects based on the applicable ITE trip generation rates, is shown in Table 4-6. It should be noted that the trip generations for cumulative projects A1, A11, and Y1 were pulled directly from their respective traffic analyses reports. Cumulative Only ADT and peak hour intersection turning movement volumes are shown at Exhibit 4-4.

TABLE 4-4: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

No.	Project Name / Case Number	Land Use	Quantity	Units[1]	Location
A1	The Hills Preserve Project	Multi-Family Residential	498	DU	S of Santa Ana Canyon Road,
		Single-Family Residential	6	DU	N. of Deer Canyon Park,
		Non-Resident Amenity Access	12.700	TSF	between S. Eucalyptus Drive &
		Commercial	80.000	TSF	Festival Drive
		Open Space & Trails	43.2	AC	
A2	DEV2022-00055	Industrial	94.540	TSF	180 N Riverside Drive
A3	DEV2021-00046	Retail Plaza	5.315	TSF	8163 E Kaiser Boulevard
	DEV2013-00024C	Preschool	43	STU	
A4	DEV2022-00044	RV Storage	160	Spaces	S of Crystal Drive & W of Pullman Street
A5	DEV2020-00204	Cemetery	180.0	AC	APN 51401235
A6	DEV2020-00097	Single-Family Residential	4	DU	6268 E Rio Grande Drive
A7	DEV2022-00063	Warehouse	87.912	TSF	5510 E La Palma Avenue
A8	DEV2022-00030	Multi-Family Residential	360	DU	4679 E Orchard Drive
A9	DEV2019-00151	Single-Family Residential	4	DU	6140 E Santa Ana Canyon Road
A10	DEV2020-00096	Warehouse	169.000	TSF	3939 E Coronado Street
A11	DEV2021-00057	General Light Industrial	38.251	TSF	3855 E La Palma Avenue
A12	DEV2021-00073	Single-Family Residential	3	DU	860 S Peralta Hills Drive
Y1	ECTO Homes	Senior Housing	240	DU	SEC of Mariposa & Lakeview

[1] AC = Acres; DU = Dwelling Units; STU = Students; TSF = Thousand Square Feet

TABLE 4-5: CUMULATIVE DEVELOPMENT TRIP GENERATION RATES

Land Use[1]	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
General Light Industrial	110	TSF	0.651	0.089	0.740	0.091	0.559	0.650	4.870
Passenger Cars (AM=98.6%, PM=99.4%, Daily=94.9%)			0.645	0.085	0.730	0.086	0.554	0.640	4.620
Trucks			0.006	0.004	0.010	0.005	0.005	0.010	0.250
Strip Retail Plaza (<40k)	822	TSF	1.42	0.94	2.36	3.30	3.30	6.59	54.45
Day Care Center	565	STU	0.41	0.37	0.78	0.37	0.42	0.79	4.09
Mini-Warehouse (RV Parking)	151	Spaces	0.01	0.01	0.01	0.01	0.01	0.02	0.18
Cemetery	566	AC	0.14	0.03	0.17	0.14	0.32	0.46	6.02
Single-Family Residential	210	DU	0.18	0.52	0.70	0.59	0.35	0.94	9.43
Warehousing	150	TSF	0.131	0.039	0.170	0.050	0.130	0.180	1.710
Passenger Cars (AM=88.2%, PM=83.3%, Daily=64.9%)			0.120	0.030	0.150	0.034	0.116	0.150	1.110
Trucks			0.011	0.009	0.020	0.016	0.014	0.030	0.600
Multi-Family Residential	220	DU	0.10	0.30	0.40	0.32	0.19	0.51	6.74

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Eleventh Edition (2021).

[2] AC = Acres; DU = Dwelling Units; STU = Students; TSF = Thousand Square Feet

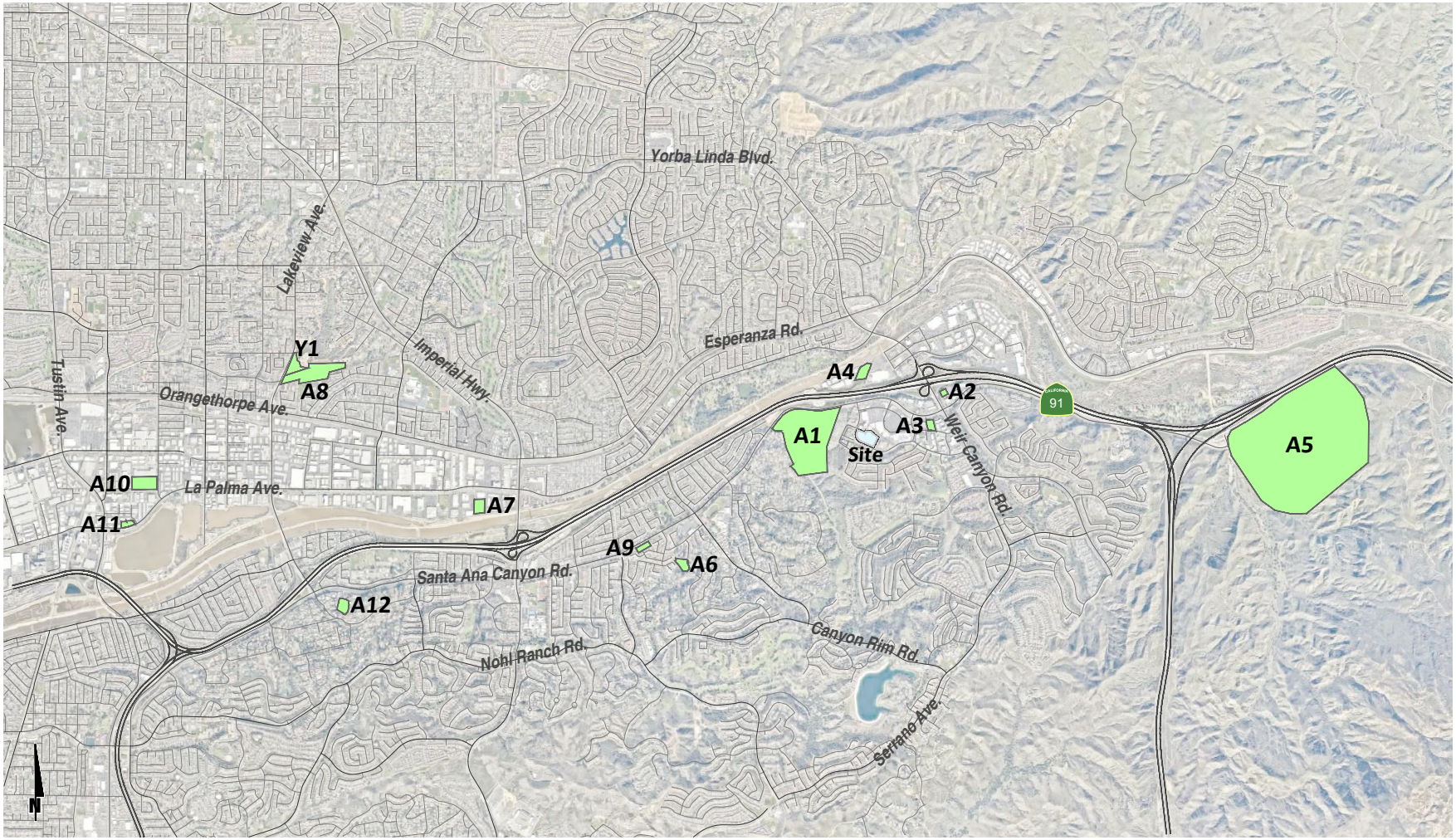
TABLE 4-6: CUMULATIVE DEVELOPMENT TRIP GENERATION SUMMARY

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
A1 - Mixed-Use[2]	--	--	159	168	327	167	192	359	3,623
A2 - Industrial	34.46	TSF							
Passenger Cars (AM=98.6%, PM=99.4%, Daily=94.9%)			22	3	25	3	19	22	160
Trucks			0	0	0	0	0	0	10
A3 - Retail Plaza	5.315	TSF	8	5	13	18	18	36	290
A3 - Preschool	43	STU	18	16	34	16	18	34	176
A4 - RV Storage	160	Spaces	1	1	2	1	1	2	30
A5 - Cemetery	180.0	AC	24	6	30	26	57	83	1,084
A6 - Single-Family Residential	4	DU	1	2	3	2	1	3	38
A7 - Warehousing	55.662	TSF	7	2	9	3	7	10	96
Passenger Cars (AM=88.2%, PM=83.3%, Daily=64.9%)			7	2	9	2	6	8	62
Trucks			1	1	2	1	1	2	34
A8 - Multi-Family Residential	360	DU	35	109	144	116	68	184	2,426
A9 - Single-Family Residential	4	TSF	1	2	3	2	1	3	38
A10 - Warehouse	169.000	TSF	22	7	29	9	22	31	290
A11 - General Light Industrial[2]	38.251	TSF							
Passenger Cars			25	3	28	3	21	24	178
Trucks			0	0	0	0	0	0	10
A12 - Single-Family Residential	3	DU	1	2	3	2	1	3	28
Y1 - Senior Living[2]	240	DU/Beds	22	11	33	31	29	60	599

[1] AC = Acres; DU = Dwelling Units; STU = Students; TSF = Thousand Square Feet

[2] The trip generation has been pulled directly from the project's traffic analysis report.

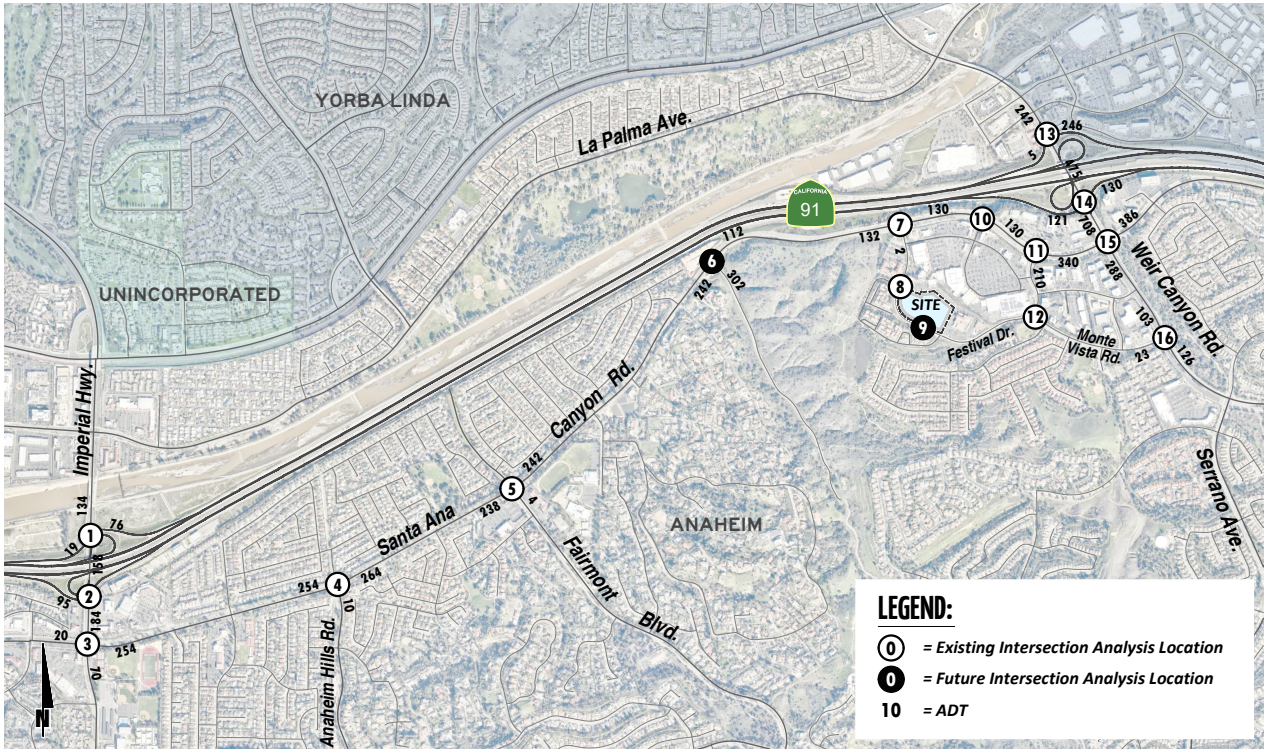
EXHIBIT 4-3 : CUMULATIVE DEVELOPMENT LOCATION MAP

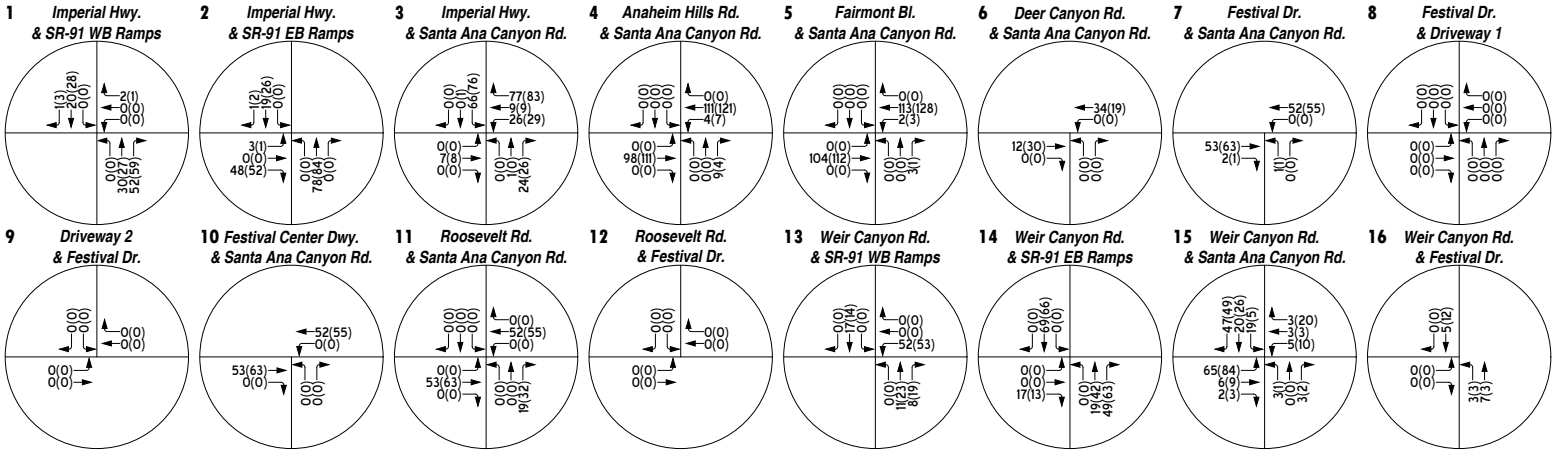


LEGEND:

= Cumulative Development Sites

EXHIBIT 4-4 : CUMULATIVE ONLY TRAFFIC VOLUMES





4.7 NEAR-TERM TRAFFIC CONDITIONS

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast Opening Year (2029) traffic conditions. An ambient growth factor accounts for background (area-wide) traffic increases that occur over time up to the year 2029 from the year 2024. Traffic volumes generated by the Project are then added to assess the near-term traffic conditions. The 2029 roadway networks are similar to the Existing conditions roadway network, with the exception of future driveways proposed to be developed by the Project. The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Opening Year (2029) Without Project Conditions
    - Existing 2024 counts
    - Ambient growth traffic (5.10%)
    - Approved Cumulative Development Traffic
- Opening Year (2029) With Project Conditions
    - Existing 2024 counts
    - Ambient growth traffic (5.10%)
    - Approved Cumulative Development Traffic
    - Project traffic

4.8 GENERAL PLAN BUILDOUT VOLUME DEVELOPMENT

Traffic projections for General Plan Buildout Without Project conditions were derived from the ATAM using accepted procedures for model forecast refinement and smoothing for study area intersections located within the City of Anaheim. The traffic forecasts reflect the area-wide growth anticipated in the City's General Plan or implied by the City's Zoning Ordinance.

The General Plan Buildout Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis. Project traffic was then added for all With Project traffic conditions. The long-range traffic forecasts were developed by the City's traffic consultant and are included in Appendix 4.1.

5 OPENING YEAR (2029) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year (2029) conditions and the resulting intersection operations and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year (2029) conditions are consistent with those shown previously at Exhibit 3-1, with the exception of the following:

- Deer Canyon Road is assumed to be constructed to provide site access by the Hills Preserve Project. The intersection of Deer Canyon Road and Santa Ana Canyon Road (#6) is assumed to be a signalized intersection.
- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year (2029) With Project conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 OPENING YEAR (2029) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes with the application of a 5.10 percent growth adjustment factor plus the addition of traffic generated by approved cumulative development projects. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year (2029) Without Project traffic conditions are shown at Exhibit 5-1.

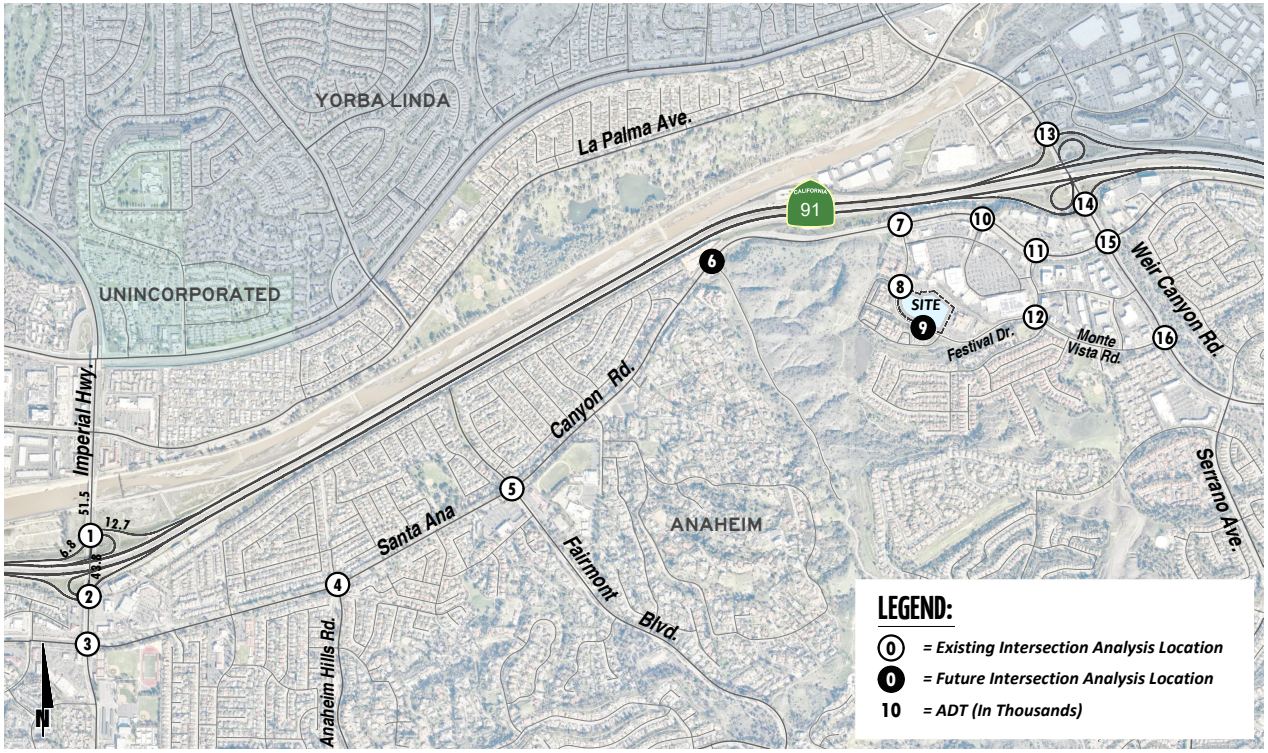
5.3 OPENING YEAR (2029) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes with the application of a 5.10 percent growth adjustment factor plus the addition of traffic generated by approved cumulative development projects plus the addition of traffic generated by the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year (2029) With Project traffic conditions are shown at Exhibit 5-2.

5.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year (2029) Without Project peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1 for Opening Year (2029) Without Project traffic conditions, which indicates that the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under Opening Year (2029) traffic conditions, consistent with Existing (2024) traffic conditions. The intersection operations analysis worksheets for Opening Year (2029) Without Project and With Project traffic conditions are included in Appendices 5.1 and 5.2, respectively.

EXHIBIT 5-2 : E+A+A (2029) TRAFFIC VOLUMES



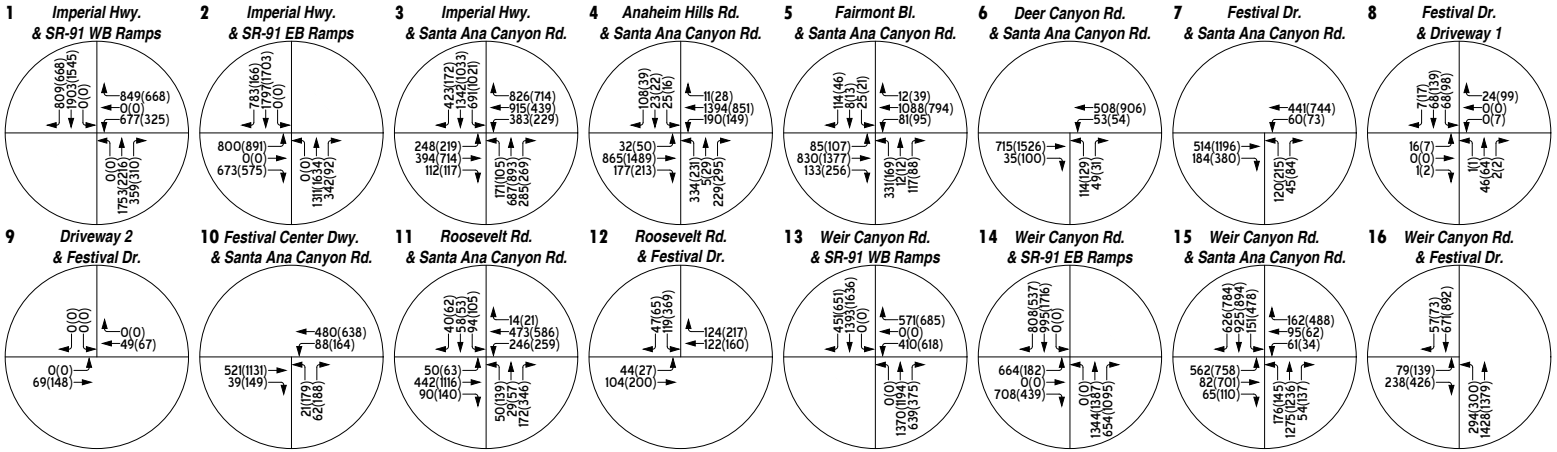
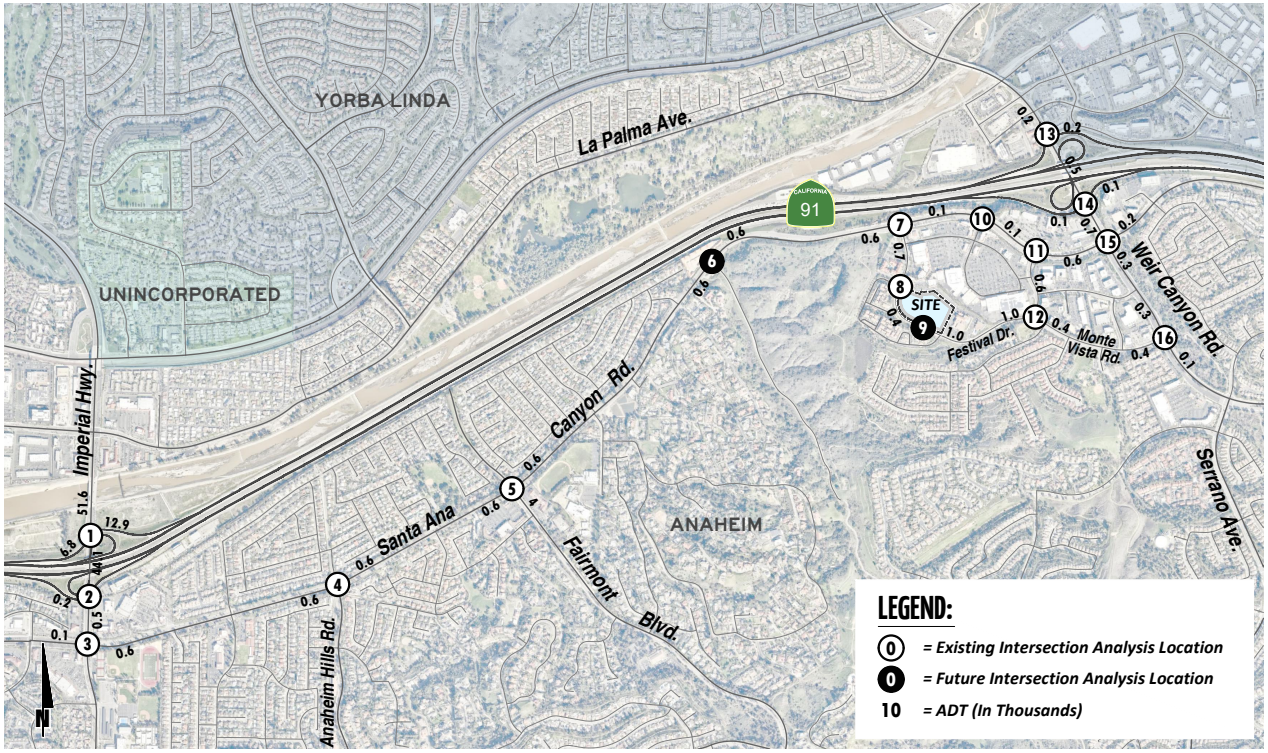


EXHIBIT 5-2 : E+A+A+P (2029) TRAFFIC VOLUMES



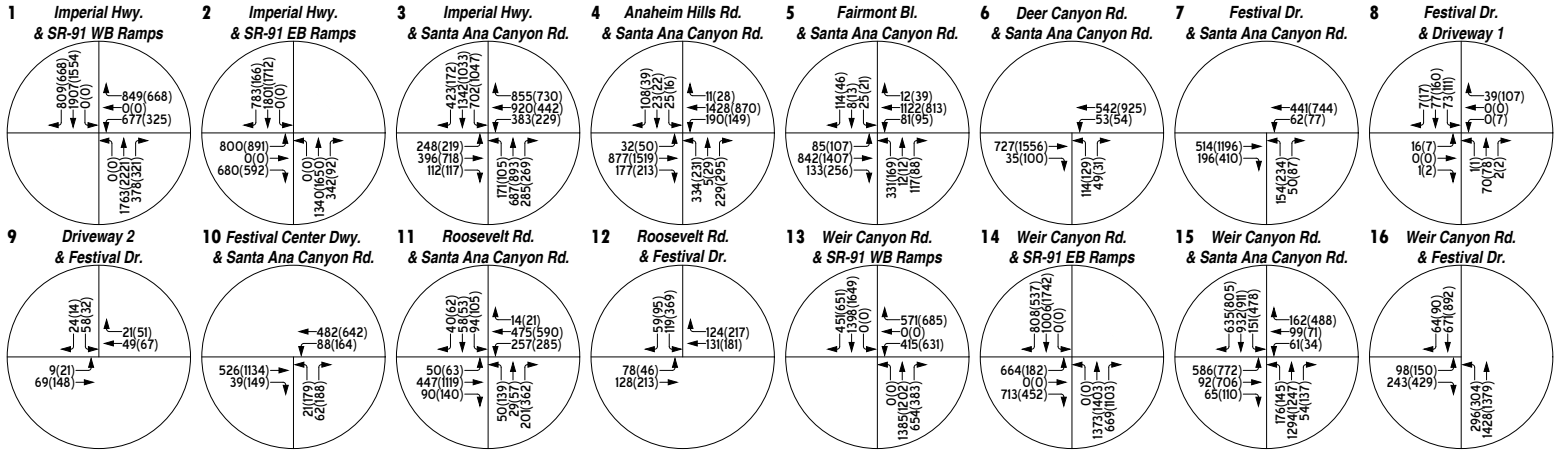


TABLE 5-1: INTERSECTION ANALYSIS FOR OPENING YEAR (2029) CONDITIONS

#	Intersection	Traffic Control [3]	Evaluation Methodology	Opening Year (2029) Without Project Delay[1] (secs.) ICU (v/c)[2] AM	PM	Level of Service AM	PM	With Project Delay[1] (secs.) ICU (v/c)[2] AM	PM	Level of Service AM	PM	Project-Related Increase in V/C AM	PM
1	Imperial Hwy. & SR-91 WB Ramps	TS	HCM	15.4	10.0	B	B	15.5	10.1	B	B	--	--
			ICU	0.722	0.572	C	A	0.723	0.573	C	A	0.001	0.001
2	Imperial Hwy. & SR-91 EB Ramps	TS	HCM	14.6	12.7	B	B	14.7	12.9	B	B	--	--
			ICU	0.603	0.588	B	A	0.605	0.593	B	A	0.002	0.005
3	Imperial Hwy. & Santa Ana Canyon Rd.	TS	ICU	0.696	0.785	B	C	0.700	0.794	C	C	0.004	0.009
4	Anaheim Hills Rd. & Santa Ana Canyon Rd.	TS	ICU	0.677	0.772	B	C	0.687	0.781	B	C	0.010	0.009
5	Fairmont Bl. & Santa Ana Canyon Rd.	TS	ICU	0.589	0.597	A	A	0.599	0.606	A	B	0.010	0.009
6	Deer Canyon Rd. & Santa Ana Canyon Rd.	TS	ICU	0.359	0.606	A	B	0.362	0.615	A	B	0.003	0.009
7	Festival Dr. & Santa Ana Canyon Rd.	TS	ICU	0.229	0.391	A	A	0.247	0.405	A	A	0.018	0.014
8	Festival Dr. & Driveway 1	CSS	HCM	10.3	11.0	B	B	10.6	11.5	B	B	--	--
9	Driveway 2 & Festival Dr.	CSS	HCM	Future Intersection				9.5	9.8	A	A	--	--
10	Festival Center Dwy. & Santa Ana Canyon Rd.	TS	ICU	0.215	0.431	A	A	0.215	0.431	A	A	0.000	0.000
11	Roosevelt Rd. & Santa Ana Canyon Rd.	TS	ICU	0.329	0.537	A	A	0.346	0.548	A	A	0.017	0.011
12	Roosevelt Rd. & Festival Dr./Monte Vista Rd.	TS	ICU	0.183	0.276	A	A	0.208	0.292	A	A	0.025	0.016
13	Weir Canyon Rd. & SR-91 WB Ramps	TS	HCM	9.4	11.6	A	B	9.4	11.8	A	B	--	--
			ICU	0.480	0.626	A	B	0.517	0.631	A	B	0.037	0.005
14	Weir Canyon Rd. & SR-91 EB Ramps	TS	HCM	12.1	6.9	B	A	12.3	7.1	B	A	--	--
			ICU	0.583	0.516	A	A	0.589	0.525	A	A	0.006	0.009
15	Weir Canyon Rd. & Santa Ana Canyon Rd.	TS	ICU	0.557	0.799	A	C	0.568	0.806	A	D	0.011	0.007
16	Weir Canyon Rd. & Monte Vista Rd.	TS	ICU	0.425	0.527	A	A	0.427	0.530	A	A	0.002	0.003

[1] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

[2] All signalized intersections are evaluated utilizing Intersection Capacity Utilization (ICU) methodology, reported as a volume-to-capacity ratio. For intersections with all way or cross street stop control, the HCM delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Signalized intersections within Caltrans jurisdiction will be evalutaed utilizing both HCM and ICU methodology.

[3] TS = Traffic Signal; CSS = Cross-street Stop; TS = Improvement

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for Opening Year (2029) traffic conditions is based on the peak hour volumes or planning level ADT volume-based traffic signal warrants. The following unsignalized study area intersection is anticipated to meet a traffic signal warrant under Opening Year (2029) Without Project traffic conditions (see Appendix 5.3):

- Deer Canyon Road & Santa Ana Canyon Road (#6)

With the addition of Project traffic, there are no additional unsignalized study area intersections anticipated to meet a traffic signal warrant under Opening Year (2029) With Project traffic conditions (see Appendix 5.4).

5.6 ROADWAY SEGMENT ANALYSIS

The roadway capacities utilized for the study area roadway segment analysis are obtained from the OCTA Guidance of Administration of the Orange County MPAH and the County of Orange TIM. These roadway segment capacities are approximate figures only and are used to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 5-2 provides a summary of the Opening Year (2029) traffic conditions roadway segment capacity analysis. As shown in Table 5-2, the following study area roadway segment is anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under both Opening Year (2029) Without Project and With Project traffic conditions:

- Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road (#1) – LOS D

5.7 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year (2029) are presented in Table 5-3. As shown in Table 5-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under both the Opening Year (2029) traffic conditions. Worksheets for Opening Year (2029) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 5.5 and 5.6, respectively.

TABLE 5-2: ROADWAY SEGMENT ANALYSIS FOR OPENING YEAR (2029) CONDITIONS

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Without Project			With Project			Acceptable LOS[4]
					2029	V/C[2]	LOS[3]	2029	V/C[2]	LOS[3]	
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	5D	46,875	**38,816**	**0.828**	**D**	**39,386**	**0.840**	**D**	C
2		Anaheim Hills Rd. to Fairmont Bl.	4D	37,500	28,990	0.773	C	29,558	0.788	C	C
3		Fairmont Bl. to Deer Canyon Rd.	4D	37,500	26,633	0.710	C	27,201	0.725	C	C
4		Deer Canyon Rd. Festival Dr.	4D	37,500	25,364	0.676	B	25,932	0.692	B	C
5		Festival Dr. to Roosevelt Rd.	6D	56,250	20,964	0.373	A	21,046	0.374	A	C
6		Roosevelt Rd. to Weir Canyon Rd.	6D	56,250	25,483	0.747	C	26,051	0.764	C	C
7	Roosevelt Rd.	Santa Ana Canyon Rd. to Festival Dr.	4D	25,000	9,816	0.288	A	10,304	0.302	A	C
8	Festival Dr.	Santa Ana Canyon Rd. to Driveway 1	2D	22,000	7,532	0.221	A	8,182	0.240	A	C
9		Driveway 2 to Roosevelt Rd.	2D	22,000	4,519	0.205	A	5,493	0.250	A	C
10	Monte Vista Rd.	Roosevelt Rd. to Weir Canyon Rd.	4D	25,000	9,448	0.378	A	9,854	0.394	A	C
11	Weir Canyon Rd.	SR-91 Freeway to Santa Ana Canyon Rd.	6D	56,250	42,052	0.748	C	42,784	0.761	C	C
12		Santa Ana Canyon Rd. to Monte Vista Rd.	6D	56,250	25,467	0.453	A	25,791	0.459	A	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] The volumes shown are based on LOS "E" roadway capacity as defined by the County of Orange Growth Management Plan.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

[4] The City of Anaheim roadway standard is LOS "C".

TABLE 5-3: PEAK HOUR QUEUING SUMMARY FOR OPENING YEAR (2029) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	Without Project 95th Percentile Queue (Feet) AM Peak	Without Project 95th Percentile Queue (Feet) PM Peak	Without Project Acceptable? [1] AM	Without Project Acceptable? [1] PM	With Project 95th Percentile Queue (Feet) AM Peak	With Project 95th Percentile Queue (Feet) PM Peak	With Project Acceptable? [1] AM	With Project Acceptable? [1] PM
1	Imperial Hwy. & SR-91 WB Ramps	WBL	1,280	400	257	Yes	Yes	400	257	Yes	Yes
		WBR	495	500 [3]	340	Yes	Yes	500 [3]	340	Yes	Yes
2	Imperial Hwy. & SR-91 EB Ramps	EBL	2,365	370	337	Yes	Yes	375	341	Yes	Yes
		EBR	510	459	400	Yes	Yes	457	407	Yes	Yes
13	Weir Canyon Rd. & SR-91 WB Ramps	WBL	1,580	227	353	Yes	Yes	230	356	Yes	Yes
		WBR	350	273	416 [3]	Yes	Yes	274	427	Yes	Yes
14	Weir Canyon Rd. & SR-91 EB Ramps	EBL	1,740	346	170	Yes	Yes	347	172	Yes	Yes
		EBR	225	401 [3]	231 [3]	Yes	Yes	405 [3]	239 [3]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-91 mainline.

5.8 DEFICIENCIES AND IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient under Opening Year (2029) With Project traffic conditions in an effort to achieve an acceptable LOS.

5.8.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

As previously shown in Table 5-1, all study area intersections are anticipated to continue to operate at an acceptable LOS during the AM and PM peak hours under Opening Year (2029) With Project traffic conditions. As such, no improvements, aside from those that are needed to facilitate site access, have been identified.

5.8.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT ROADWAY SEGMENTS

As shown in Table 5-2, Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road, is anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under General Plan Buildout With Project traffic conditions. The high volume of through vehicles is attributable to vehicles bypassing the SR-91 Freeway during peak commute hours throughout the day. Introducing additional lanes along Santa Ana Canyon Road would encourage more vehicles to utilize this roadway segment and would be counterintuitive to the State's goals with regards to Vehicle Miles Traveled. Roadway widening is also infeasible due to right-of-way limitations and is inconsistent with the City's General Plan.

The City of Anaheim lacks specific criteria to determine a significant project impact on roadway segments. However, based on criteria similar to the City's intersection deficiency criteria, the Project-related increase in V/C is deemed not significant. The Project is anticipated to increase the V/C by 0.012 (1.2%), which is less than the threshold of 0.030 (3.0%) identified for intersections anticipated to operate at LOS D under pre-Project conditions. Additionally, the intersections on both ends of the roadway segment are anticipated to operate at an acceptable LOS (LOS D or better) suggesting that the additional capacity accommodated through turn lanes at the choke-points of the roadway segments (e.g., intersections) can sufficiently handle the anticipated future traffic.

At the City's request, additional peak hour roadway segment analysis was conducted for the deficient roadway segments to determine whether or not there is a project impact at the respective roadway segment. The peak hour roadway segment analysis utilizes an adjusted segment capacity for each direction of the applicable roadway segment by multiplying the mid-block number of lanes in the applicable direction by a lane capacity of 1,900 vehicles per hour, then multiplied by the AM and PM peak hour V/C ratios percentage of green time at the controlling signalized intersections. This methodology is utilized to determine if congestion on a street segment is due to a lack of capacity or if traffic flows are affected by traffic signal coordination. Table 5-4 provides a summary of the Opening Year (2029) Without Project and With Project traffic conditions peak hour roadway segment capacity analysis.

TABLE 5-4: PEAK HOUR ROADWAY SEGMENT ANALYSIS FOR OPENING YEAR (2029) CONDITIONS

Without Project:

#	Roadway	Segment Limits	Peak Hour	Direction	Lanes	LOS Capacity[1]	Without Project 2029	V/C[2]	LOS[3]	Acceptable LOS[4]
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	EB	2	1,403	1,073	0.765	C	C
			AM	WB	2	2,301	1,837	0.798	C	C
			PM	EB	2	2,166	**1,753**	**0.809**	**D**	C
			PM	WB	2	1,231	**1,122**	**0.911**	**E**	C

With Project:

#	Roadway	Segment Limits	Peak Hour	Direction	Lanes	LOS Capacity[1]	With Project 2029	V/C[2]	LOS[3]	Acceptable LOS[4]
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	EB	2	1,438	1,085	0.755	C	C
			AM	WB	2	2,323	**1,871**	**0.805**	**D**	C
			PM	EB	2	2,190	**1,783**	**0.814**	**D**	C
			PM	WB	2	1,265	**1,141**	**0.902**	**E**	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] The adjusted LOS capacity is calculated based on City of Anaheim methodology for Peak Hour Roadway Segment analyses.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

[4] The City of Anaheim roadway standard is LOS "C".

			Peak Hour	Direction	Project-Related Increase in v/c	Threshold	Significant?
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	WB	0.007	0.030	No
			PM	EB	0.005	0.030	No
			PM	WB	-0.010	0.010	No

As shown in Table 5-4, Santa Ana Canyon Road between Imperial Highway and Anaheim Hills Road is anticipated to operate at an unacceptable LOS in the following directions and peak hours, based on the peak hour roadway capacity thresholds and minimum LOS criteria, under Opening Year (2029) With Project conditions:

- Westbound during the AM peak hour
- Eastbound during the PM peak hour
- Westbound during the PM peak hour

As shown in Table 5-4, the Project is anticipated to continue to increase the V/C by less than the applicable threshold identified for intersections. As such, based on criteria similar to the City's intersection deficiency criteria, the Project-related increase in V/C is deemed not significant.

5.8.3 IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUING DEFICIENCIES

There are no movements anticipated to experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year (2029) With Project traffic conditions. As such, no improvements have been identified.

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6 GENERAL PLAN BUILDOUT TRAFFIC CONDITIONS

This section discusses the methods used to develop General Plan Buildout traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for General Plan Buildout conditions are consistent with those shown previously at Exhibit 3-1, with the exception of the following:

- Deer Canyon Road is assumed to be constructed to provide site access by the Hills Preserve Project. The intersection of Deer Canyon Road and Santa Ana Canyon Road (#6) is assumed to be a signalized intersection.
- Other parallel facilities, that although not evaluated for the purposes of this analysis, are anticipated to be in place for General Plan Buildout traffic conditions and would affect the travel patterns within the study area.
- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for General Plan Buildout With Project conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).

6.2 GENERAL PLAN BUILDOUT WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the ATAM (see Section 4.8 *General Plan Buildout Volume Development* of this TA for additional discussion on the development of the long-range traffic forecasts). The weekday ADT and weekday peak hour volumes which can be expected for General Plan Buildout Without Project traffic conditions are shown at Exhibit 6-1.

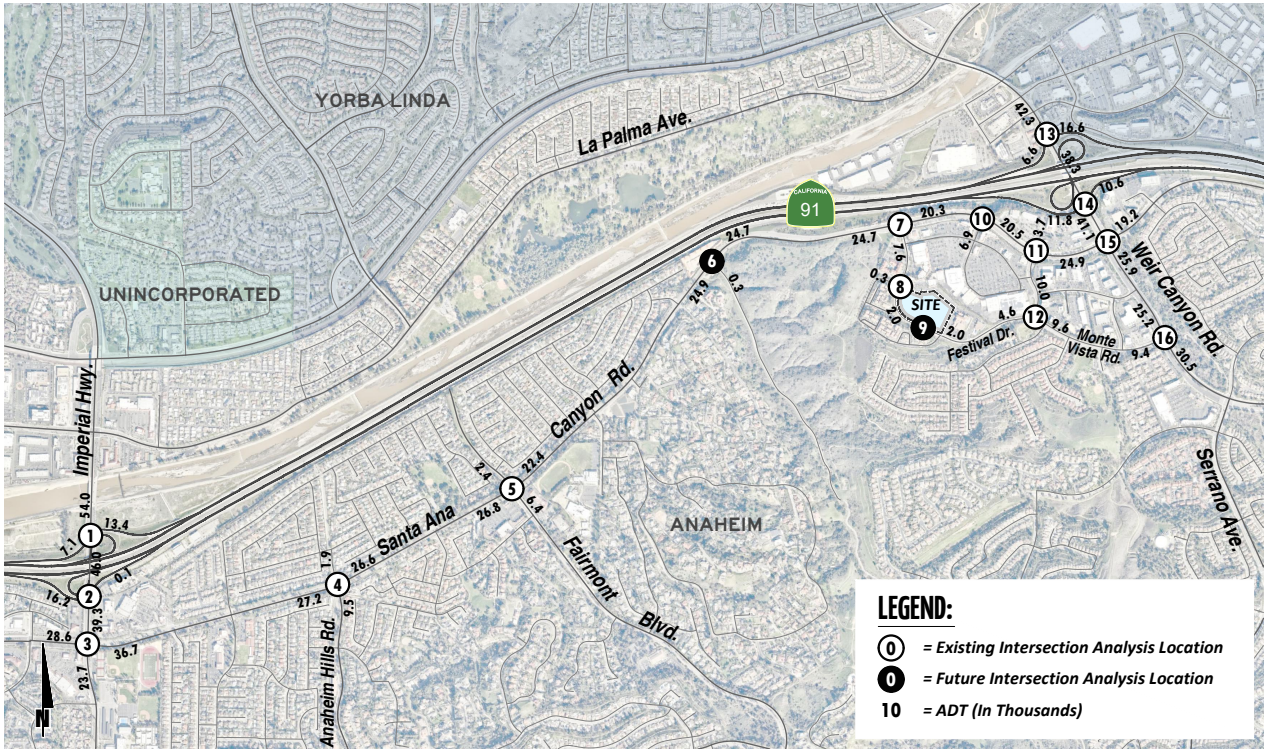
6.3 GENERAL PLAN BUILDOUT WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the ATAM plus traffic generated by the proposed Project. The weekday ADT and weekday peak hour volumes which can be expected for General Plan Buildout With Project traffic conditions are shown at Exhibit 6-2.

6.4 INTERSECTION OPERATIONS ANALYSIS

General Plan Buildout peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 Methodologies of this TA. The intersection analysis results are summarized in Table 6-1 for General Plan Buildout traffic conditions, which indicates that the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under General Plan Buildout Without Project and With Project traffic conditions. The intersection operations analysis worksheets for General Plan Buildout Without Project and With Project traffic conditions are included in Appendices 6.1 and 6.2, respectively.

EXHIBIT 6-1 : GENERAL PLAN BUILDOUT WITHOUT PROJECT TRAFFIC VOLUMES



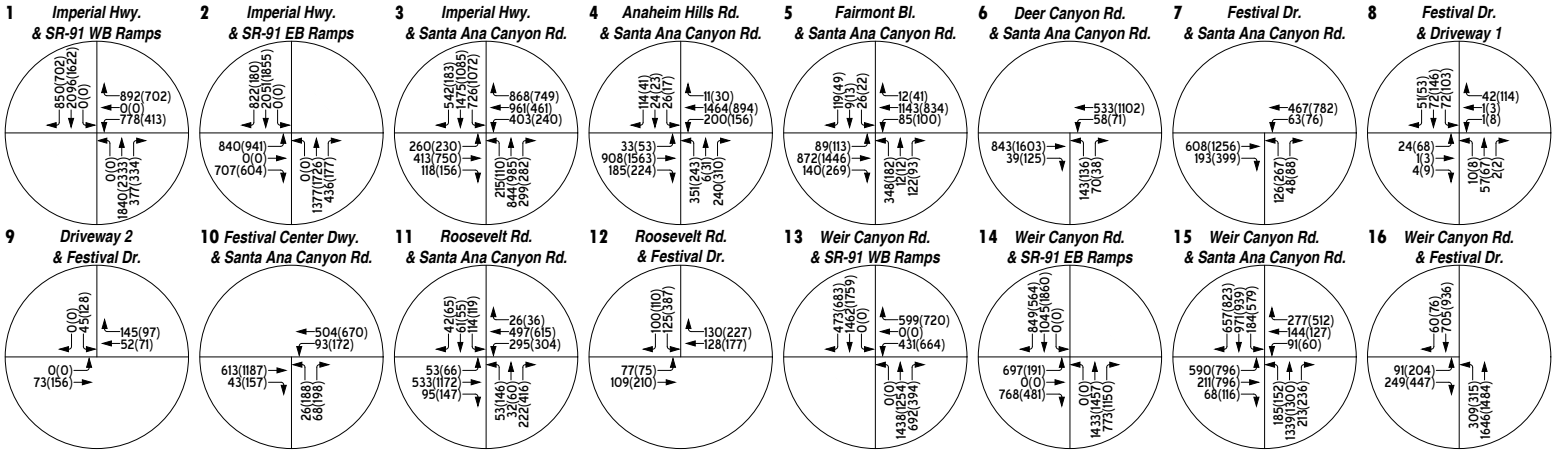
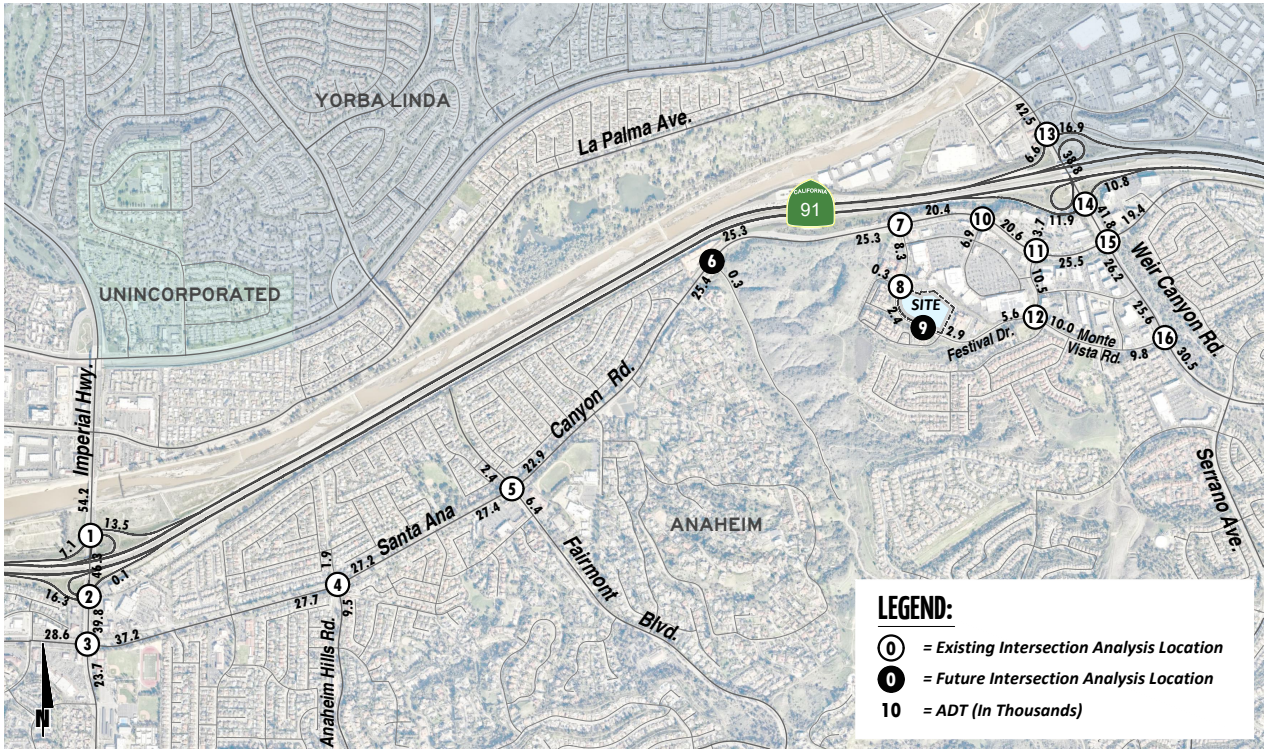


EXHIBIT 6-2 : GENERAL PLAN BUILDOUT WITH PROJECT TRAFFIC VOLUMES



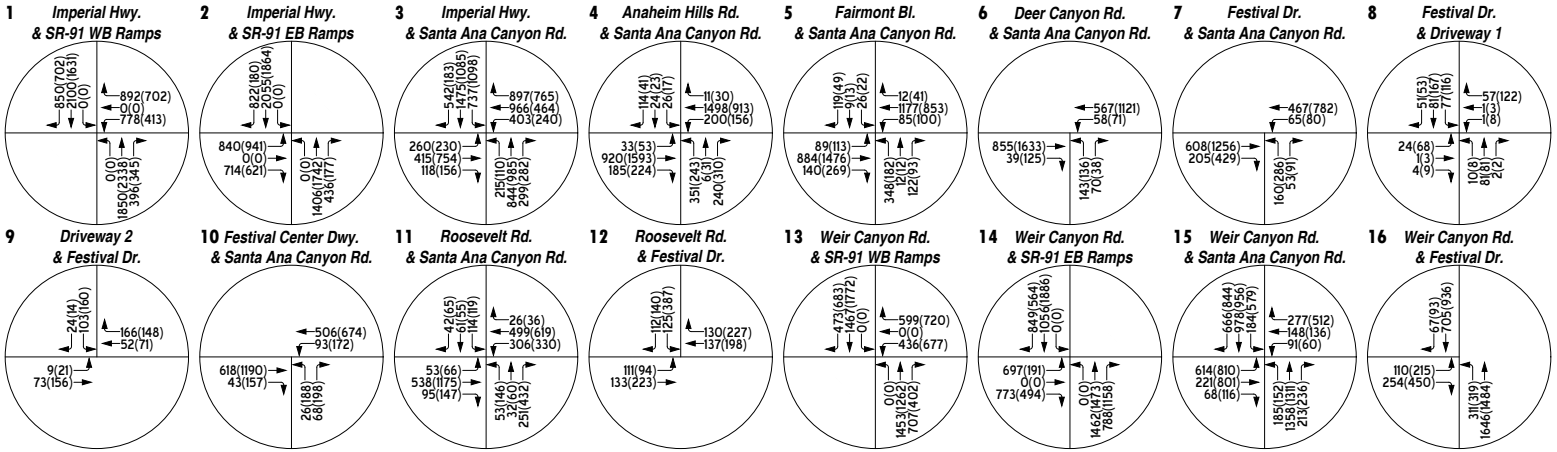


TABLE 6-1: INTERSECTION ANALYSIS FOR GENERAL PLAN BUILDOUT CONDITIONS

#	Intersection	Traffic Control [3]	Evaluation Methodology	General Plan Buildout Without Project Delay[1] (secs.) ICU (v/c)[2] AM	PM	Level of Service AM	PM	General Plan Buildout With Project Delay[1] (secs.) ICU (v/c)[2] AM	PM	Level of Service AM	PM	Project-Related Increase in V/C AM	PM
1	Imperial Hwy. & SR-91 WB Ramps	TS	HCM	19.3	11.7	B	B	19.3	11.8	B	B	--	--
			ICU	0.788	0.612	C	B	0.789	0.612	C	B	0.001	0.000
2	Imperial Hwy. & SR-91 EB Ramps	TS	HCM	17.0	14.2	B	B	17.1	14.4	B	B	--	--
			ICU	0.655	0.626	B	B	0.657	0.630	B	B	0.002	0.004
3	Imperial Hwy. & Santa Ana Canyon Rd.	TS	ICU	0.753	0.831	C	D	0.757	0.840	C	D	0.004	0.009
4	Anaheim Hills Rd. & Santa Ana Canyon Rd.	TS	ICU	0.708	0.808	C	D	0.718	0.817	C	D	0.004	0.009
5	Fairmont Bl. & Santa Ana Canyon Rd.	TS	ICU	0.616	0.625	B	B	0.626	0.634	B	B	0.010	0.009
6	Deer Canyon Rd. & Santa Ana Canyon Rd.	TS	ICU	0.416	0.643	A	B	0.420	0.652	A	B	0.004	0.009
7	Festival Dr. & Santa Ana Canyon Rd.	TS	ICU	0.243	0.420	A	A	0.255	0.427	A	A	0.012	0.007
8	Festival Dr. & Driveway 1	CSS	HCM	10.7	12.9	B	B	11.0	13.6	B	B	--	--
9	Driveway 2 & Festival Dr.	CSS	HCM	Future Intersection				10.3	11.6	B	B	--	--
10	Festival Center Dwy. & Santa Ana Canyon Rd.	TS	ICU	0.238	0.450	A	A	0.239	0.450	A	A	0.001	0.000
11	Roosevelt Rd. & Santa Ana Canyon Rd.	TS	ICU	0.376	0.598	A	A	0.394	0.609	A	B	0.018	0.011
12	Roosevelt Rd. & Festival Dr./Monte Vista Rd.	TS	ICU	0.229	0.312	A	A	0.262	0.336	A	A	0.033	0.024
13	Weir Canyon Rd. & SR-91 WB Ramps	TS	HCM	10.0	13.1	A	B	10.1	13.4	B	B	--	--
			ICU	0.539	0.666	A	B	0.541	0.671	A	B	0.002	0.005
14	Weir Canyon Rd. & SR-91 EB Ramps	TS	HCM	13.4	7.6	B	A	13.7	7.8	B	A	--	--
			ICU	0.618	0.556	B	A	0.624	0.565	B	A	0.006	0.009
15	Weir Canyon Rd. & Santa Ana Canyon Rd.	TS	ICU	0.622	0.860	B	D	0.632	0.866	B	D	0.010	0.006
16	Weir Canyon Rd. & Monte Vista Rd.	TS	ICU	0.443	0.550	A	A	0.446	0.548	A	A	0.003	-0.002

[1] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

[2] All signalized intersections are evaluated utilizing Intersection Capacity Utilization (ICU) methodology, reported as a volume-to-capacity ratio. For intersections with all way or cross street stop control, the HCM delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Signalized intersections within Caltrans jurisdiction will be evalutaed utilizing both HCM and ICU methodology.

[3] TS = Traffic Signal; CSS = Cross-street Stop; TS = Improvement

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for General Plan Buildout Without Project and With Project traffic conditions is based on the peak hour volumes or planning level ADT volume-based traffic signal warrants. There are no unsignalized study area intersections anticipated to meet a traffic signal warrant under both General Plan Buildout Without Project and With Project traffic conditions (see Appendices 6.3 and 6.4, respectively).

6.6 ROADWAY SEGMENT ANALYSIS

The roadway capacities utilized for the study area roadway segment analysis are obtained from the OCTA Guidance of Administration of the Orange County MPAH and the County of Orange TIM. These roadway segment capacities are approximate figures only and are used to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 6-2 provides a summary of the General Plan Buildout Without Project and With Project traffic conditions roadway segment capacity analysis. As shown in Table 6-2, the following study area roadway segments are anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under both General Plan Buildout Without Project and With Project traffic conditions:

- Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road (#1) – LOS D
- Santa Ana Canyon Road, from Anaheim Hills Road to Fairmont Boulevard (#2) – LOS D

TABLE 6-2: ROADWAY SEGMENT ANALYSIS FOR GENERAL PLAN BUILDOUT CONDITIONS

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Without Project			With Project			Acceptable LOS[4]
					GPBO	V/C[2]	LOS[3]	GPBO	V/C[2]	LOS[3]	
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	5D	46,875	**40,756**	**0.869**	**D**	**41,326**	**0.882**	**D**	C
2		Anaheim Hills Rd. to Fairmont Bl.	4D	37,500	**30,440**	**0.812**	**D**	**31,008**	**0.827**	**D**	C
3		Fairmont Bl. to Deer Canyon Rd.	4D	37,500	28,000	0.747	C	28,568	0.762	C	C
4		Deer Canyon Rd. Festival Dr.	4D	37,500	28,000	0.747	C	28,568	0.762	C	C
5		Festival Dr. to Roosevelt Rd.	6D	56,250	22,600	0.402	A	22,682	0.403	A	C
6		Roosevelt Rd. to Weir Canyon Rd.	6D	56,250	26,757	0.785	C	27,325	0.801	C	C
7	Roosevelt Rd.	Santa Ana Canyon Rd. to Festival Dr.	4D	25,000	11,400	0.334	A	11,888	0.349	A	C
8	Festival Dr.	Santa Ana Canyon Rd. to Driveway 1	2D	22,000	8,500	0.249	A	9,150	0.268	A	C
9		Driveway 2 to Roosevelt Rd.	2D	22,000	8,500	0.386	A	9,474	0.431	A	C
10	Monte Vista Rd.	Roosevelt Rd. to Weir Canyon Rd.	4D	25,000	11,100	0.444	A	11,506	0.460	A	C
11	Weir Canyon Rd.	SR-91 Freeway to Santa Ana Canyon Rd.	6D	56,250	44,155	0.785	C	44,887	0.798	C	C
12		Santa Ana Canyon Rd. to Monte Vista Rd.	6D	56,250	26,740	0.475	A	27,064	0.481	A	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] The volumes shown are based on LOS "E" roadway capacity as defined by the County of Orange Growth Management Plan.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

[4] The City of Anaheim roadway standard is LOS "C".

6.7 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for General Plan Buildout Without Project and With Project are presented in Table 6-3. As shown in Table 6-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under both the General Plan Buildout Without Project and With Project traffic conditions. Worksheets for General Plan Buildout Without Project and With Project traffic conditions queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

TABLE 6-3: PEAK HOUR QUEUING SUMMARY FOR GENERAL PLAN BUILDOUT CONDITIONS

				Without Project				With Project			
			Available	95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
#	Intersection	Movement	Stacking Distance (Feet)	AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
1	Imperial Hwy. & SR-91 WB Ramps	WBL	1,280	457	302	Yes	Yes	457	302	Yes	Yes
		WBR	495	617 [2,3]	369	Yes	Yes	617 [2,3]	369	Yes	Yes
2	Imperial Hwy. & SR-91 EB Ramps	EBL	2,365	397	357	Yes	Yes	403	366	Yes	Yes
		EBR	510	496	434	Yes	Yes	493	436	Yes	Yes
13	Weir Canyon Rd. & SR-91 WB Ramps	WBL	1,580	258	384	Yes	Yes	262	391	Yes	Yes
		WBR	350	309	461 [3]	Yes	Yes	312	461 [3]	Yes	Yes
14	Weir Canyon Rd. & SR-91 EB Ramps	EBL	1,740	379	184	Yes	Yes	380	187	Yes	Yes
		EBR	225	442 [3]	260 [3]	Yes	Yes	447 [3]	267 [3]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

6.8 DEFICIENCIES AND IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient under General Plan Buildout With Project traffic conditions in an effort to achieve an acceptable LOS.

6.8.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

As previously shown in Table 6-1, all study area intersections are anticipated to continue to operate at an acceptable LOS during the AM and PM peak hours under General Plan Buildout With Project traffic conditions. As such, no improvements, aside from those that are needed to facilitate site access, have been identified.

6.8.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT ROADWAY SEGMENTS

As shown in Table 6-2, Santa Ana Canyon Road, from Imperial Highway to Anaheim Hills Road and from Anaheim Hills Road to Fairmont Boulevard, is anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under General Plan Buildout With Project traffic conditions. The high volume of through vehicles is attributable to vehicles bypassing the SR-91 Freeway during peak commute hours throughout the day. Introducing additional lanes along Santa Ana Canyon Road would encourage more vehicles to utilize this roadway segment and would be counterintuitive to the State's goals with regards to Vehicle Miles Traveled. Roadway widening is also infeasible due to right-of-way limitations and is inconsistent with the City's General Plan.

The City of Anaheim lacks specific criteria to determine a significant project impact on roadway segments. However, based on criteria similar to the City's intersection deficiency criteria, the Project-related increase in V/C is deemed not significant. The Project is anticipated to increase the V/C by less than 0.01 (1.0%) at each deficient segment, which is less than the threshold of 0.030 (3.0%) identified for intersections anticipated to operate at LOS D under pre-Project conditions. Additionally, the intersections on both ends of the roadway segments are anticipated to operate at an acceptable LOS (LOS D or better) suggesting that the additional capacity accommodated through turn lanes at the choke-points of the roadway segments (e.g., intersections) can sufficiently handle the anticipated future traffic.

At the City's request, additional peak hour roadway segment analysis was conducted for the deficient roadway segments to determine whether or not there is a project impact at the respective roadway segment. The peak hour roadway segment analysis utilizes an adjusted segment capacity for each direction of the applicable roadway segment by multiplying the mid-block number of lanes in the applicable direction by a lane capacity of 1,900 vehicles per hour, then multiplied by the AM and PM peak hour V/C ratios percentage of green time at the controlling signalized intersections. This methodology is utilized to determine if congestion on a street segment is due to a lack of capacity or if traffic flows are affected by traffic signal coordination. Table 6-4 provides a summary of the General Plan Buildout Without Project and With Project traffic conditions peak hour roadway segment capacity analysis.

As shown in Table 6-4, Santa Ana Canyon Road between Imperial Highway and Anaheim Hills Road is anticipated to operate at an unacceptable LOS in the following directions and peak hours, based on the peak hour roadway capacity thresholds and minimum LOS criteria, under General Plan Buildout With Project conditions:

- Westbound during the AM peak hour
- Eastbound during the PM peak hour
- Westbound during the PM peak hour

As shown in Table 6-4, the Project is anticipated to continue to increase the V/C by less than the applicable threshold identified for intersections. As such, based on criteria similar to the City's intersection deficiency criteria, the Project-related increase in V/C is deemed not significant.

TABLE 6-4: PEAK HOUR ROADWAY SEGMENT ANALYSIS FOR GENERAL PLAN BUILDOUT CONDITIONS

Without Project:

#	Roadway	Segment Limits	Peak Hour	Direction	Lanes	LOS Capacity[1]	Without Project GPBO	Without Project V/C[2]	Without Project LOS[3]	Acceptable LOS[4]
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	EB	2	1,449	1,127	0.778	C	C
			AM	WB	2	2,308	**1,929**	**0.836**	**D**	C
			PM	EB	2	2,163	**1,840**	**0.851**	**D**	C
			PM	WB	2	1,223	**1,178**	**0.963**	**E**	C
2	Santa Ana Canyon Rd.	Anaheim Hills Rd. to Fairmont Bl.	AM	EB	2	1,604	1,101	0.687	B	C
			AM	WB	2	2,097	1,610	0.767	C	C
			PM	EB	2	2,614	1,828	0.699	B	C
			PM	WB	2	1,520	1,065	0.700	B	C

With Project:

#	Roadway	Segment Limits	Peak Hour	Direction	Lanes	LOS Capacity[1]	With Project GPBO	With Project V/C[2]	With Project LOS[3]	Acceptable LOS[4]
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	EB	2	1,429	1,139	0.797	C	C
			AM	WB	2	2,329	**1,963**	**0.843**	**D**	C
			PM	EB	2	2,186	**1,870**	**0.856**	**D**	C
			PM	WB	2	1,256	**1,197**	**0.953**	**E**	C
2	Santa Ana Canyon Rd.	Anaheim Hills Rd. to Fairmont Bl.	AM	EB	2	1,578	1,113	0.705	B	C
			AM	WB	2	2,329	1,709	0.734	C	C
			PM	EB	2	2,577	1,858	0.721	C	C
			PM	WB	2	1,498	1,084	0.723	C	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] The volumes shown are based on the lane capacities per the City of Anaheim's guidelines.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

[4] The City of Anaheim roadway standard is LOS "C".

			Peak Hour	Direction	Project-Related Increase in v/c	Threshold	Significant?
1	Santa Ana Canyon Rd.	Imperial Hwy. to Anaheim Hills Rd.	AM	WB	0.007	0.030	No
			PM	EB	0.005	0.030	No
			PM	WB	-0.010	0.010	No

6.8.3 IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUING DEFICIENCIES

There are no movements anticipated to experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under General Plan Buildout With Project traffic conditions. As such, no improvements have been identified.

7 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Anaheim are funded through a combination of construction of improvements, development impact fee programs or fair share contributions, such as the City of Anaheim Transportation Impact and Improvement Fee (TIIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

7.1 CITY OF ANAHEIM TRANSPORTATION IMPACT AND IMPROVEMENT FEE PROGRAM

The Project will be subject to City of Anaheim's TIIF program which includes a component for streets, traffic signals, and bridges. This program aims to mitigate the additional traffic burdens created by new development to the City's arterial and collector street system. A transportation fee will be imposed on all new development in the City to finance the costs of street improvements, including widening and reconstruction, new traffic signals, street landscaping, intersection improvements, and freeway interchange improvements.

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8 REFERENCES

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