URBAN | CROSSROADS

4665 LAMPSON AVENUE

TRAFFIC ANALYSIS

PREPARED BY: Charlene So, PE | cso@urbanxroads.com
Aric Evatt | aevatt@urbanxroads.com

Reference Number	Agency	Date
14501-07 TA Report	City of Los Alamitos	June 1, 2023

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
OCTA	Orange County Transportation Authority
OCTAM	Orange County Transportation Analysis Model
PHF	Peak Hour Factor
Project	4665 Lampson Avenue
TA	Traffic Analysis
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 4665 Lampson Avenue ("Project"), which is located in the City of Los Alamitos but adjacent to the City of Seal Beach, as shown on 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. Although the proposed Project is located in the City of Los Alamitos, access to the site via Lampson Avenue lies within the City of Seal Beach's jurisdiction. This traffic study has been prepared in accordance with the City of Los Alamitos' requirements and the City of Seal Beach's Transportation Analysis Guidelines (June 2020, referred to as City Guidelines) as the study area intersections lie within the City of Seal Beach. (1) The Project traffic study scoping agreement is provided in Appendix 1.1 of this TA, which has been reviewed and approved by the City of Los Alamitos and City of Seal Beach.

1.1 SUMMARY OF FINDINGS

The Project is to construct the following improvements as design features in conjunction with development of the site:

- Project to implement stop controls for the southbound approach at all driveways on Lampson Avenue. Driveway 1 is proposed to be restricted to right-in/right-out access only and a median will need to be constructed to restrict the access. Access to Driveway 2 will allow for full access. If and when Driveway 2 meets the appropriate warrants, a traffic signal should be installed at this location and should be coordinated along with the other traffic signals along Lampson Avenue.
- The Project frontage roadway of Lampson Avenue is currently constructed to its ultimate General Plan roadway classification. As such, frontage improvements will be limited to sidewalks, driveway modifications needed to accommodate site access, and landscaping improvements as required by City standards. The design of Lampson Avenue should meet the City of Seal Beach's criteria.

Additional details and intersection lane geometrics are provided in Section 1.6 Recommendations of this report.

1.2 PROJECT OVERVIEW

The Project consists of the development of 55 single family detached residential dwelling units (cluster homes), 114 multifamily (low-rise) residential dwelling units, and 77 affordable apartment dwelling units (total of 246 dwelling units). A preliminary site plan for the proposed Project is shown on Exhibit 1-2. Access to the Project site will be accommodated to Lampson Avenue via two proposed driveways. The site is currently occupied by the California Department of Fish and Wildlife building and parking lot; however, no credit has been taken for the existing use for the purposes of this traffic study in an effort to conduct a conservative analysis. The Project is anticipated to have an Opening Year of 2026.

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). (2) The Project is anticipated to generate an increase of 1,658 two-way trip-ends per day with 112 AM peak hour trips and 147 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 1-1: LOCATION MAP

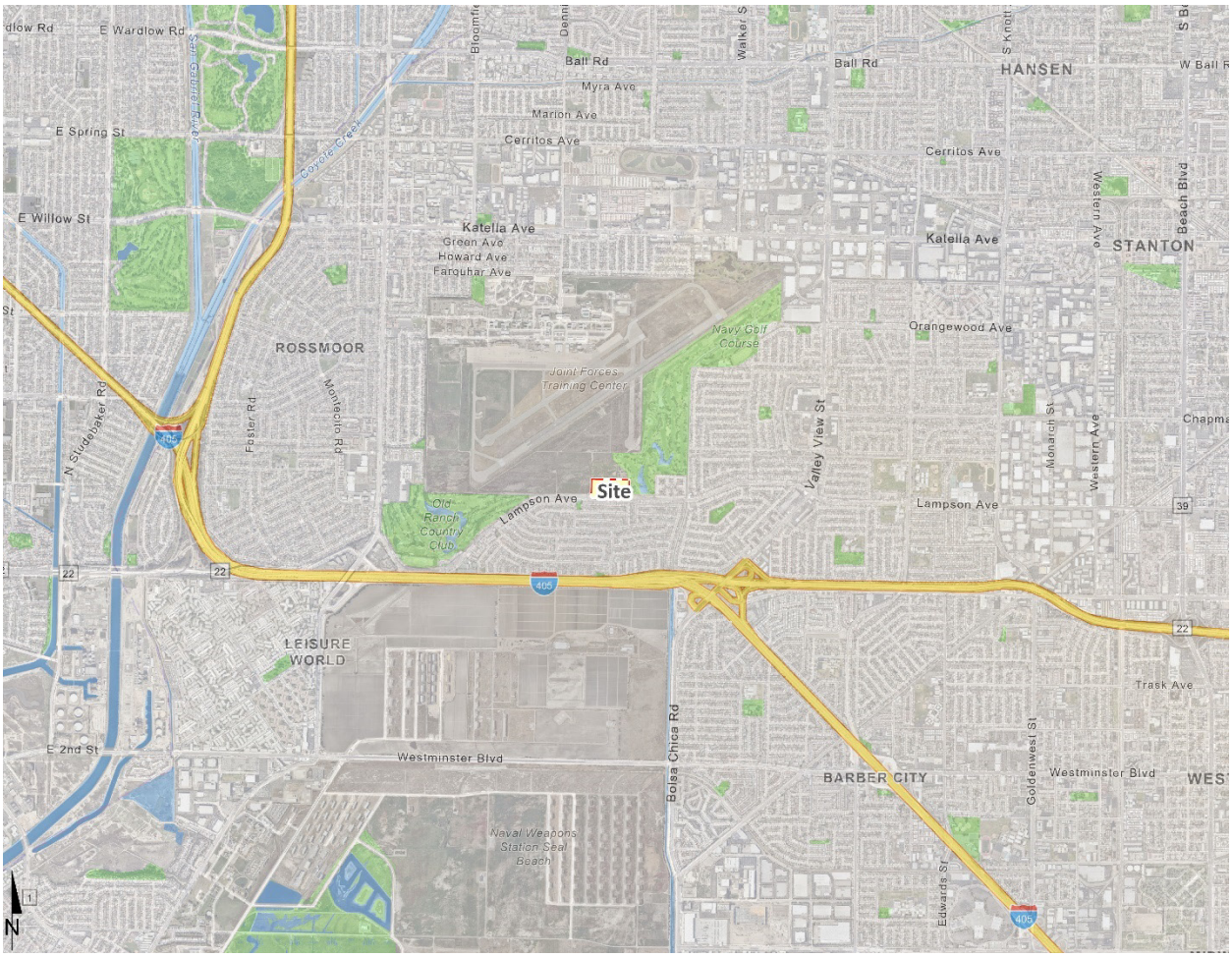


EXHIBIT 1-2: PRELIMINARY SITE PLAN

1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential deficiencies to traffic and circulation have been assessed for each of the following conditions:

- Existing (2022) Conditions
- Opening Year Cumulative (2026) Without Project
- Opening Year Cumulative (2026) With Buildout
- General Plan Buildout (2045) Without Project
- General Plan Buildout (2045) With Project

The General Plan Buildout volumes have been developed using the Orange County Transportation Analysis Model (OCTAM).

1.3.1 EXISTING (2022) CONDITIONS

Information for Existing (2022) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 OPENING YEAR CUMULATIVE (2026) CONDITIONS

The Opening Year Cumulative (2026) traffic conditions analyses determine the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed by other known cumulative projects or the Project. To account for background traffic growth, an ambient growth factor from Existing (2022) conditions of 8.24% (2 percent per year, compounded over 4 years) is included for Opening Year Cumulative (2026) traffic conditions.

Conservatively, this TA estimates the area ambient traffic growth and then adds traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed ambient growth rates; and some of these related projects may not be implemented and operational within the 2026 Opening Year timeframe assumed for the Project. The resulting traffic growth utilized in the TA (ambient growth factor plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under 2026 conditions.

1.3.3 GENERAL PLAN BUILDOUT CONDITIONS

The General Plan Buildout traffic conditions analyses determine the potential long-range cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed by other known cumulative projects or the Project. Traffic forecasts for General Plan Buildout traffic conditions for the intersections of Seal Beach Boulevard at Lampson Avenue and Valley View Street at Lampson Avenue have been developed using OCTAM. However, all other remaining study area intersections are not reflected in the traffic model. As such, the traffic volumes at all remaining study intersections have been forecasted by applying an ambient growth factor from Existing (2022) conditions of 14% in conjunction with the traffic generated by other known or probable related projects. This growth is based on the growth observed between Existing and General Plan Buildout conditions for the two intersections that are included in the OCTAM model.

The General Plan Buildout conditions analysis will be utilized to determine if improvements needed to accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Los Alamitos (lead agency) and City of Seal Beach General Plans. (3) (4)

1.4 STUDY AREA

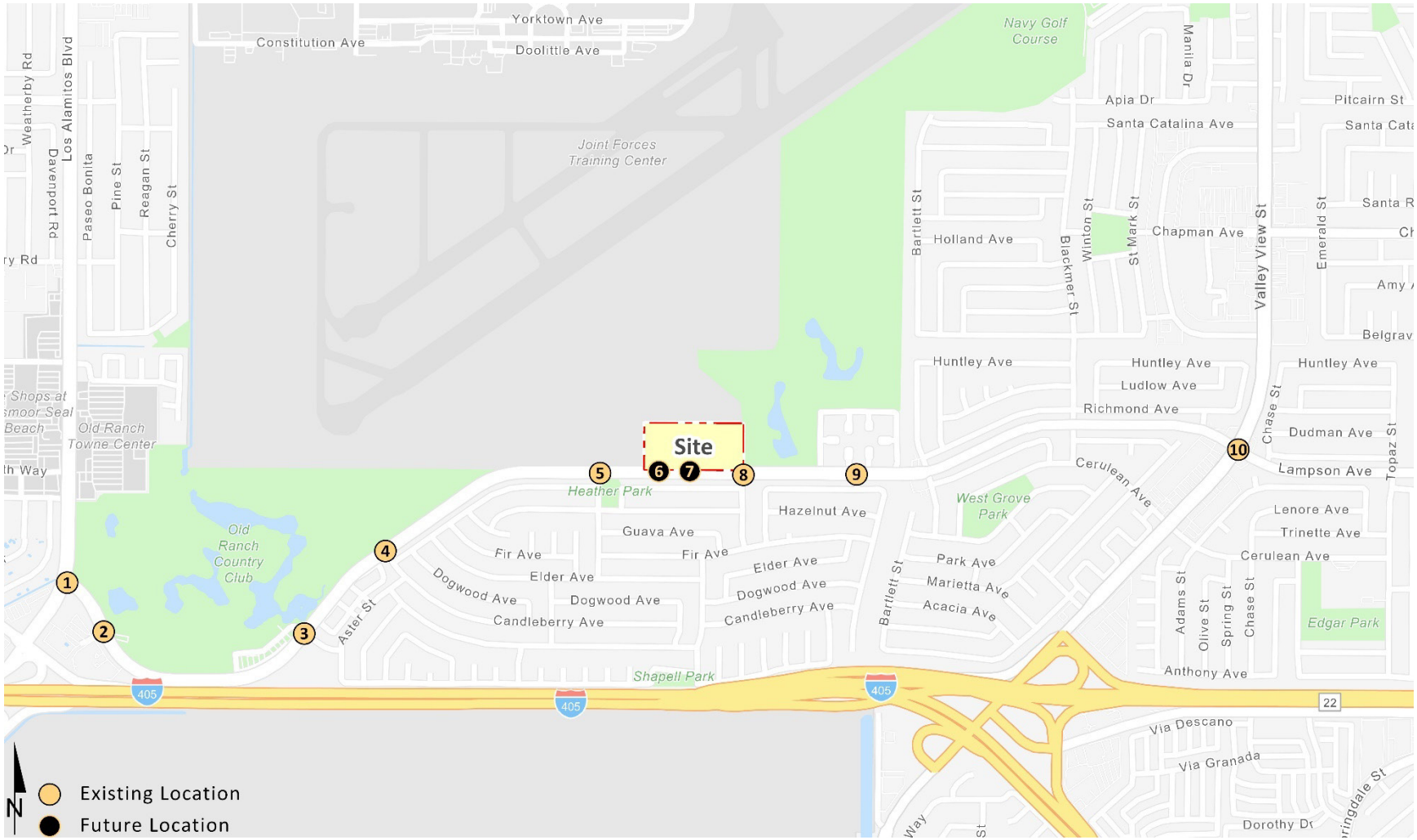
To ensure that this TA satisfies the City of Los Alamitos and City of Seal Beach's traffic study requirements, Urban Crossroads, Inc. prepared a Project traffic study scoping package for review by both agencies prior to the preparation of this report. This agreement provides an outline of the Project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

The 10 study area intersections shown on Exhibit 1-3 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with both agencies during the scoping process. The intent of a Congestion Management Program (CMP) is to more 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. The Orange County CMP became effective with the passage of Proposition 111 in 1990 and most recently updated in 2021. The Orange County Transportation Authority (OCTA) adopted the 2021 CMP for the County of Orange in November 2021. (5) There are no CMP intersections within the study area.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP?
1	Seal Beach Bl. & Lampson Av.	Seal Beach	No
2	Old Ranch Plaza & Lampson Av.	Seal Beach	No
3	Basswood St. & Lampson Av.	Seal Beach	No
4	Candleberry Av. & Lampson Av.	Seal Beach	No
5	Heather St. & Lampson Av.	Seal Beach/Los Alamitos	No
6	Driveway 1 & Lampson Av.	Seal Beach/Los Alamitos	No
7	Driveway 2 & Lampson Av.	Seal Beach/Los Alamitos	No
8	Rose St. & Lampson Av.	Seal Beach/Los Alamitos	No
9	Tulip St. & Lampson Av.	Seal Beach/Los Alamitos	No
10	Valley View St. & Lampson Av.	Garden Grove	No

EXHIBIT 1-3: STUDY AREA



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 Cumulative (2026) Traffic Conditions, and Section 6 General Plan Buildout Traffic Conditions includes the detailed analyses. A summary of LOS results for all analysis scenarios are presented in Table 1-2.

1.5.1 EXISTING (2022) CONDITIONS

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

1.5.2 OPENING YEAR CUMULATIVE (2026) CONDITIONS

The following study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under Opening Year Cumulative (2026) Without Project traffic conditions (see Table 1-2):

- Seal Beach Bl. & Lampson Av. (#1) – LOS E AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for Opening Year Cumulative (2026) Without Project traffic conditions. However, the addition of Project traffic is anticipated to increase the volume-to-capacity (v/c) ratio by more than 0.01 at the intersection of Seal Beach Boulevard and Lampson Avenue.

Although the intersection of Valley View Street at Lampson Avenue is anticipated to operate at a deficient LOS based on the Intersection Capacity Utilization (ICU) methodology, a more detailed peak hour intersection operations assessment based on the Highway Capacity Manual (HCM) methodology indicates acceptable peak hour operations. As such, no intersection improvements have been recommended at the intersection of Valley View Street and Lampson Avenue.

1.5.3 GENERAL PLAN BUILDOUT CONDITIONS

The following study area intersection is anticipated to continue to operate at an unacceptable LOS during the peak hours under General Plan Buildout Without Project traffic conditions (see Table 1-2):

- Seal Beach Bl. & Lampson Av. (#1) – LOS F AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for General Plan Buildout Without Project traffic conditions. Similar to Opening Year Cumulative traffic conditions, the addition of Project traffic is anticipated to increase the v/c ratio by more than 0.01 at the intersection of Seal Beach Boulevard and Lampson Avenue under General Plan Buildout With Project traffic conditions.

Similar to Opening Year Cumulative (2026) traffic conditions, the intersection of Valley View Street at Lampson Avenue is anticipated to operate at a deficient LOS based on the ICU methodology, but would operate at acceptable LOS during the peak hour based on the HCM methodology. As such, no intersection improvements have been recommended at the intersection of Valley View Street and Lampson Avenue for General Plan Buildout traffic conditions.

TABLE 1-2: SUMMARY OF LOS

#	Intersection	Existing (2022)		2026 Without Project		2026 With Project		GPBO Without Project		GPBO With Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Seal Beach Bl. & Lampson Av.	A - D	A - D	E	E	E	E	F	F	F	F
2	Old Ranch Plaza & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
3	Basswood St. & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
4	Candleberry Av. & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
5	Heather St. & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
6	Driveway 1 & Lampson Av.	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
7	Driveway 2 & Lampson Av.	N/A	N/A	N/A	N/A	A - D	A - D	N/A	N/A	A - D	A - D
8	Rose St. & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
9	Tulip St. & Lampson Av.	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D
10	Valley View St. & Lampson Av.[1]	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D	A - D

A - D = A - D E = E F = F

[1] Based on HCM methodology.

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 driveway intersection recommendations are shown on Exhibit 1-4 and roadway improvements are summarized below.

Driveway 1 & Lampson Avenue (#6) – Project to implement a stop control for egress traffic at Driveway 1 on Lampson Avenue. The intersection is proposed to be restricted to right-in/right-out access only. The access at this driveway should be controlled by a raised median.

Driveway 2 & Lampson Avenue (#7) – Driveway 2 is not anticipated to meet a peak hour or planning level (daily volume) based traffic signal warrant under any of the analysis scenarios. However, the City Engineer should determine whether other applicable warrants would require the installation of a traffic signal at Driveway 2. If a traffic signal is installed, then it should be coordinated with other signals along Lampson Avenue to accommodate optimal vehicle progression. A minimum of 150-feet should be accommodated for the eastbound left turn into the Project.

The Project frontage roadway of Lampson Avenue is currently constructed to its ultimate General Plan roadway classification. As such, frontage improvements will be limited to sidewalk improvements, driveway modifications to accommodate site access, and landscaping improvements as required by City standards.

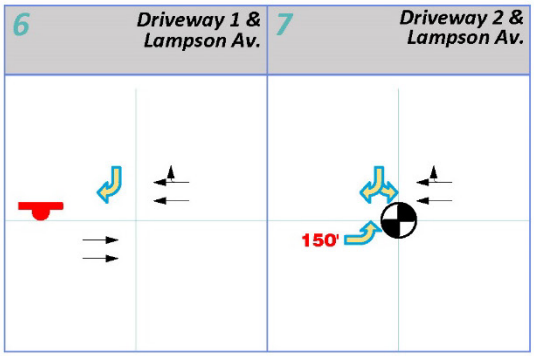
Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the City of Los Alamitos General Plan Circulation Element.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiency identified under Opening Year Cumulative (2026) and General Plan Buildout traffic conditions are shown in Table 1-3. The Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fair share that would be assigned to construction of the identified recommended improvements.

EXHIBIT 1-4: SITE ACCESS RECOMMENDATIONS



0 = Future Intersection Analysis Location
= New Traffic Signal
= Stop Sign
= Existing Lane
= Lane Improvement
150' = Recommended Turn Pocket Length

TABLE 1-3: SUMMARY OF INTERSECTION IMPROVEMENTS

#	Intersection Location	Jurisdiction	Analysis Scenarios		Improvements included in Fee Program?	Mechanism for Improvement[1]	Fair Share %[2]
			2026 With Project	GPBO With Project			
1	Seal Beach Bl. & Lampson Av.	Seal Beach	Restripe the number 2 WB left as a shared left-right turn lane	Same	No	Fair Share	6.1%

[1] Identifies the Project's responsibility to construct an improvement or contribute fair share or fee payment towards the implementation of the improvements shown. If identified as a Project construct obligation, then no fair share percentage has been identified.

[2] Program improvements constructed may be eligible for fee credit, at discretion of City. See Table 7-1 for Fair Share Calculations.

1.7 QUEUING ANALYSIS

A queuing analysis has been performed for the Project driveways on Lampson Avenue under General Plan Buildout With Project traffic conditions. The traffic modeling and signal timing optimization software package SimTraffic has been utilized to assess the queues. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. These random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each applicable turn lane. The SimTraffic simulation has been recorded 5 times, during the weekday AM and PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals. Queuing analysis worksheets for the weekday AM and PM peak hours are provided in Appendix 1.2 of this report for General Plan Buildout With Project traffic conditions.

As shown in Table 1-4, no site adjacent queues are anticipated under General Plan Buildout traffic conditions. An eastbound left turn lane with a minimum of 150-feet of storage at Driveway 2 is anticipated to sufficiently accommodate 95th percentile peak hour queues.

TABLE 1-4: PEAK HOUR QUEUING SUMMARY FOR GENERAL PLAN BUILDOUT 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
6	Driveway 1 & Lampson Av.	SBR	100	39	37	Yes	Yes
7	Driveway 2 & Lampson Av.	SBL/R	100	58	60	Yes	Yes
		EBL	150	23	42	Yes	Yes
		WBT	520	0	3	Yes	Yes

* SB = Southbound, EB = Eastbound, WB = Westbound, L = Left, T = Through, R = Right

[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.

1.8 PEDESTRIAN & BICYCLE FACILITIES

As noted previously, frontage improvements will include sidewalk improvements, driveway modifications to accommodate site access, and landscaping improvements as required by City standards. The proposed sidewalk along the Project's frontage on the north side of Lampson Avenue will provide connectivity with proposed sidewalks and paths internal to the Project. An accessible ramp will be accommodated at the northeast corner of the intersection of Rose Street and Lampson Avenue to provide connectivity to the existing sidewalk system on the south side of Lampson Avenue via the existing marked crosswalk. The Project should also maintain the existing Class II (on-street, striped) bike lanes along its frontage on Lampson Avenue.

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 City 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 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.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Los Alamitos requires signalized CMP intersections to be evaluated through ICU analysis which compares the peak hour traffic volumes to intersection capacity. Lane capacities of 1,600 vehicles per hour of green time (left turn and shared lanes) and 1,700 vehicles per hour of green time (through and right turn lanes) for the ICU calculations. 0.10 has been assumed representing 10 percent for the yellow clearance/lost time and inherent vehicle delay between cycles with an assumed signal cycle of 100 seconds. The ICU LOS definitions based on volume to capacity (v/c) ratio are presented in Table 2-1. The Traffix software package has been utilized to evaluate the signalized intersections using the ICU methodology with the analysis parameters discussed above.

TABLE 2-1 INTERSECTION CAPACITY UTILIZATION (ICU) LOS DEFINITIONS

Level of Service	Critical Volume to Capacity 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

Source: 2021 OCTA CMP, Figure 1 (Chapter 2)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Los Alamitos and City of Seal Beach require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (6) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). 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).

The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The 6th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (6) The HCM uses different procedures depending on the type of intersection control.

The traffic modeling and signal timing optimization software package Synchro (Version 11) has been utilized to analyze signalized intersections. Synchro is a microscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Equations are used to determine measures of effectiveness such as delay and queue length.

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. (6)

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, 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 intersection capacity exceeded.	> 50.00	F

Source: HCM, 6th 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 the California Department of Transportation (Caltrans) and other public agencies to quantitatively justify or ascertain 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), for all study area intersections. (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. Rural warrants have been utilized for intersections located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour and urban warrants have been utilized for those that operate at less than 40 miles per hour. 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.

Traffic signal warrant analyses were performed for the future unsignalized study area intersection of Driveway 2 at Lampson Avenue during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips. All existing study area intersections are currently signalized, so traffic signal warrant analysis has not been performed for Existing traffic conditions. Driveway 1 on Lampson Avenue is proposed to be restricted to right-in/right-out access only. As such, traffic signal warrant analysis has not been performed for Driveway 2 as the installation of a signal at this location is not suitable based on its access and location with respect to other existing and proposed signalized intersections. The traffic signal warrant analyses for future conditions are presented in Section 5 Opening Year Cumulative (2026) Traffic Conditions and Section 6 General Plan Buildout Traffic 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 LEVEL OF SERIVCE (LOS) CRITERIA

The City of Los Alamitos and City of Seal Beach have established LOS D as the minimum level of service for all roadways/intersections within the City. Therefore, any intersection operating at LOS E or F will be considered deficient for the purposes of this analysis.

2.5 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies.

2.5.1 CITY OF LOS ALAMITOS & CITY OF SEAL BEACH

To determine whether the addition of project traffic at a study intersection result in a deficiency, the following thresholds of significance will be utilized to determine when an intersection requires improvements:

Existing ICU	Project Related Increase in ICU
0.00 - 0.69	0.06
0.70 - 0.79	0.04
0.80 - 0.89	0.02
0.90+	0.01

2.5.2 CITY OF GARDEN GROVE

To determine whether the addition of project traffic at a study intersection result in a deficiency, the following thresholds of significance will be utilized:

- Any signalized study intersection operating at an acceptable LOS D or better without project in which the addition of project traffic causes the intersection to degrade to LOS E or F shall identify improvements to improve the operations to LOS D or better.
- Any signalized intersection that is operating at LOS E or F without project traffic where the project increases v/c by 0.010 or more shall identify improvements to offset the increase in delay.
- An operational improvement would be required if the study determines that either section a) or both sections b) and c) occur at unsignalized study intersections:

  a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or LOS F.

  AND

  b) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.

2.6 PROJECT FAIR SHARE CALCULATION METHODOLOGY

For improvements that do not appear in a pre-existing fee program, a fair share contribution based on the Project's proportional share may be imposed in order to address the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the City's Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval). The Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future traffic less existing baseline traffic:

Project Fair Share % = Project Traffic / (General Plan Buildout With Project Total Traffic – Existing (2022) Traffic)

The detailed Project fair share contribution calculations are presented in Section 7 Fair Share Calculations of this TA (see Table 7-1).

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Los Alamitos and City of Seal Beach General Plan Circulation Network, and a review of existing peak hour intersection operations analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement (Appendix 1.1), the study area includes a total of 10 existing and future intersections as shown previously on Exhibit 1-3. 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 CITY OF LOS ALAMITOS GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Los Alamitos. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways, as identified in the City of Los Alamitos General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Los Alamitos General Plan Circulation Element and below is a summary of the major study area roadways and their General Plan classifications:

- Smart Street (right-of-way is 122-146-feet, typically 6 to 8-lane divided roadways)
- Major Arterial (right-of-way is 120-feet, typically 6-lane divided roadways)
- Primary Arterial (right-of-way is 100-120-feet, typically 4-lane divided roadways)
- Secondary Arterial (right-of-way is 80-feet, typically 4-lane undivided roadways)

There are no classified City roadways within the study area.

3.3 CITY OF LOS ALAMITOS

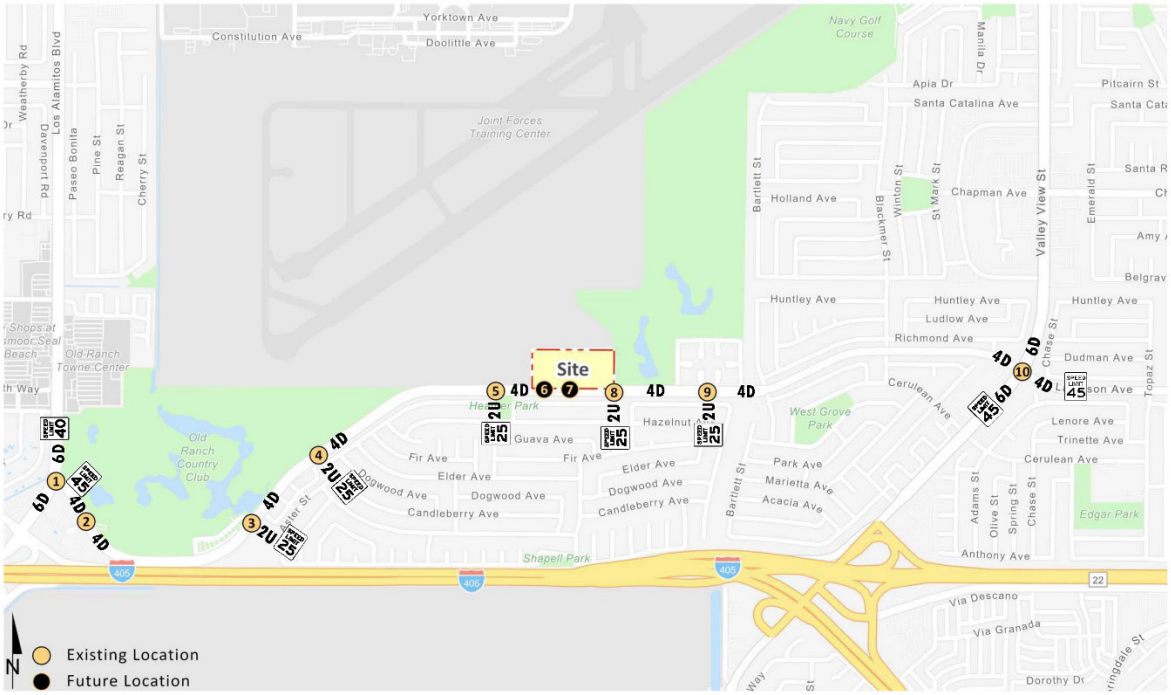
Although the Project site is located within the City of Los Alamitos, the majority of the study area lies within the City of Seal Beach. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified in the City of Seal Beach General Plan Circulation Element, are described subsequently. Exhibit 3-3 shows the City of Seal Beach General Plan Circulation Element and Below is a summary of the major study area roadways and their General Plan classifications:

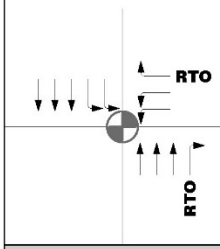
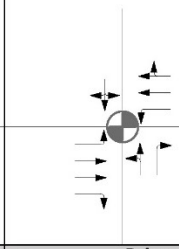
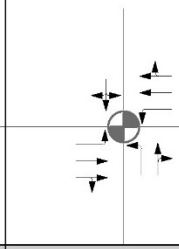
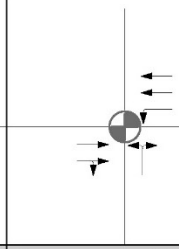
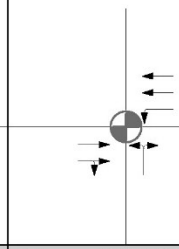
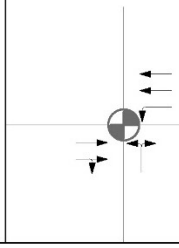
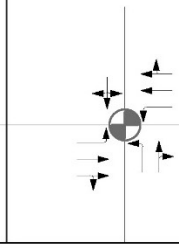
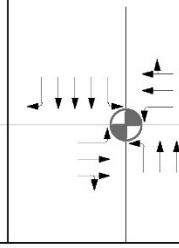
- Major Arterial (right-of-way is 120-feet, typically 6-lane divided roadways): Seal Beach Boulevard
- Primary Arterial (right-of-way is 100-feet, typically 4-lane divided roadways): None
- Secondary Arterial (right-of-way is 80-feet, typically 4-lane undivided roadways): Lampson Avenue
- Principal Roadways: Basswood Street, Candleberry Avenue, Heather Street, Rose Street, Tulip Street

3.3 BICYCLE & PEDESTRIAN FACILITIES

The City of Los Alamitos existing and planned bicycle network is shown on Exhibit 3-4 and the City of Seal Beach's is shown on Exhibit 3-5. There are existing Class II (on-street, striped) bike lanes on the north and south sides of Lampson Avenue from Basswood Street to the east. In addition, there is a Class I bike/pedestrian path on Seal Beach Boulevard north of Lampson Avenue and a Class II bike lane south of Lampson Avenue. The Project should maintain the existing Class II bike lane on Lampson Avenue along its frontage.

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



1 Seal Beach Bl. & Lampson Av.	2 Old Ranch Plaza & Lampson Av.	3 Basswood St. & Lampson Av.	4 Candleberry St. & Lampson Av.	5 Heather St. & Lampson Av.
				
6 Driveway 1 & Lampson Av.	**7 Driveway 2 & Lampson Av.**	**8 Rose St. & Lampson Av.**	**9 Tulip St. & Lampson Av.**	**10 Valley View St. & Lampson Av.**
Future Intersection	Future Intersection			

4 = Number of Lanes
D = Divided
U = Undivided
= Speed Limit (MPH)
= Traffic Signal
= Existing Lane
RTO = Right Turn Overlap

EXHIBIT 3-2: CITY OF LOS ALAMITOS GENERAL PLAN CIRCULATION ELEMENT

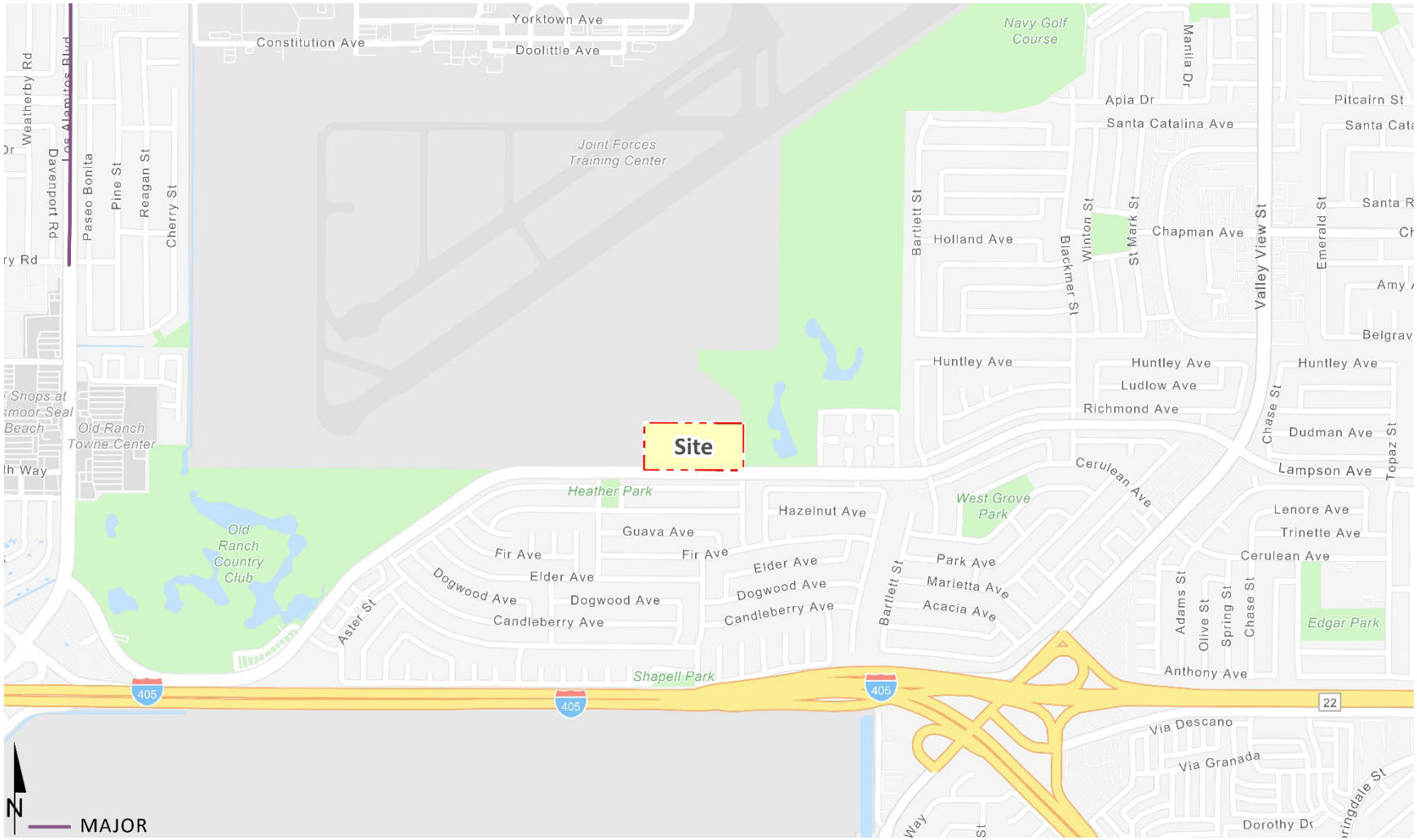


EXHIBIT 3-3: CITY OF SEAL BEACH GENERAL PLAN CIRCULATION ELEMENT

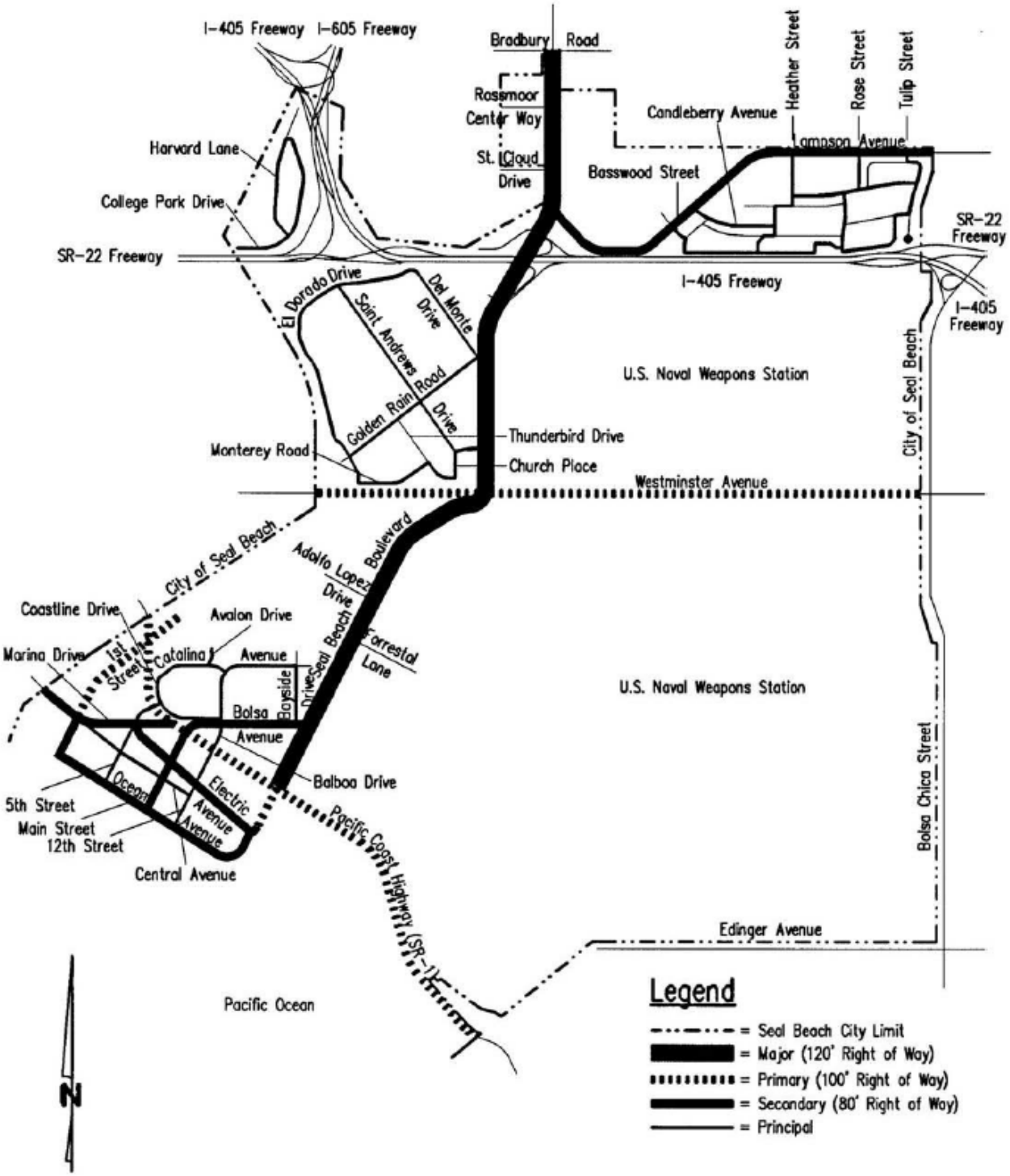


EXHIBIT 3-4: CITY OF LOS ALAMITOS EXISTING AND PLANNED BICYCLE NETWORK

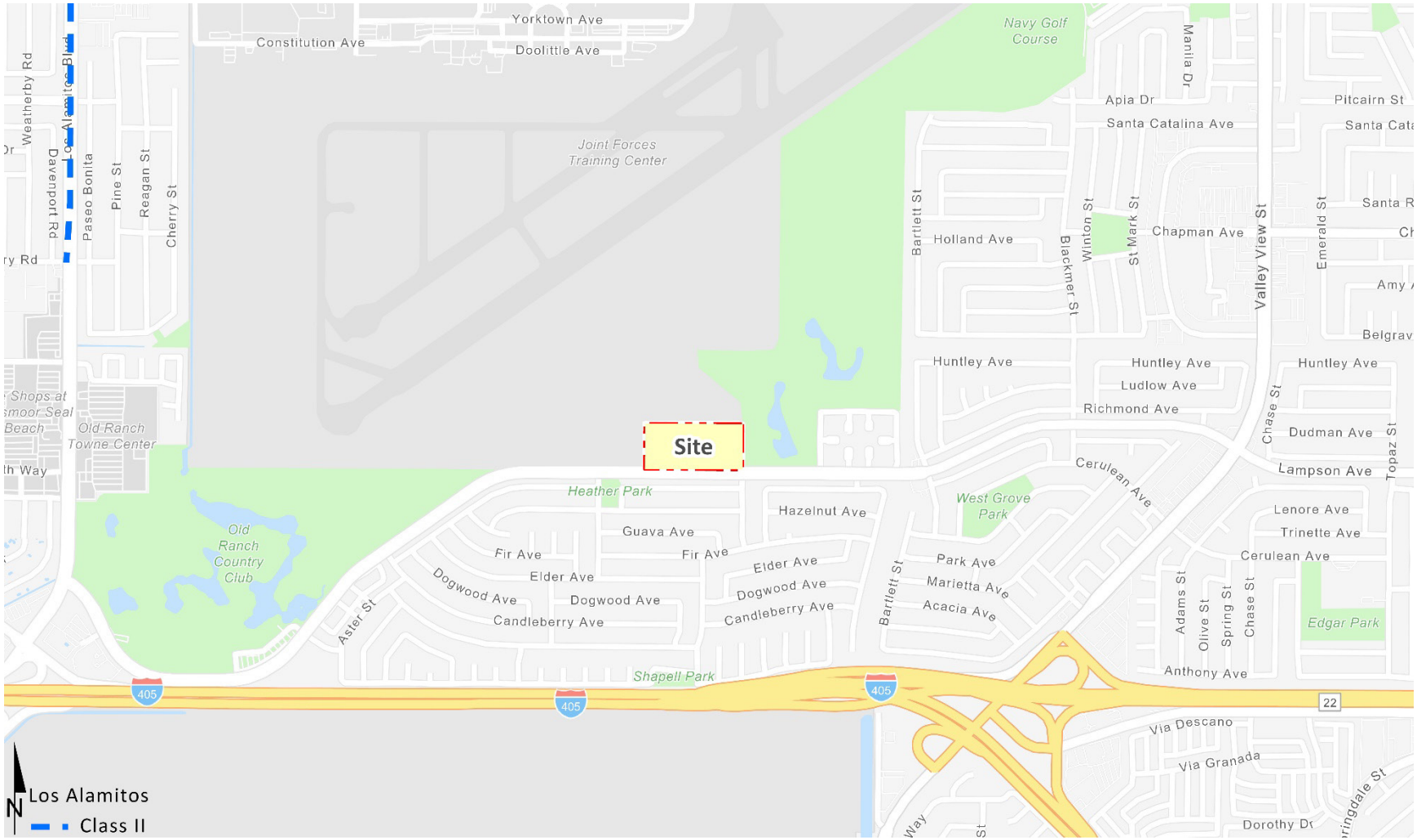


EXHIBIT 3-5: CITY OF SEAL BEACH EXISITNG AND PLANNED BICYCLE NETWORK

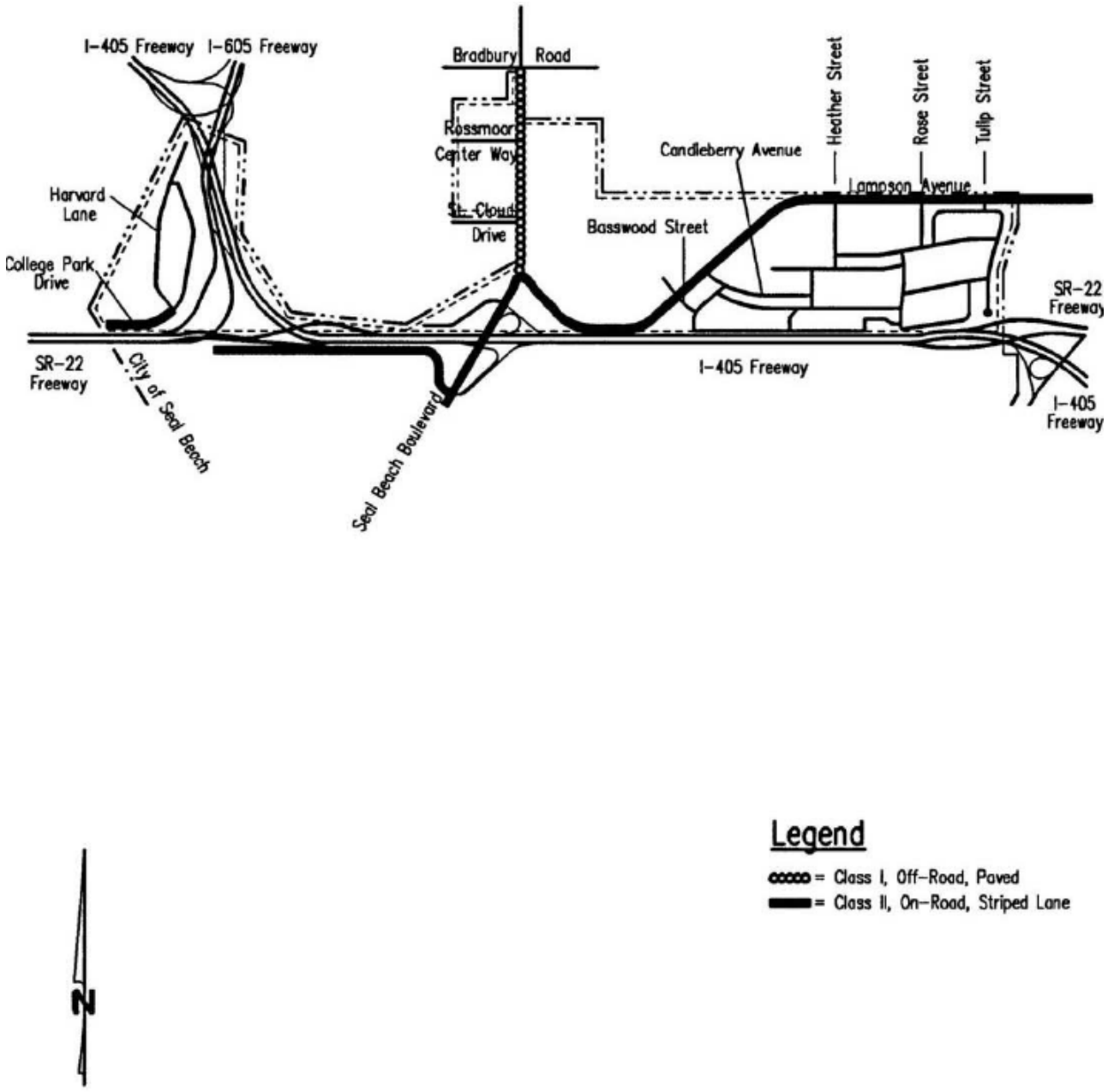


Exhibit 3-6 illustrates the existing crosswalks and existing sidewalks near the study area intersections. As shown on Exhibit 3-6, there are sidewalks provided along the frontage of the Project, however, the sidewalk will be improved with the Project and will accommodate an accessible ramp to the northeast of Rose Street at Lampson Avenue at the existing marked sidewalk to provide connectivity to the existing sidewalk on the south side of Lampson Avenue. The sidewalk on the north side of Lampson begins near Manley Street and continues to the east. The existing sidewalk on the south side of Lampson Avenue starts at Old Ranch Plaza and continues to the east. All signalized study area intersections accommodate at least two approaches that have crosswalks to provide connectivity to the existing sidewalks.

3.4 TRANSIT SERVICE

The study area is currently served by OCTA with bus service along Seal Beach Boulevard, Valley View Street, and Lampson Avenue (east of Valley View Street). OCTA route 42 runs along Seal Beach Boulevard and serves Seal Beach to Orange with an existing stop provided at Lampson Avenue. Bus service frequency is approximately 20-minute intervals during the peak commute hours and 40-mintus during other times of the day during a typical weekday. OCTA Route 123 serves the City of Anaheim to City of Huntington Beach via Malvern Avenue, Valley View Street, and Bolsa Chica. There are existing stops along Valley View Street with an existing stop at Chapman Avenue. Bus service frequency is approximately 60-minute intervals on a typical weekday for OCTA Route 123. The existing bus routes and stops are illustrated on Exhibit 3-7. 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. Transit routes in the area should be reviewed to consider a potential route along Lampson Avenue for service between Seal Beach Boulevard and Valley View Street.

3.5 EXISTING (2022) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in June and September 2022. The following peak hours were selected for analysis:

- AM Peak Period: 7:00-9:00 AM
- PM Peak Period: 4:00-6:00 PM

The 2022 weekday AM and 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. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. Baseline volumes were adjusted to account for volume balancing between intersections so there is no unexplained loss of vehicles between intersections with no other access.

EXHIBIT 3-6: EXISTING PEDESTRIAN FACILITIES

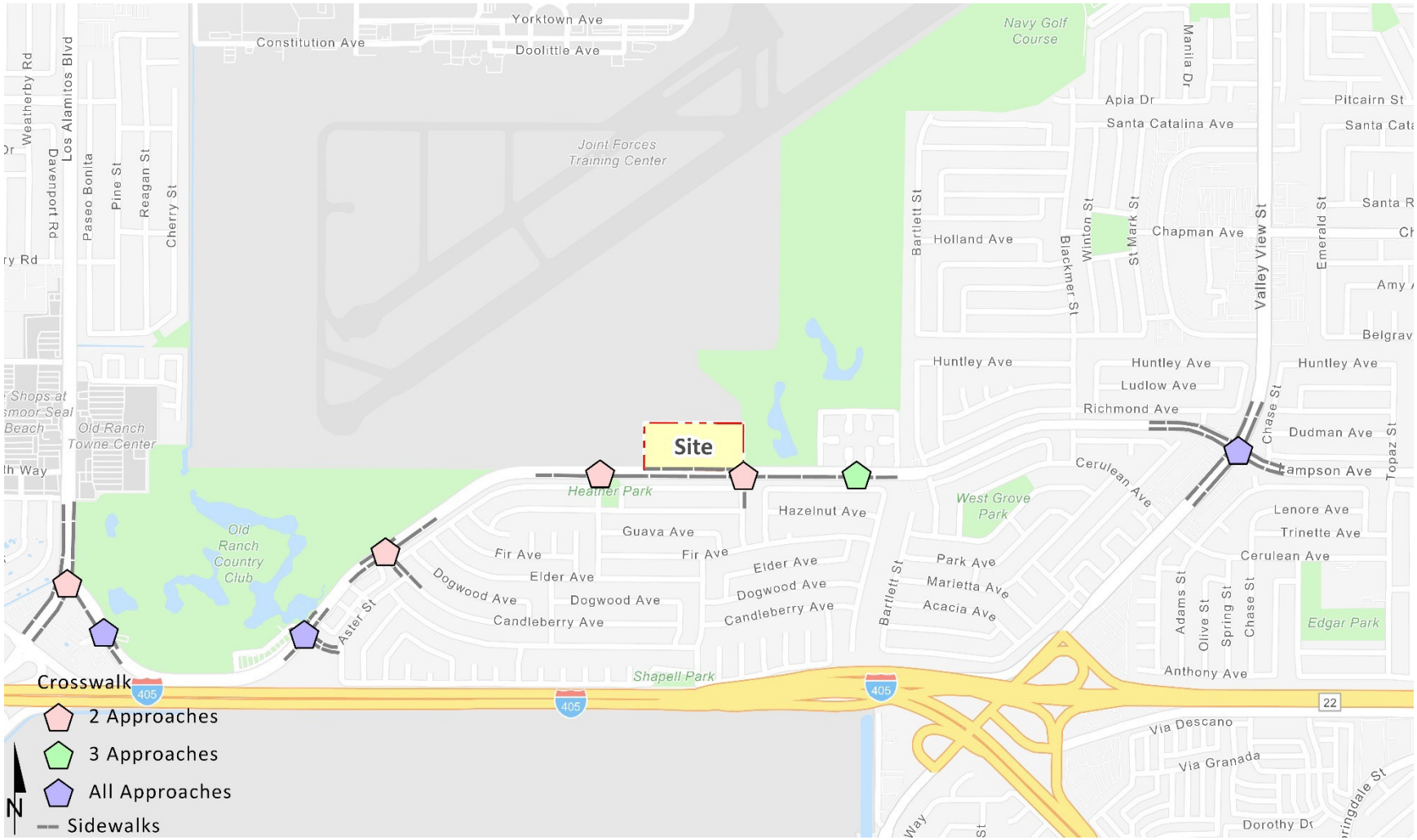
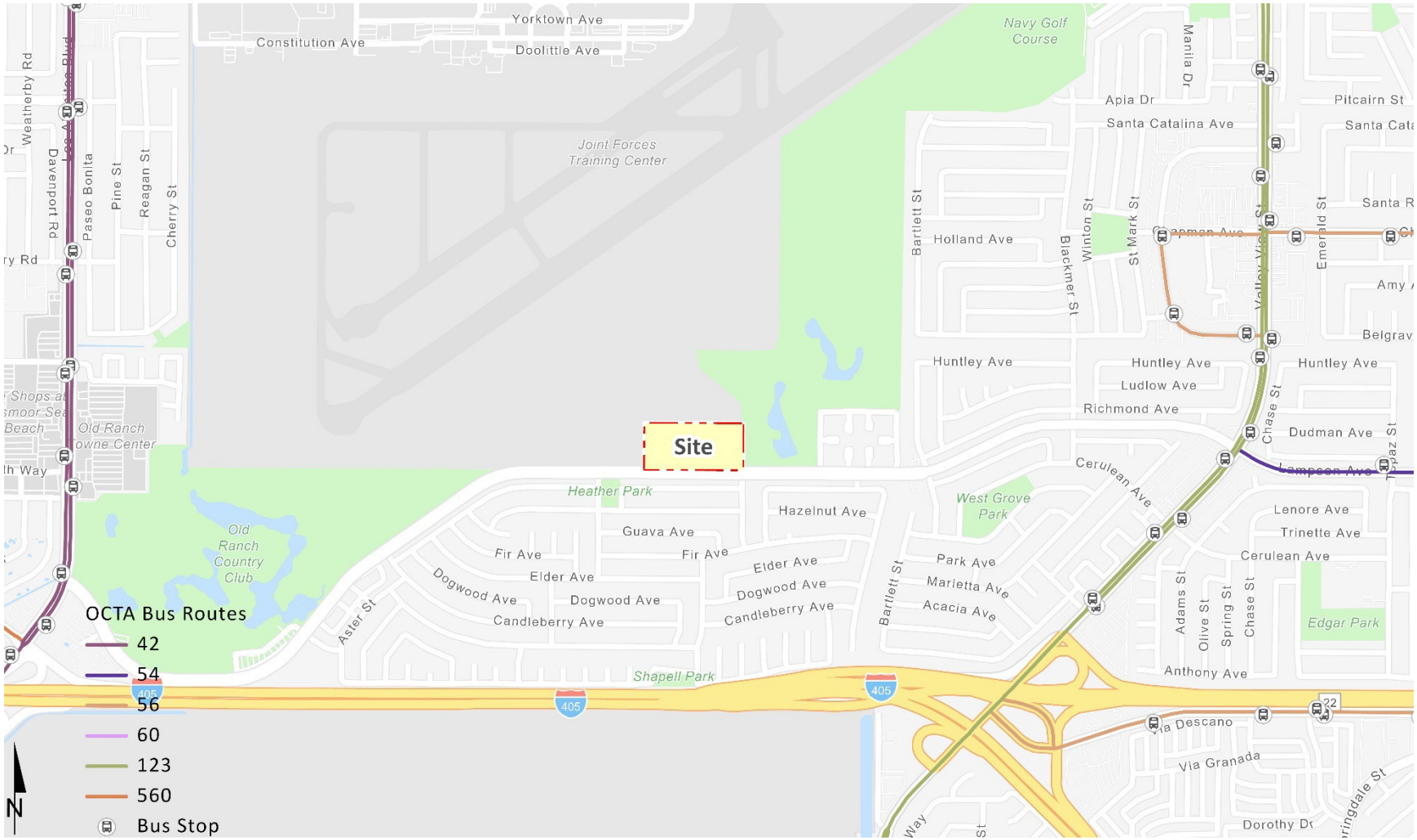


EXHIBIT 3-7: TRANSIT ROUTES



Existing weekday Average Daily Traffic (ADT) volumes are shown on Exhibit 3-8. 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 10.64 = 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 9.40 percent. As such, the above equation utilizing a factor of 10.64 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 9.40 percent (i.e., 1/0.0940 = 10.64) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and PM peak hour intersection volumes are shown on Exhibit 3-8.

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 intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS

#	Intersection	Traffic Control[2]	Delay (secs.) or ICU (v/c)[1] AM	Delay (secs.) or ICU (v/c)[1] PM	Level of Service AM	Level of Service PM
1	Seal Beach Bl. & Lampson Av.	TS	0.79	0.80	C	C
2	Old Ranch Plaza & Lampson Av.	TS	0.40	0.37	A	A
3	Basswood St. & Lampson Av.	TS	0.47	0.45	A	A
4	Candleberry Av. & Lampson Av.	TS	0.39	0.37	A	A
5	Heather St. & Lampson Av.	TS	0.34	0.37	A	A
6	Driveway 1 & Lampson Av.		Future Intersection			
7	Driveway 2 & Lampson Av.		Future Intersection			
8	Rose St. & Lampson Av.	TS	0.30	0.37	A	A
9	Tulip St. & Lampson Av.	TS	0.30	0.37	A	A
10	Valley View St. & Lampson Av.	TS	0.69	0.78	B	C

1 Per the Highway Capacity Manual (6th 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.

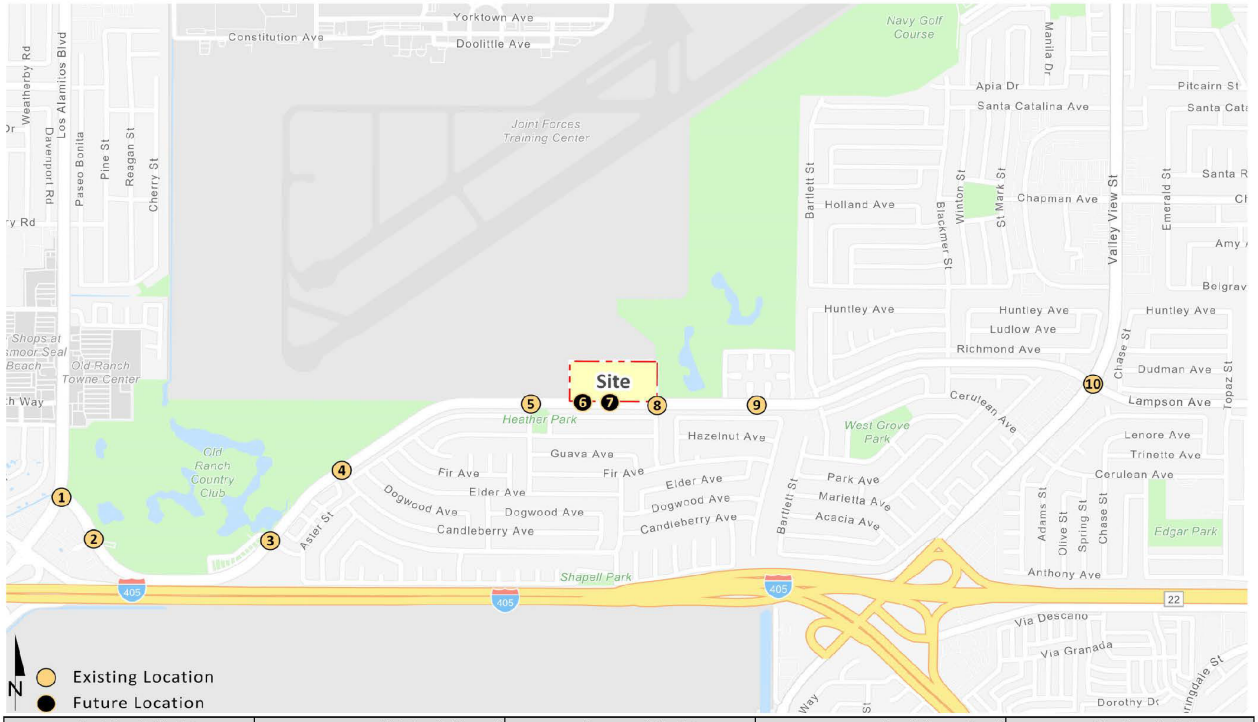
ICU is reported in volume-to-capacity (v/c). ICU analysis conducted for signalized intersections only.

2 TS = Traffic Signal

3.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

All of the existing study area intersections are currently signalized. As such, no traffic signal warrant analysis has been conducted for Existing (2022) traffic conditions.

EXHIBIT 3-8: EXISTING (2022) TRAFFIC VOLUMES



1 Seal Beach Bl. & Lampson Av.			2 Old Ranch Plaza & Lampson Av.			3 Basswood St. & Lampson Av.			4 Candleberry Av. & Lampson Av.			5 Heather St. & Lampson Av.		
38,350		17,350	Nominal		16,650	800		13,150			11,450			11,650
← 1244(1202)	↳ 364(447)	↰ 572(447)	↲ 3(0)	↓ 0(1)	↳ 1(0)	↲ 7(38)	↓ 0(3)	↳ 1(4)			← 574(512)			← 507(484)
		↰ 340(322)			← 880(727)			↰ 6(3)			↰ 16(24)			↰ 30(65)
		→ 1199(1508)			↰ 29(42)			↰ 18(26)			↰ 347(541)			↰ 314(499)
		↱ 266(413)			→ 3(0)			→ 420(638)			→ 77(111)			→ 62(60)
		36,650			↱ 7(10)			↳ 79(116)			↳ 171(70)			↳ 83(52)
					1,000			→ 204(124)			↱ 29(18)			↱ 55(46)
			17,350			16,050		→ 1(0)	13,150		2,350	11,650		2,350
								↱ 3(10)						
								2,800						

6 Driveway 1 & Lampson Av.			7 Driveway 2 & Lampson Av.			8 Rose St. & Lampson Av.			9 Tulip St. & Lampson Av.			10 Valley View St. & Lampson Av.		
		11,450			11,450			12,050	450		13,000	41,500		10,200
		← 542(517)			← 542(517)			← 505(489)			↰ 7(17)			↰ 178(101)
								↰ 25(65)	↲ 14(11)	↓ 1(0)	← 477(516)	↲ 151(202)	↓ 1529(1688)	← 184(208)
								↰		↳ 10(8)	↰ 32(76)		↳ 105(145)	↰ 184(169)
								→ 336(528)	↳ 5(7)		↰	↳ 150(211)		↰
								↳ 24(33)	→ 366(545)		→ 39(27)	→ 234(200)		→ 115(185)
								↱ 37(28)	↳ 11(27)		↑ 1(0)	↳ 126(108)		↑ 115(185)
360(561) →			360(561) →					↳ 46(51)			↱ 73(60)			↱ 165(134)
11,450			11,450			11,450		1,900	12,050		2,000	11,850		40,850

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

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4 PROJECTED FUTURE TRAFFIC

The Project consists of the development of 55 single family detached residential dwelling units (cluster homes), 114 multifamily (low-rise) residential dwelling units, and 77 affordable apartment dwelling units (total of 246 dwelling units). Access to the Project site will be accommodated to Lampson Avenue via two proposed driveways. The site is currently occupied by the California Department of Fish and Wildlife building and parking lot; however, no credit has been taken for the existing use for the purposes of this traffic study in an effort to conduct a conservative analysis.

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.

4.1.1 PROPOSED PROJECT

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the ITE Trip Generation Manual (11th Edition, 2021) for the Single Family Detached Residential Land Use category (ITE Land Use Code 210), Multifamily (Low-Rise) Housing (ITE Land Use Code 220), and Affordable Housing (ITE Land Use Code 223) were used to calculate the Project trip generation (see Table 4-1 for rates). The trip generation summary illustrating daily, and peak hour trip generation estimates for the proposed Project are also shown on Table 4-1. The proposed Project is anticipated to generate 1,658 two-way trip-ends per day with 112 AM peak hour trips and 147 PM peak hour trips.

TABLE 4-1: PROJECT TRIP GENERATION SUMMARY

		ITE LU	AM Peak Hour			PM Peak Hour			
Land Use[1]	Units[2]	Code	In	Out	Total	In	Out	Total	Daily
Single Family Detached	DU	210	0.18	0.52	0.70	0.59	0.35	0.94	9.43
Multifamily Housing (Low-Rise) (2-3 Floors)	DU	220	0.10	0.30	0.40	0.32	0.19	0.51	6.74
Affordable Housing	DU	223	0.10	0.26	0.36	0.27	0.19	0.46	4.81

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

[2] DU = Dwelling Units

			AM Peak Hour			PM Peak Hour			
Land Use	Quantity	Units[1]	In	Out	Total	In	Out	Total	Daily
Single Family Detached	55	DU	10	28	38	33	19	52	520
Multifamily Housing	114	DU	11	35	46	37	22	59	768
Affordable Housing	77	DU	8	20	28	21	15	36	370
Project Total Trips			**29**	**83**	**112**	**91**	**56**	**147**	**1,658**

[1] DU = Dwelling Units

4.1.2 PROJECT ALTERNATIVE

The proposed Project is considering an alternative that replaces the affordable housing with age-restricted housing (attached product type). The trip generation rates for the Project including the alternative attached senior housing (see Table 4-2 for rates). The trip generation summary illustrating daily, and peak hour trip generation estimates for the Project Alternative are also shown on Table 4-2. The Project Alternative is anticipated to generate 1,538 two-way trip-ends per day with 99 AM peak hour trips and 130 PM peak hour trips. As shown, the Project Alternative generates 120 fewer two-way trip-ends per day with 13 fewer AM peak hour trips and 17 fewer PM peak hour trips.

TABLE 4-2: PROJECT ALTERNATIVE TRIP GENERATION SUMMARY

		ITE LU	AM Peak Hour			PM Peak Hour			
Land Use[1]	Units[2]	Code	In	Out	Total	In	Out	Total	Daily
Single Family Detached	DU	210	0.18	0.52	0.70	0.59	0.35	0.94	9.43
Multifamily Housing (Low-Rise) (2-3 Floors)	DU	220	0.10	0.30	0.40	0.32	0.19	0.51	6.74
Senior Housing - Attached	DU	252	0.07	0.13	0.20	0.14	0.11	0.25	3.24

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

[2] DU = Dwelling Units

			AM Peak Hour			PM Peak Hour			
Land Use	Quantity	Units[1]	In	Out	Total	In	Out	Total	Daily
Single Family Detached	55	DU	10	28	38	33	19	52	520
Multifamily Housing	114	DU	11	35	46	37	22	59	768
Senior Housing Attached	77	DU	5	10	15	11	8	19	250
Project Alternative Total Trips			**26**	**73**	**99**	**81**	**49**	**130**	**1,538**
Proposed Project Total Trips			29	83	112	91	56	147	1,658
Variance (Alternative - Proposed)			**-3**	**-10**	**-13**	**-10**	**-7**	**-17**	**-120**

[1] DU = Dwelling Units

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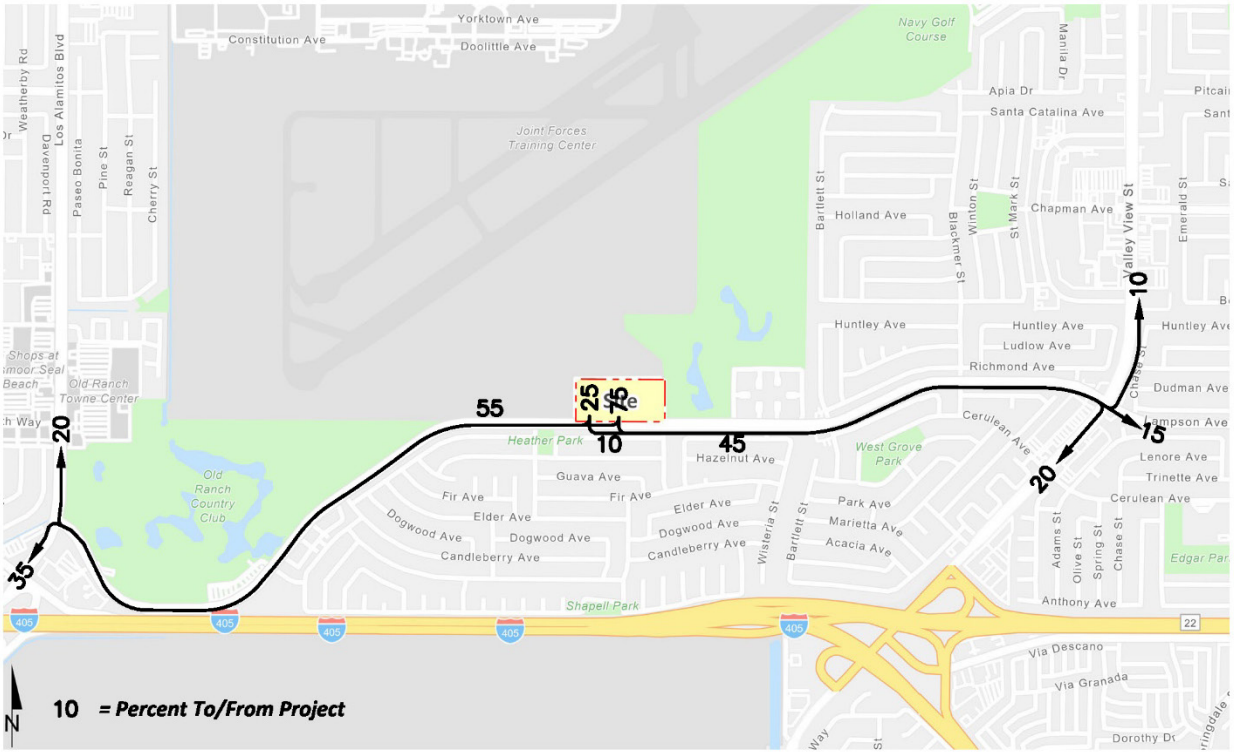
4.2 PROJECT TRIP DISTRIBUTION

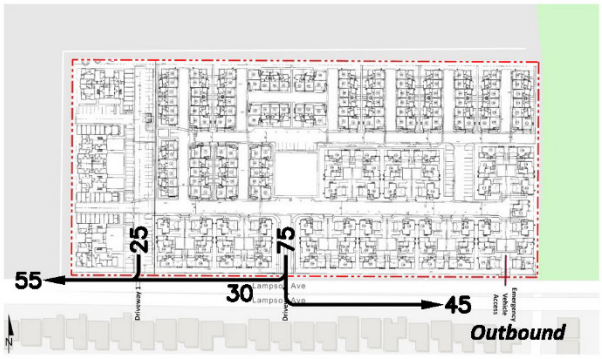
The Project trip distribution represents the directional orientation of traffic to and from the Project site. Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. Exhibit 4-1 shows the Project trip distribution patterns which was reviewed as part of the traffic study scoping process (see Appendix 1.1).

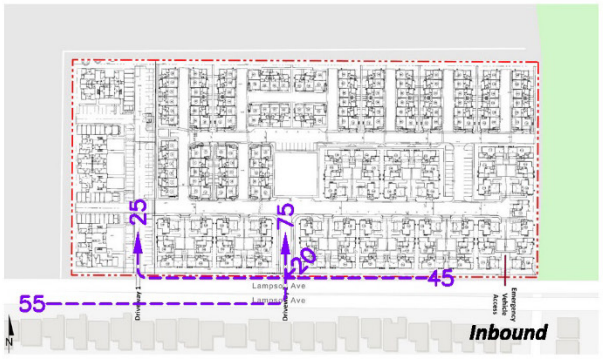
4.3 MODAL SPLIT

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.

EXHIBIT 4-1: PROJECT TRIP DISTRIBUTION







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 only ADT and weekday AM and PM peak hour intersection turning movement volumes are shown on Exhibit 4-2.

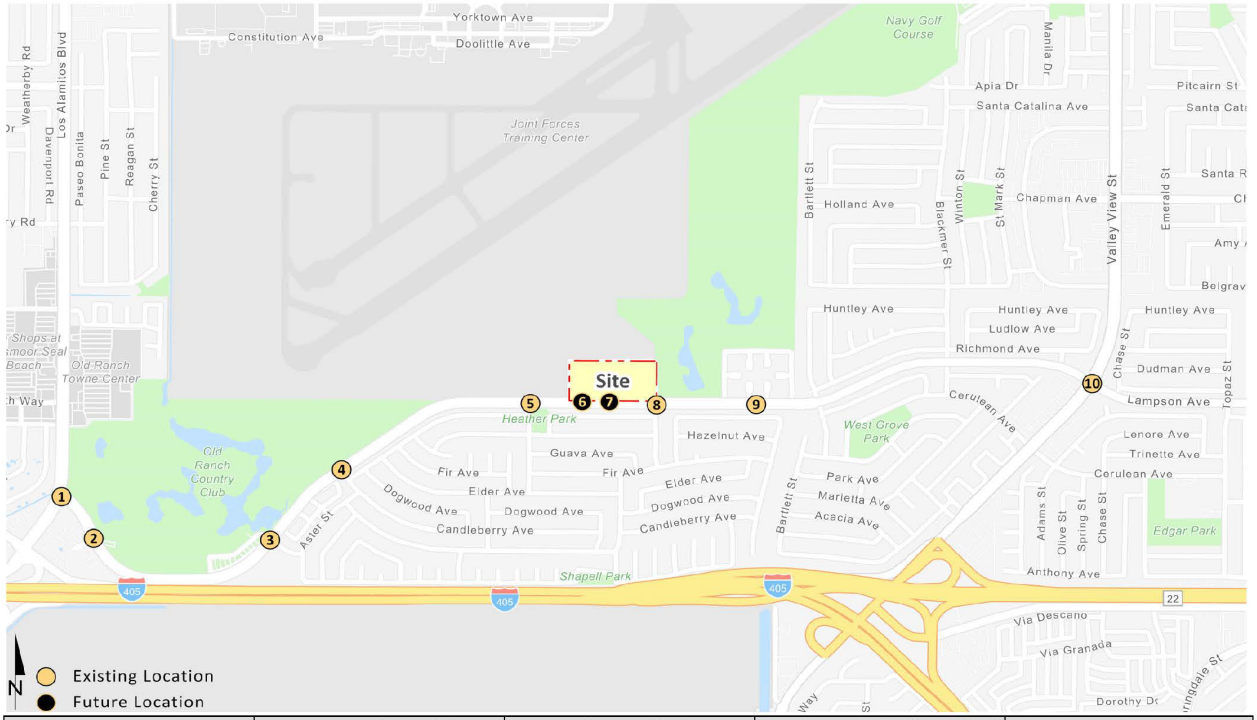
4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 2.0% per year for 2026 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 8.24% for 2026 traffic conditions (growth of 2.0 percent per year over 4 years). 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 addition to 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. Opening Year Cumulative (2026) traffic volumes are provided in Section 6 of this report.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning staff from the City of Los Alamitos. 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 4-3. 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 Cumulative ADT and weekday AM and PM peak hour intersection turning movement volumes for all cumulative development projects are shown on Exhibit 4-4.

EXHIBIT 4-2: PROJECT ONLY TRAFFIC VOLUMES



1 Seal Beach Bl. & Lampson Av.	2 Old Ranch Plaza & Lampson Av.	3 Basswood St. & Lampson Av.	4 Candleberry Av. & Lampson Av.	5 Heather St. & Lampson Av.
350 / 900 / 600 6(18) ↳ ← 17(11) ← 29(20) ↱ 10(32)	900 / 900 ← 46(31) 16(50) →	900 / 900 ← 46(31) 16(50) →	900 / 900 ← 46(31) 16(50) →	900 / 900 ← 46(31) 16(50) →

6 Driveway 1 & Lampson Av.	7 Driveway 2 & Lampson Av.	8 Rose St. & Lampson Av.	9 Tulip St. & Lampson Av.	10 Valley View St. & Lampson Av.
400 / 900 21(14) ↳ ← 7(23) ← 25(17) 16(50) → / 900	1,250 / 750 25(17) ↳ 37(25) ↳ ← 6(18) ← 7(23) 16(50) → / 900	750 ← 13(41) 37(25) → / 750	750 ← 13(41) 37(25) → / 750	150 / 250 3(9) ↳ ← 4(14) 8(6) → 12(8) → 17(11) ↴ 6(18) ↰ 6(18) ↑ / 750 / 350

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

EXHIBIT 4-3: CUMULATIVE DEVELOPMENT LOCATION MAP

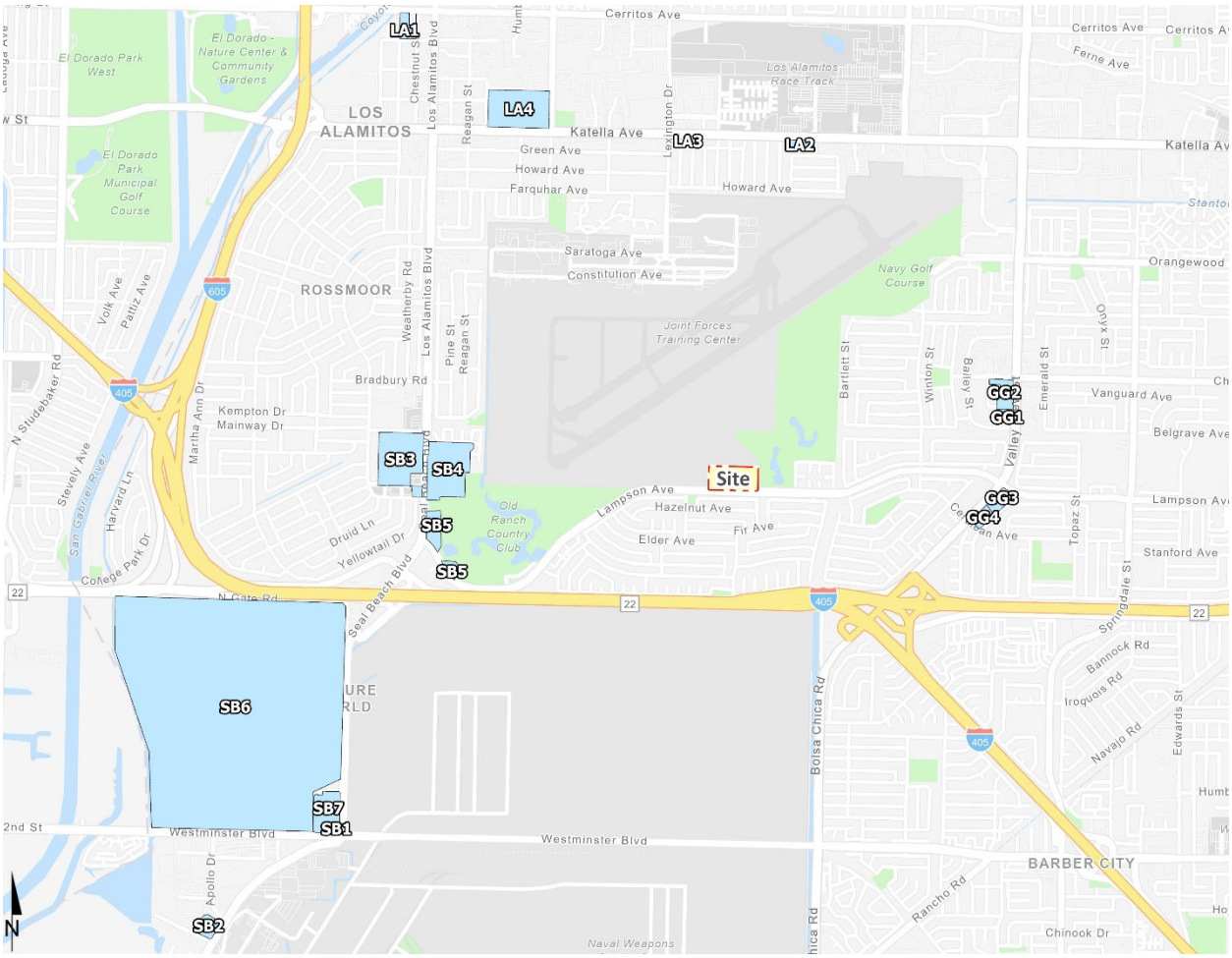
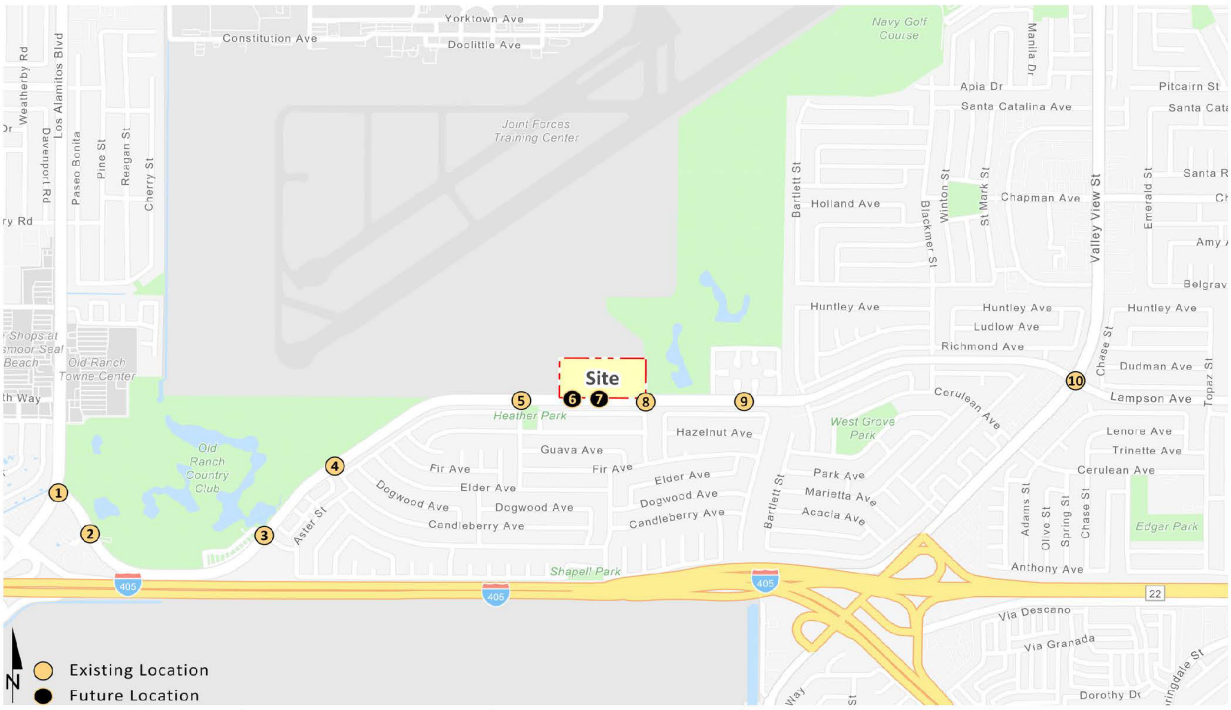


EXHIBIT 4-4: CUMULATIVE ONLY TRAFFIC VOLUMES



1 Seal Beach Bl. & Lampson Av.	2 Old Ranch Plaza & Lampson Av.	3 Basswood St. & Lampson Av.	4 Candleberry Av. & Lampson Av.	5 Heather St. & Lampson Av.
2,600 / 1,550	800 / 1,000	1,000	1,100	1,150
← 100(66) ↳ 41(35)	↰ 2(6) ← 29(46)	← 30(51)	← 30(51) ↰ 5(4)	← 35(55) ↰ 5(4)
↰ 27(36) ← 32(29)	↲ 31(20) ↳ 5(3)			
↑ 47(89) ↱ 28(37)	10(33) ↳ 58(39) →	63(42) →	63(42) → ↱ 6(5)	69(47) → ↱ 6(5)
2,550	1,550	1,000	1,000 / 100	1,100 / 100

6 Driveway 1 & Lampson Av.	7 Driveway 2 & Lampson Av.	8 Rose St. & Lampson Av.	9 Tulip St. & Lampson Av.	10 Valley View St. & Lampson Av.
1,150	1,150	1,250	Nominal / 1,350	1,150 / 400
← 39(59)	← 39(59)	← 39(59) ↰ 5(4)	↰ 2(2) ← 44(63) ↰ 5(4)	↲ 25(16) ↓ 21(17) ↳ 10(15) ↰ 35(31) ← 21(13)
75(52) →	75(52) →	75(52) → ↱ 6(5)	2(2) ↳ 80(57) → ↱ 6(5)	34(26) ↳ 19(21) ↴ ↰ 17(22) ↑ 17(22) ↱ 8(16)
1,150	1,150	1,150 / 100	1,250 / 100	1,450 / 950

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

ID	Project	Land Use	Quantity	Unit[1]
Los Alamitos				
LA1	Los Alamitos Luxury Apartments	Multifamily (Low-Rise) Housing	107	DU
LA2	Chevron Gas Station	Gas Station w/ Convenience Store	2.724	TSF
LA3	4562 Katella Avenue	Medical Office Building	5.200	TSF
LA4	Los Alamitos Medical Center (Phase 2 & 3)	Hospital Building I	92	Beds
		Hospital Building II	126	Beds
Seal Beach				
SB1	13980 Seal Beach Boulevard Project/Hydrogen Fueling Station	Hydrogen Fueling Facility	1.010	TSF
SB2	Accurate Storage	Multifamily (Mid-Rise) Housing	59	DU
SB3	Shops at Rossmoor	Multifamily (Mid-Rise) Housing	400	DU
SB4	Old Ranch Town Center	Multifamily (Mid-Rise) Housing	200	DU
SB5	Old Ranch Country Club	Multifamily (Low-Rise) Housing	120	DU
SB6	Leisure World	Multifamily (Mid-Rise) Housing	150	DU
SB7	Seal Beach Plaza	Multifamily (Mid-Rise) Housing	75	DU
Garden Grove				
GG1	Valley View Lanes (CUP-211-2021)	Bowling Alley	13.740	TSF
GG2	12141 Valley View Street	Restaurant	7.214	TSF
		Drive-Thru Restaurant	2.000	TSF
GG3	Marley's Preschool (CUP-212-2021)	Preschool/Day Care	84	STU
GG4	Pro Athletics (CUP-216-2022)	Athletic & Health Club/Gym	7.100	TSF

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

4.7 VOLUME DEVELOPMENT FOR GENERAL PLAN BUILDOUT CONDITIONS

Traffic projections for General Plan Buildout Without Project and With Project conditions were derived from the OCTAM Version 5.5 maintained by the OCTA. Based on the city-wide land use data and the regional socioeconomic growth projections, future trip activity is estimated and assigned to the roadway circulation system. Model output is post-processed based on established postprocessing methodologies. The post-processor applies the model's projected growth to each turning movement for both General Plan Buildout Without and With Project scenarios, forecasting a value that reflects future growth.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2022) conditions and General Plan Buildout traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the General Plan Buildout peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in June/September 2022. The OCTAM has a base (validation) year of 2016 and a horizon (future forecast) year of 2045. The difference in model volumes (2045-2016) defines the growth in traffic over the 29-year period.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 765), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The OCTAM uses an AM peak period-to-peak hour factor of 0.36 and a PM peak period-to-peak hour factor of 0.266. These factors represent the relationship of the highest single AM peak hour to the modeled 3-hour AM peak period (an even distribution would result in a factor of 0.33) and the highest single PM peak hour to the modeled 4-hour PM peak period (an even distribution would result in a factor of 0.25). Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent General Plan Buildout traffic conditions. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing traffic conditions were not assumed as part of this analysis. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the General Plan Buildout peak hour forecasts.

The future General Plan Buildout Without Project and With 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. Post processing has been performed for the weekday AM and PM peak hours only as these are the only time periods where traffic model data was readily available. The post processed volumes for General Plan Buildout Without Project traffic conditions are provided in Appendix 4.1.

Only the intersections of Seal Beach Boulevard at Lampson Avenue and Valley View Street at Lampson Avenue are modeled in OCTAM. All other study area intersections are not reflected in the traffic model. As such, the traffic volumes at all remaining study intersections have been calculated by applying an ambient growth factor from Existing (2022) conditions of 14% in conjunction with the traffic generated by other known or probable related projects. The total growth between existing and General Plan Buildout conditions has been determined by calculating the average growth observed at the two modeled intersections.

5 OPENING YEAR CUMULATIVE (2026) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year Cumulative (2026) 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 Cumulative conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- 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 Cumulative conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

5.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 8.24% plus traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2026) Without Project traffic conditions are shown on Exhibit 5-1.

5.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2026) Without Project volumes plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2026) With Project traffic conditions are shown on Exhibit 5-2.

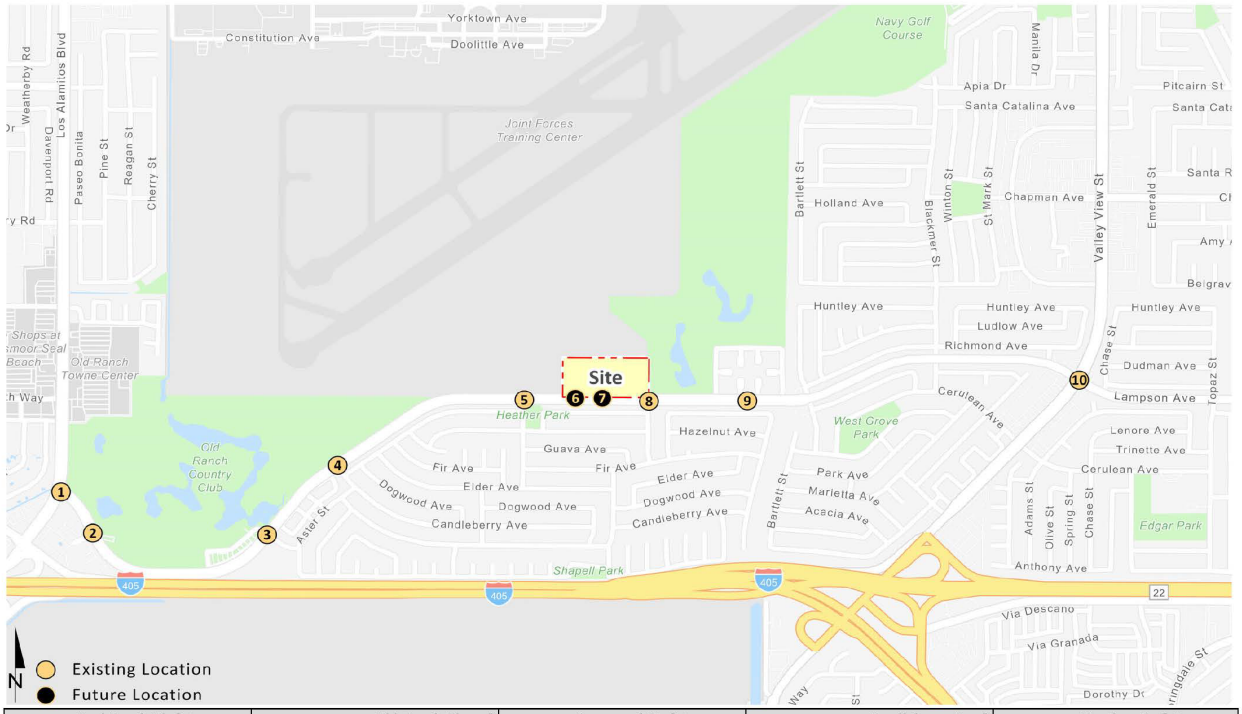
5.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative 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 Cumulative traffic conditions, which indicates that the following study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under Opening Year Cumulative (2026) Without Project traffic conditions:

- Seal Beach Bl. & Lampson Av. (#1) – LOS E AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for Opening Year Cumulative (2026) Without Project traffic conditions. However, the addition of Project traffic is anticipated to increase the v/c ratio by more than 0.01 at the intersection of Seal Beach Boulevard and Lampson Avenue. As such, improvements are provided for the deficient intersection.

EXHIBIT 5-1: OPENING YEAR CUMULATIVE (2026) WITHOUT PROJECT TRAFFIC VOLUMES



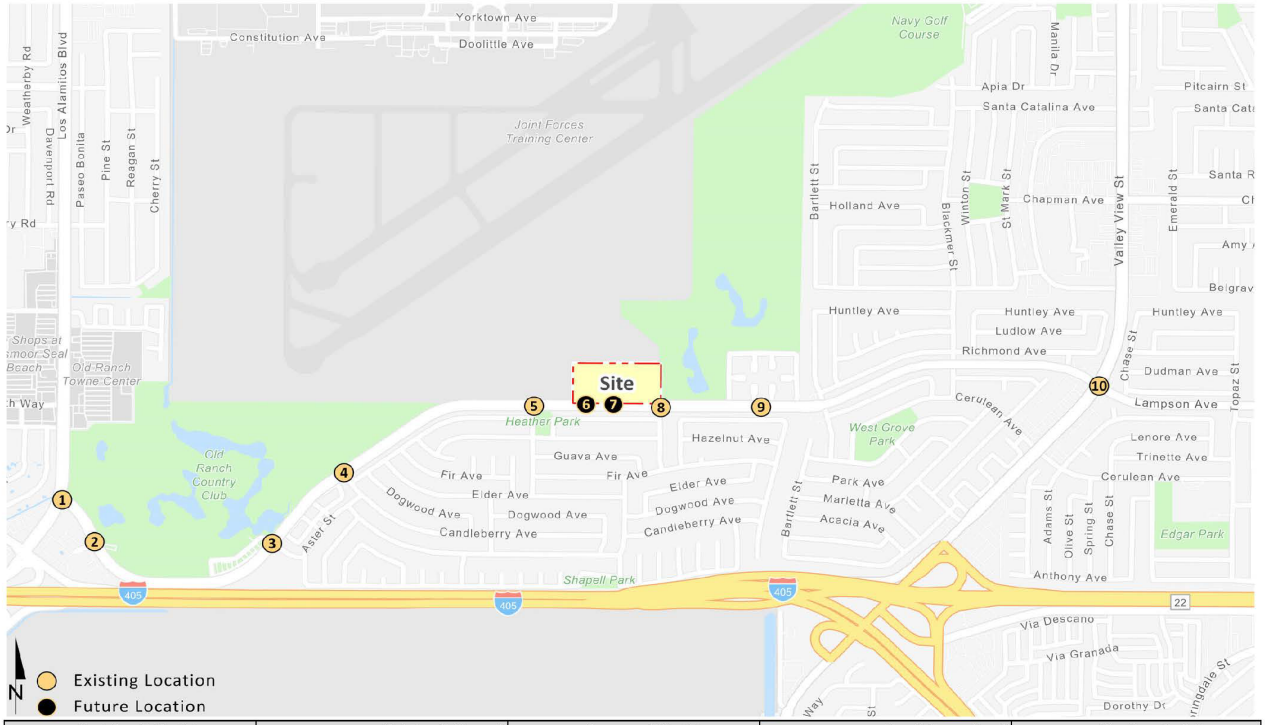
1 Seal Beach Bl. & Lampson Av.	2 Old Ranch Plaza & Lampson Av.	3 Basswood St. & Lampson Av.	4 Candleberry Av. & Lampson Av.	5 Heather St. & Lampson Av.
44,150	850	850		
1447(13367) ←	34(20) ↲	8(41) ↲		
435(519) ↳	0(1) ↓	0(3) ↓		
20,350	6(3) ↳	1(4) ↳	13,500	13,750
646(520) ↰	19,050	15,200	651(605) ←	584(579) ←
400(378) ↰	5(6) ↰	6(3) ↰	22(30) ↰	37(74) ↰
1345(1721) →	982(833) ←	820(666) ←	185(76) ↰	
316(484) ↱	11(8) ↰	10(12) ↰	37(24) ↱	
42,250	18(37) →	19(28) →	439(628) →	409(587) →
	698(929) →	518(733) →	83(120) ↴	67(65) ↴
	35(37) ↴	86(126) ↴		90(56) ↰
	31(45) ↰	221(134) ↰		66(55) ↱
	3(0) ↑	1(0) ↑		
	8(11) ↱	3(11) ↱		
	1,100	3,050	2,650	2,650
20,350	20,350	18,400	15,200	13,700

6 Driveway 1 & Lampson Av.	7 Driveway 2 & Lampson Av.	8 Rose St. & Lampson Av.	9 Tulip St. & Lampson Av.	10 Valley View St. & Lampson Av.
			550	46,100
			15(12) ↲	188(235) ↲
			1(0) ↓	1676(1844) ←
13,600	13,600	14,300	13(11) ↳	124(172) ↳
← 626(619)	← 626(619)	← 586(588)	15,450	11,400
		↰ 32(74)	↰ 10(20)	↰ 214(122)
		↰	← 560(622)	← 199(225)
465(659) →	465(659) →	439(624) →	↰ 40(86)	↰ 234(214)
		26(36) ↴	5(8) →	196(254) →
		40(30) ↰	476(647) →	253(216) →
		56(60) ↱	12(29) ↴	155(138) ↴
		2,100	42(29) ↰	141(222) ↰
			1(0) ↑	141(222) ↑
			85(70) ↱	187(161) ↱
13,600	13,600	13,600	14,300	14,300
			2,250	45,150

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

EXHIBIT 5-2: OPENING YEAR CUMULATIVE (2026) WITH PROJECT TRAFFIC VOLUMES



1 Seal Beach Bl. & Lampson Av.	2 Old Ranch Plaza & Lampson Av.	3 Basswood St. & Lampson Av.	4 Candleberry Av. & Lampson Av.	5 Heather St. & Lampson Av.
44,450 / 21,250	850 / 19,950	850 / 16,150	14,400	14,700
1447(1367) ↓	34(20) ↲	8(41) ↲		
441(537) ↳	0(1) ↓	0(3) ↓		
663(531) ↱	6(3) ↳	1(4) ↳	697(636) ←	630(610) ←
429(398) ↰	5(6) ↱	6(3) ↱	22(30) ↰	37(74) ↰
	1028(864) ←	866(697) ←		
	11(8) ↰	10(12) ↰		
1345(1721) → ↱	18(37) → ↰	19(28) → ↰	455(678) → ↰	425(637) → ↰
326(516) ↱	714(979) → ↑	534(783) → ↑	83(120) ↴ ↱	67(65) ↴ ↱
	35(37) ↴ ↱	86(126) ↴ ↱	185(76)	90(56)
	31(45)	221(134)	37(24)	66(55)
	3(0)	1(0)		
	8(11)	3(11)		
42,850	1,100 / 21,250	3,050 / 19,300	2,650 / 16,150	2,650 / 14,600

6 Driveway 1 & Lampson Av.	7 Driveway 2 & Lampson Av.	8 Rose St. & Lampson Av.	9 Tulip St. & Lampson Av.	10 Valley View St. & Lampson Av.
400 / 14,500	1,250 / 14,350	15,050	550 / 16,200	46,300 / 11,650
21(14) ↲	25(17) ↲		15(12) ↲	191(244) ↲
	37(25) ↳		1(0) ↓	1676(1844) ↓
7(23) ↱	6(18) ↱	599(629) ←	13(11) ↳	124(172) ↳
651(636) ←	633(642) ←	32(74) ↰	10(20) ↱	214(122) ↱
			573(663) ←	203(239) ←
			40(86) ↰	234(214) ↰
481(709) →	16(50) →		5(8) →	204(260) →
	465(659) →	476(649) →	513(672) →	265(224) →
		26(36) ↴	12(29) ↴	172(149) ↴
		40(30)	42(29)	147(240)
		56(60)	1(0)	147(240)
			85(70)	187(161)
14,500	14,500	14,350 / 2,100	15,050 / 2,250	15,000 / 45,500

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

Although the intersection of Valley View Street at Lampson Avenue is anticipated to operate at a deficient LOS based on the ICU methodology, a more detailed peak hour intersection operations assessment based on the HCM methodology indicates acceptable peak hour operations. As such, no intersection improvements have been recommended at the intersection of Valley View Street and Lampson Avenue. The intersection operations analysis worksheets for Opening Year Cumulative (2026) Without and With Project traffic conditions are included in Appendix 5.1 and Appendix 5.2 of this TA, respectively.

TABLE 5-1: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2026) CONDITIONS

			2026 Without Project				2026 With Project			
			Delay (secs.) or ICU (v/c)[1]		Level of Service		Delay (secs.) or ICU (v/c)[1]		Level of Service	
#	Intersection	Traffic Control[2]	AM	PM	AM	PM	AM	PM	AM	PM
1	Seal Beach Bl. & Lampson Av.	TS	**0.92**	**0.95**	**E**	**E**	**0.93**	**0.96**	**E**	**E**
2	Old Ranch Plaza & Lampson Av.	TS	0.46	0.44	A	A	0.48	0.45	A	A
3	Basswood St. & Lampson Av.	TS	0.51	0.49	A	A	0.53	0.51	A	A
4	Candleberry Av. & Lampson Av.	TS	0.44	0.42	A	A	0.46	0.43	A	A
5	Heather St. & Lampson Av.	TS	0.38	0.42	A	A	0.39	0.44	A	A
6	Driveway 1 & Lampson Av.	**CSS**	Future Intersection				10.9	10.8	B	B
7	Driveway 2 & Lampson Av.	**CSS**	Future Intersection				14.8	15.6	B	C
8	Rose St. & Lampson Av.	TS	0.34	0.41	A	A	0.35	0.42	A	A
9	Tulip St. & Lampson Av.	TS	0.34	0.42	A	A	0.35	0.42	A	A
10	Valley View St. & Lampson Av.	TS	0.80	**0.90**	D	**E**	0.82	**0.92**	D	**E**
	HCM Analysis:		31.4	36.5	C	D	33.3	40.6	C	D

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

[1] Per the Highway Capacity Manual (6th 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.

ICU is reported in volume-to-capacity (v/c). ICU analysis conducted for signalized intersections only.

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

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

All existing study area intersections are currently signalized. As such, no traffic signal warrant analysis has been conducted for Opening Year Cumulative (2026) Without Project traffic conditions. The intersection of Driveway 2 at Lampson Avenue is not anticipated to warrant a peak hour or planning-level (ADT) based warrant under Opening Year Cumulative (2026) With Project traffic conditions. The traffic signal warrant analysis worksheets for Opening Year Cumulative (2026) With Project traffic conditions are included in Appendix 5.3 of this TA.

5.6 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of deficiencies and recommended improvements for Opening Year Cumulative (2026) traffic conditions. Based on deficiency criteria discussed in Section 2.5 *Deficiency Criteria*, the following intersection was found to be deficient. Improvements necessary to improve the traffic deficiency back to acceptable levels is discussed below.

Seal Beach Boulevard & Lampson Avenue (#1): The intersection of Seal Beach Boulevard and Lampson Avenue is anticipated to meet the applicable deficiency criteria for LOS. As shown in Table 5-2, restriping the number two westbound left turn lane as a shared left-right turn lane would improve the intersection operations back to acceptable LOS.

The intersection operations analysis worksheets for Opening Year Cumulative (2026) With Project traffic conditions, with improvements, are included in Appendix 5.4 of this TA.

TABLE 5-2: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2026) CONDITIONS WITH IMPROVEMENTS

			Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Seal Beach Bl. & Lampson Av.																	
	- Without Improvements	TS	0	3	1>	2	3	0	0	0	0	2	0	1>	**0.93**	**0.96**	**E**	**E**
	- With Improvements[4]	TS	0	3	1>	2	3	0	0	0	0	**1**	**1**	1>	0.75	0.82	C	D

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the Highway Capacity Manual 6th 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.

[3] TS = Traffic Signal

[4] Improvement includes restriping the number 2 westbound left as a shared left-right turn lane.

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6 GENERAL PLAN BUILDOUT TRAFFIC CONDITIONS

This section discusses the traffic forecasts for General Plan Buildout conditions 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 on Exhibit 3-1, with the exception of the following:

- 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 conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for General Plan Buildout conditions (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

6.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

For the intersections of Seal Beach Boulevard at Lampson Avenue and Valley View Steet at Lampson Avenue the General Plan Buildout Without Project weekday AM and PM peak hour volumes are based on the OCTAM traffic model. For the remaining study intersections, the scenario includes Existing traffic volumes plus an ambient growth factor of 14% plus traffic from pending and approved but not yet constructed known development projects in the area (see Section 4.7 for additional discussion on volume development). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for General Plan Buildout Without Project traffic conditions are shown on Exhibit 6-1.

6.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes General Plan Buildout Without Project volumes plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for General Plan Buildout With Project traffic conditions are shown on Exhibit 6-2.

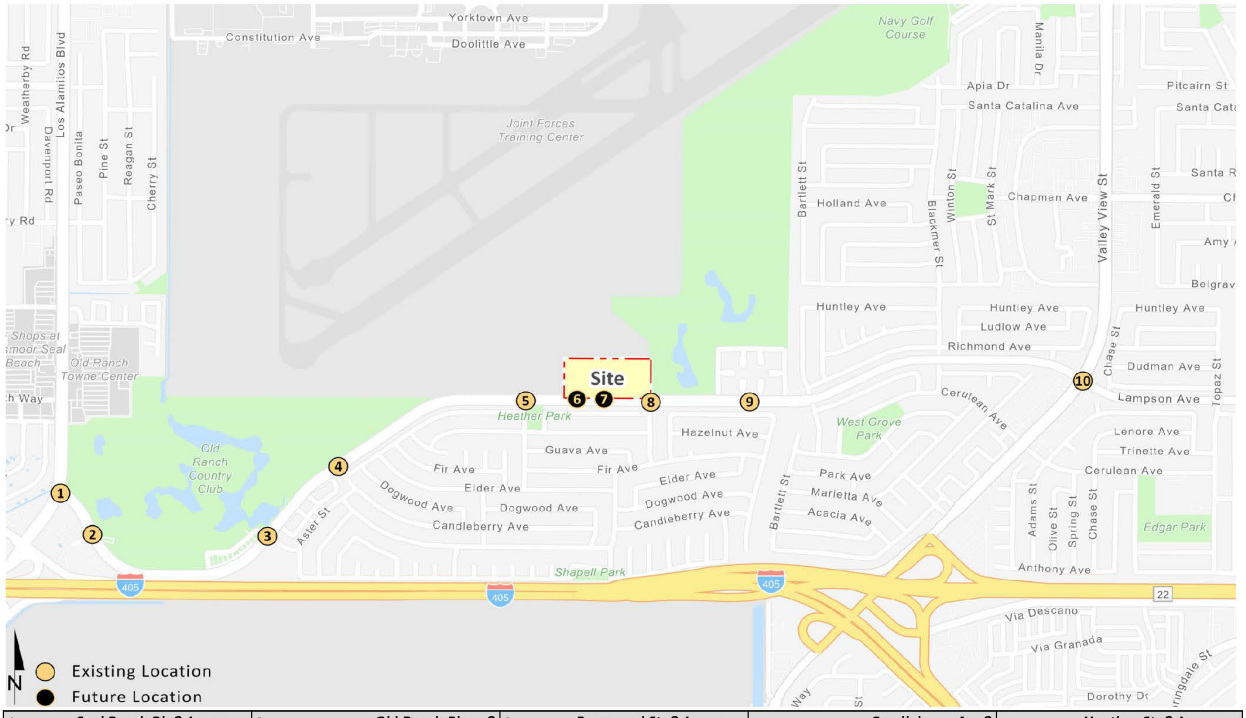
6.4 INTERSECTION OPERATIONS ANALYSIS

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 following study area intersection is anticipated to continue to operate at an unacceptable LOS during the peak hours under General Plan Buildout Without Project traffic conditions:

- Seal Beach Bl. & Lampson Av. (#1) – LOS F AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for General Plan Buildout Without Project traffic conditions. However, the addition of Project traffic is anticipated to increase the v/c ratio by more than 0.01 at the intersection of Seal Beach Boulevard and Lampson Avenue. As such, improvements are provided for the deficient intersections.

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



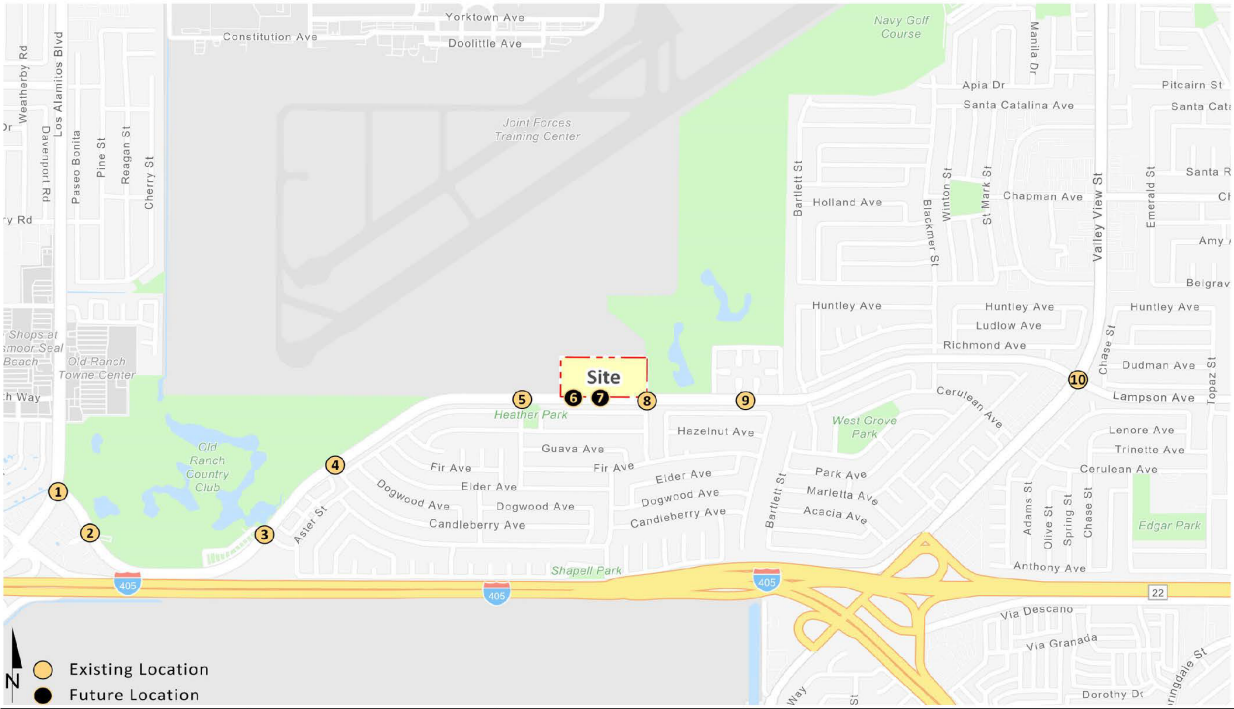
1 Seal Beach Bl. & Lampson Av.			2 Old Ranch Plaza & Lampson Av.			3 Basswood St. & Lampson Av.			4 Candleberry Av. & Lampson Av.			5 Heather St. & Lampson Av.		
48,550		22,350	850		20,000	900		16,000			14,150			14,450
	1591(1504) ↓	↰ 711(595)		34(20) ↲	↰ 5(6)		8(43) ↲	↰ 7(3)			← 684(635)			← 613(607)
	689(571) ↳	↰ 440(488)		0(1) ↓	← 1032(875)		0(3) ↓	← 862(699)			↰ 23(31)			↰ 39(78)
		→		6(3) ↳	↰ → ↱		1(5) ↳	↰ → ↱			↰ ↱			↰ ↱
	1479(1893) →	426(532) ↱	18(38) →	732(976) →	33(48) 3(0) 8(11)	21(30) →	542(769) →	233(141) 1(0) 3(11)	459(659) →	88(127) ↴	195(80) 39(26)	427(616) →	71(68) ↴	95(59) 69(57)
		46,500	36(39) ↴		1,150	90(132) ↴		3,200			2,800			2,800
			21,350			19,350			16,000			14,350		

6 Driveway 1 & Lampson Av.			7 Driveway 2 & Lampson Av.			8 Rose St. & Lampson Av.			9 Tulip St. & Lampson Av.			10 Valley View St. & Lampson Av.		
		14,250			14,250			15,000	550		16,200	50,750		12,700
		← 657(648)			← 657(648)			← 615(616)		16(13) ↲	← 10(21)		207(258) ↲	← 267(135)
								↰ 34(78)		1(0) ↓	← 588(651)		1844(2029) ↓	← 373(248)
								↰ ↱		13(11) ↳	↰ 41(91)		136(198) ↳	↰ 311(235)
	485(692) →		485(692) →			458(654) →	42(32)	58(63)	6(8) →		↰ ↑ ↱	216(280) →		180(244) ↑ 205(177)
						27(38) ↴			497(678) →	44(31)	1(0) 89(73)	279(315) →	180(244)	
									13(31) ↴			171(152) ↴		
14,250			14,250			14,250		2,250	15,000		2,400	15,700		49,650

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

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



1 Seal Beach Bl. & Lampson Av.			2 Old Ranch Plaza & Lampson Av.			3 Basswood St. & Lampson Av.			4 Candleberry Av. & Lampson Av.			5 Heather St. & Lampson Av.		
48,900		23,300	850		20,900	900		16,900			15,100			15,350
↓ 1591(1504)	↳ 695(589)	↰ 728(606)	↲ 34(20)	↓ 0(1)	↳ 6(3)	↲ 8(43)	↓ 0(3)	↳ 1(5)			← 730(666)			← 659(638)
		← 469(508)			← 1078(906)			← 907(730)			↰ 23(31)			↰ 39(78)
		↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱
		1479(1893) → 436(564) ↴			18(38) → 748(1026) → 36(39) ↴			21(30) → 558(819) → 90(132) ↴			475(709) → 88(127) ↴			443(666) → 71(68) ↴
		47,050			33(48) 3(0) 8(11)			233(141) 1(0) 3(11)			195(80) 39(26)			95(59) 69(57)
			22,250		1,150	20,250		3,200	16,900		2,800	15,300		2,800

6 Driveway 1 & Lampson Av.			7 Driveway 2 & Lampson Av.			8 Rose St. & Lampson Av.			9 Tulip St. & Lampson Av.			10 Valley View St. & Lampson Av.		
400		15,150	1,250		15,000			15,750	550		16,950	50,900		12,950
	↲ 21(14)	← 7(23)		↲ 25(17)	↳ 37(25)			← 628(657)		↲ 16(13)	↓ 1(0)	↳ 13(11)	↲ 210(267)	↓ 1844(2029)	↳ 136(198)	← 267(135)
		← 682(665)			← 6(18)			↰ 34(78)			← 10(21)			← 377(262)
					← 664(671)						← 601(692)			↰ 311(235)
		↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱			↰ ↑ ↱
		501(742) → ↴			16(50) → 485(692) → ↴			495(679) → 27(38) ↴			6(8) → 534(703) → 13(31) ↴			224(286) → 291(323) → 188(163) ↴
		15,150			15,150			42(32) 58(63)			44(31) 1(0) 89(73)			186(262) 186(262) 205(177)
						15,000		2,250	15,750		2,400	16,450		50,000

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

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

#	Intersection	Traffic Control[2]	GPBO Without Project Delay (secs.) or ICU (v/c)[1] AM	GPBO Without Project Delay (secs.) or ICU (v/c)[1] PM	GPBO Without Project Level of Service AM	GPBO Without Project Level of Service PM	GPBO With Project Delay (secs.) or ICU (v/c)[1] AM	GPBO With Project Delay (secs.) or ICU (v/c)[1] PM	GPBO With Project Level of Service AM	GPBO With Project Level of Service PM
1	Seal Beach Bl. & Lampson Av.	TS	**1.02**	**1.00**	**F**	**F**	**1.04**	**1.01**	**F**	**F**
2	Old Ranch Plaza & Lampson Av.	TS	0.48	0.44	A	A	0.50	0.45	A	A
3	Basswood St. & Lampson Av.	TS	0.54	0.43	A	A	0.55	0.53	A	A
4	Candleberry Av. & Lampson Av.	TS	0.45	0.43	A	A	0.46	0.45	A	A
5	Heather St. & Lampson Av.	TS	0.38	0.43	A	A	0.40	0.45	A	A
6	Driveway 1 & Lampson Av.	**CSS**	Future Intersection				11.0	10.9	B	B
7	Driveway 2 & Lampson Av.	**CSS**	Future Intersection				15.3	16.1	C	C
8	Rose St. & Lampson Av.	TS	0.34	0.42	A	A	0.34	0.43	A	A
9	Tulip St. & Lampson Av.	TS	0.35	0.43	A	A	0.36	0.44	A	A
10	Valley View St. & Lampson Av.	TS	**0.91**	**0.95**	**E**	**E**	**0.92**	**0.96**	**E**	**E**
	HCM Analysis:		52.3	49.8	D	D	54.0	52.4	D	D

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

[1] Per the Highway Capacity Manual (6th 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.

ICU is reported in volume-to-capacity (v/c). ICU analysis conducted for signalized intersections only.

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

Although the intersection of Valley View Street at Lampson Avenue is anticipated to operate at a deficient LOS based on the ICU methodology, a more detailed peak hour intersection operations assessment based on the HCM methodology indicates acceptable peak hour operations. As such, no intersection improvements have been recommended at the intersection of Valley View Street and Lampson Avenue. The intersection operations analysis worksheets for General Plan Buildout Without and With Project traffic conditions are included in Appendix 6.1 and Appendix 6.2 of this TA, respectively.

The intersection of Driveway 2 and Lampson Avenue is anticipated to operate at an acceptable LOS as a cross-street stop. However, the City Engineer should determine whether other applicable warrants would require the installation of a traffic signal at Driveway 2. If a traffic signal is installed, then it should be coordinated with other signals along Lampson Avenue to accommodate optimal vehicle progression.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

All existing study area intersections are currently signalized. As such, no traffic signal warrant analysis has been conducted for General Plan Buildout Without Project traffic conditions. The intersection of Driveway 2 at Lampson Avenue is not anticipated to warrant a peak hour or planning-level (ADT) based warrant under General Plan Buildout With Project traffic conditions. The traffic signal warrant analysis

worksheets for General Plan Buildout With Project traffic conditions are included in Appendix 6.3 of this TA.

6.6 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of deficiencies and recommended improvements for General Plan Buildout traffic conditions. Based on deficiency criteria discussed in Section 2.5 *Deficiency Criteria*, the following intersection was found to be deficient. Improvements necessary to improve this traffic deficiency back to acceptable levels is discussed below.

Seal Beach Boulevard & Lampson Avenue (#1): the same improvements as those identified previously for Opening Year Cumulative traffic conditions would improve the intersection operations back to acceptable LOS.

The intersection operations analysis worksheets for General Plan Buildout With Project traffic conditions, with improvements, are included in Appendix 6.4 of this TA.

TABLE 6-2: INTERSECTION ANALYSIS FOR GENERAL PLAN BUILDOUT CONDITIONS WITH IMPROVEMENTS

			Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Seal Beach Bl. & Lampson Av.																	
	- Without Improvements	TS	0	3	1>	2	3	0	0	0	0	2	0	1>	**1.04**	**1.01**	**F**	**F**
	- With Improvements[4]	TS	0	3	1>	2	3	0	0	0	0	**1**	**1**	1>	0.86	0.89	D	D

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the Highway Capacity Manual 6th 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.

[3] TS = Traffic Signal

[4] Improvement includes restriping the number 2 westbound left as a shared left-right turn lane.

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7 FAIR SHARE CALCULATIONS

Transportation improvements are funded through a combination of improvements constructed by the Project or fair share contributions. When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, have been provided in Table 7-1 for the applicable deficient study area intersections. Fair share contributions are collected with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

TABLE 7-1: PROJECT FAIR SHARE CALCULATIONS

#	Intersection		Existing 2022	Project Only	GPBO With Project	Total New Traffic	Project % of New Traffic
1	Seal Beach Bl. & Lampson Av.						
		AM:	3,985	62	5,398	1,413	4.4%
		PM:	4,339	81	5,664	1,325	**6.1%**

BOLD = Highest fair share percentage is highlighted.

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8 REFERENCES

1. **City of Seal Beach - Public Works.** Transportation Analysis Guidelines. City of Seal Beach : s.n., June 2020.
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3. **City of Los Alamitos.** City of Los Alamitos General Plan. City of Los Alamitos : s.n., March 2015.
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5. **Orange County Transportation Authority.** 2021 Orange County Congestion Management Program Report. County of Orange : OCTA, November 2021.
6. **Transportation Research Board.** Highway Capacity Manual (HCM). 6th Edition. s.l. : National Academy of Sciences, 2016.
7. **Caltrans.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. California Manual on Uniform Traffic Control Devices (CAMUTCD). 2014.

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