

REVISED TRAFFIC CIRCULATION ANALYSIS
CABRILLO TOWN CENTER MIXED-USE PROJECT

Santa Ana, California
November 18, 2022

Prepared for:

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REVISED TRAFFIC CIRCULATION ANALYSIS
CABRILLO TOWN CENTER MIXED-USE PROJECT

Santa Ana, California
November 18, 2022

1.0 INTRODUCTION

This Traffic Circulation Analysis report addresses the potential traffic impacts and circulation needs associated with Cabrillo Town Center Mixed-Use Project (hereinafter referred to as Project) in the City of Santa Ana. The Project site is a 8.97±-acre rectangular-shaped parcel of land within the Metro East Mixed Use (MEMU) Overlay Zone that is generally located north of Fourth Street and east of Cabrillo Park Drive in the City of Santa Ana, California. The subject property is currently developed with four (4) three-story office buildings with a total floor area of 173,025 square-feet (SF) of floor area and approximately 617 surface parking spaces.

1.1 Scope of Work

This traffic report documents the findings and recommendations of a traffic analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the need for potential Project-related circulation improvements. The traffic analysis evaluates the existing operating conditions at twenty-five (25) key study intersections and project driveways within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future near-term (Year 2026) and long-term (Year 2045) operating conditions without and with the proposed Project. Where necessary, intersection improvements are identified.

The scope of work for this traffic analysis was developed in collaboration with City of Santa Ana Public Works Agency – Traffic Engineering staff and in consideration of *Mitigation Measure (MM) -OZ 4.12-2 and MM-OZ 4.12-4 of the Mitigation Monitoring and Reporting Program (MMRP) for the Metro East Mixed-Use (MEMU) Overlay District Expansion and Elan Development Projects (August 2018)*. This traffic report satisfies the traffic requirements of the City of Santa Ana. **Appendix A** presents the scope of work that was developed in conjunction with and reflects input City of Santa Ana Public Works Department staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing weekday peak hour traffic count information has been collected at twenty-five (25) key study intersections for use in the preparation of intersection level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Santa Ana, City of Tustin and City of Orange. Based on our research, there are twenty-eight (28) related projects located in the City of Santa Ana, eight (8) related projects located in the City of Tustin and one (1) related project located in the City of Orange. The thirty-seven (37) related projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour traffic conditions for a near-term (Year 2026) and long-term (Year 2045) traffic setting upon completion of the proposed Project. Near-term (Year 2026) cumulative daily and peak hour traffic forecasts were projected by incorporating a one percent (1.0%) annual growth rate and the trip generation potential of thirty-seven (37) related projects. Long-term (Year 2045) daily and peak hour traffic forecasts were projected based on modeled traffic projections prepared by OCTA utilizing the OCTAM 5.0 Year 2045 Model.

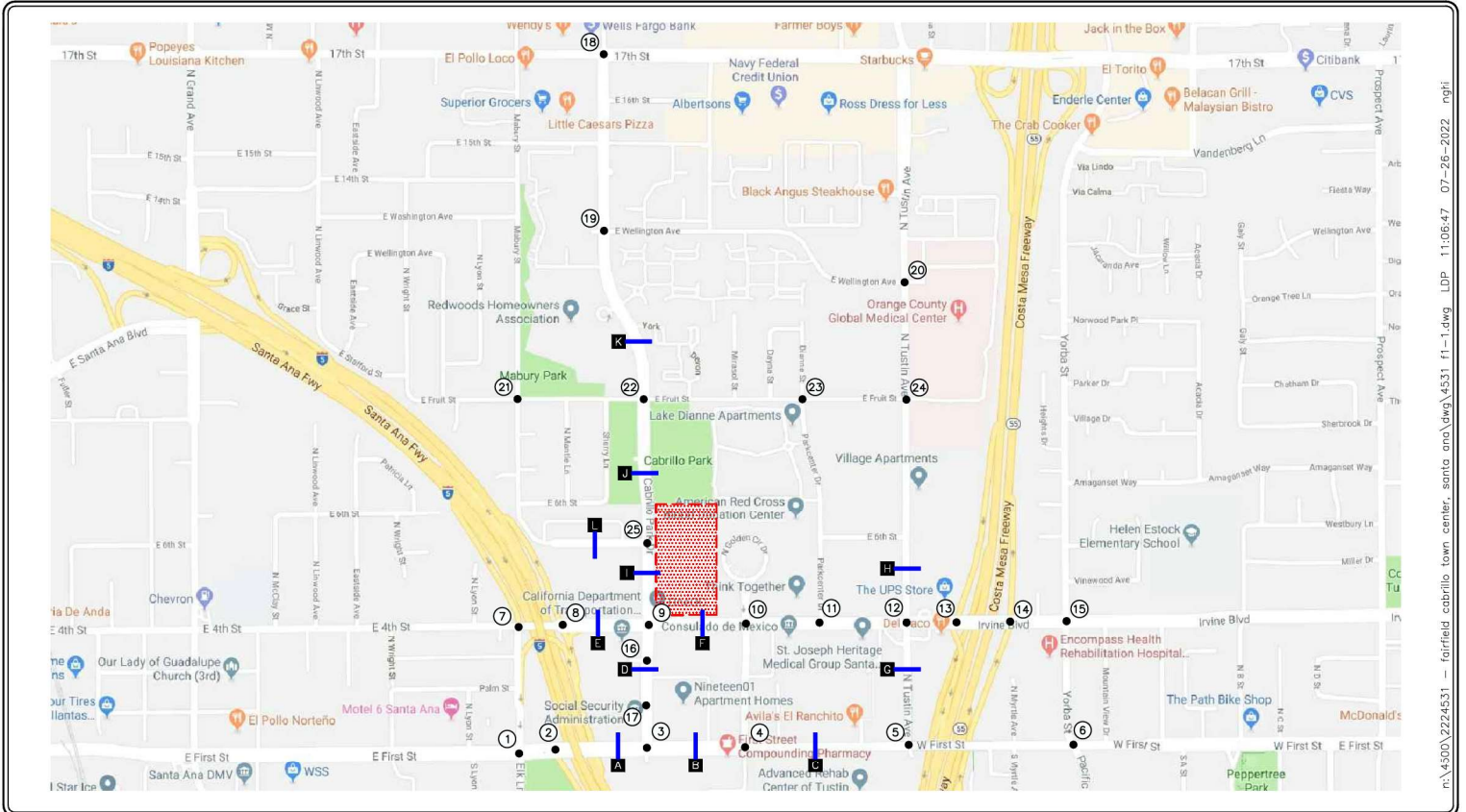
1.2 Study Area

The twenty-five (25) intersections listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic impact investigation.

Key Study Intersections

- | | |
|--|---|
| 1. Elk Lane at First Street (Santa Ana) | 14. SR-55 NB Ramps at 4 th Street (Tustin/Caltrans) |
| 2. I-5 SB On-Ramp at First Street (Santa Ana/Caltrans) | 15. Yorba Street at 4 th Street (Tustin) |
| 3. Cabrillo Park Drive at First Street (Santa Ana) | 16. Cabrillo Park Drive at State Fund Access Road (Santa Ana) |
| 4. Golden Circle Drive at First Street (Santa Ana) | 17. Cabrillo Park Drive at Xerox Center Access Road (Santa Ana) |
| 5. Tustin Avenue at First Street (Tustin) | 18. Cabrillo Park Drive at 17 th Street (Santa Ana) |
| 6. Yorba Street at First Street (Tustin) | 19. Cabrillo Park Drive at Wellington Avenue (Santa Ana) |
| 7. I-5 SB On-Ramp/Mabury Street at 4 th Street (Santa Ana/Caltrans) | 20. Tustin Avenue at Wellington Avenue (Santa Ana) |
| 8. I-5 NB Ramps at 4 th Street (Santa Ana/Caltrans) | 21. Mabury Street at Fruit Street (Santa Ana) |
| 9. Cabrillo Park Drive at 4 th Street (Santa Ana) | 22. Cabrillo Park Drive at Fruit Street (Santa Ana) |
| 10. Golden Circle Drive at 4 th Street (Santa Ana) | 23. Park Center Drive at Fruit Street (Santa Ana) |
| 11. Park Center Drive at 4 th Street (Santa Ana) | 24. Tustin Avenue at Fruit Street (Santa Ana) |
| 12. Tustin Avenue at 4 th Street (Santa Ana) | 25. Cabrillo Park Drive at Park Court Place (Santa Ana) |
| 13. SR-55 SB Ramps at 4 th Street (Santa Ana/Caltrans) | |

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service.



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NO SCALE

SOURCE: GOOGLE

KEY

- = STUDY INTERSECTION
- = ROADWAY SEGMENT
- = PROJECT SITE

FIGURE 1-1

VICINITY MAP

CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- AM and PM peak hour capacity analyses for existing conditions,
- AM and PM peak hour capacity analyses for existing plus project conditions,
- AM and PM peak hour capacity analyses for future near-term (Year 2026) traffic conditions without and with the proposed Project,
- AM and PM peak hour capacity analyses for future long-term (Year 2045) traffic conditions without and with the proposed Project,
- Caltrans Analysis,
- Site Access Evaluation,
- Queueing Analysis,
- Internal Circulation and Sight Distance Evaluation, and
- Recommended Intersection Improvements.

2.0 PROJECT DESCRIPTION

The Project site is a 8.97±-acre rectangular-shaped parcel of land within the Metro East Mixed Use (MEMU) Overlay Zone that is generally located north of Fourth Street and east of Cabrillo Park Drive in the City of Santa Ana, California. The Project site has an existing zoning of Professional (P) and is identified with a “Village Center District” designation in the MEMU Overlay Zone. The subject property is currently developed with four (4) three-story office buildings with a total floor area of 173,025 square-feet (SF) of floor area and approximately 617 surface parking spaces. The northern half of the Project site, addressed at 515 – 525 Cabrillo Park Drive, is developed with two (2) three-story office buildings with a total floor area of 92,115 SF, whereas the southern half, addressed at 1907 – 1971 E. Fourth Street, is developed with two (2) three-story office buildings with a total floor area of 80,910 SF. Vehicular access to the Project site is currently provided via two (2) right-turn only driveways on Fourth Street, one (1) right-turn only driveway on Cabrillo Park Drive, and a full access driveway located opposite Park Court Place at Cabrillo Park Drive; No cross vehicular access is now provided with the adjacent commercial property to the east. See **Figure 1-1**, a Vicinity Map that illustrates the general location of the Project and surrounding street system. **Figure 2-1** is an existing aerial photograph of the Project site.

The proposed Project will include the development of up to 507 residential apartment/townhomes units with a total of 1,025 parking spaces. Site “A” is proposed as five-story apartment podium with up 449 apartment homes consisting of 23 studio units, 264 one-bedroom units, 148 two-bedroom units, and 14 two-bedroom/live-work units, and 5,800 square-feet (SF) of ground floor retail space and 11,400 SF of live/work commercial/office space (estimated at 814 SF per live-work unit) “wrapped” around a six-level parking structure with a total of roughly 898 parking spaces. On-site facilities/amenities for residents of Site “A” include 6,100 SF of commercial space that would be dedicated to the leasing office, mailroom and co-work space and business center, lobby/lounge, pool/spa, and a fitness center for residents, and courtyards. Site “B” is proposed as residential townhome community consisting of three-story townhomes with a total of 58 units and parking supply of 127 spaces consisting of garage spaces and surface parking. On-site facilities/amenities of the Site “B” includes open space/courtyards. Although not counted as a part of the Project’s parking supply, an additional 23 on-street parking spaces will be provided on Park Court Place.

Table 2-1 provides a summary of the proposed Project components. **Figure 2-2** presents the proposed Site Plan, prepared by AO Architects, dated 11/10/2022. It should be noted that the northeast curb at Cabrillo Park Drive and Fourth Street has been modified to allow for southbound U-turn movements. Further, the proposed Site Plan illustrates the implications of the construction of a westbound right-turn lane on Fourth Street at Cabrillo Park Drive, which is identified as a recommended improvements in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

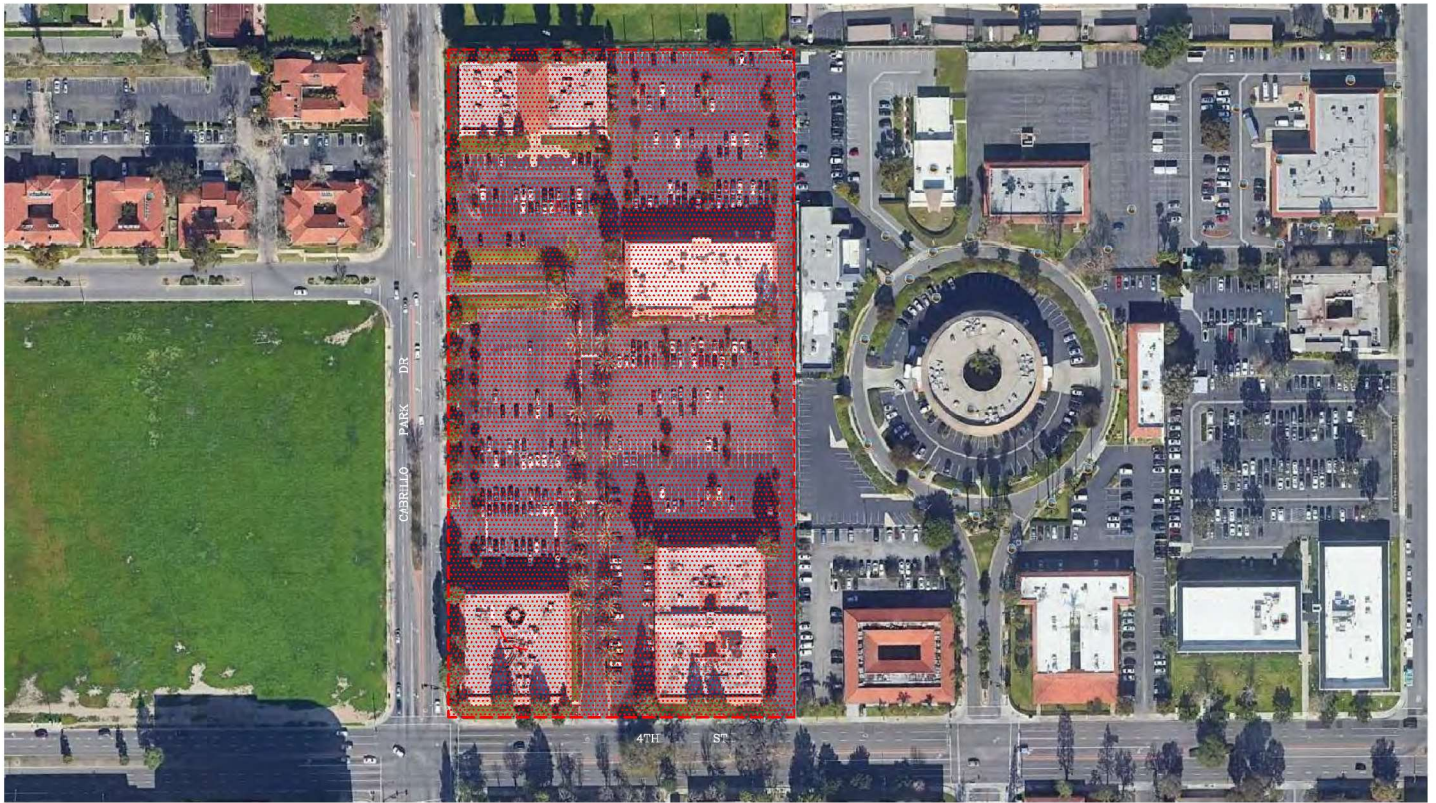
The Project is expected to be constructed and completed by Year 2026, which has been utilized to assess the Project’s potential traffic impacts at full occupancy of the project within an opening year traffic setting.

2.1 Site Access

Vehicular access to Site A's parking structures will be provided from a proposed "right-turn in/right-turn out" driveway on Cabrillo Park Drive (Driveway 1) and a proposed "right-turn in/right-turn out" driveway on Fourth Street (Driveway 2), whereas access to Site B will be provided via a "full access" driveway located opposite Park Court Place at Cabrillo Park; No cross vehicular access is proposed between the two Project sites or with the adjacent commercial property to the east.

2.2 Pedestrian Circulation

Pedestrian circulation for the proposed Project would be provided via existing public sidewalks along Park Court Place, Cabrillo Park Drive, and 4th Street within the vicinity of the Project. The existing sidewalk system within the Project vicinity provides direct connectivity to the existing development located along major thoroughfares.



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SOURCE: GOOGLE

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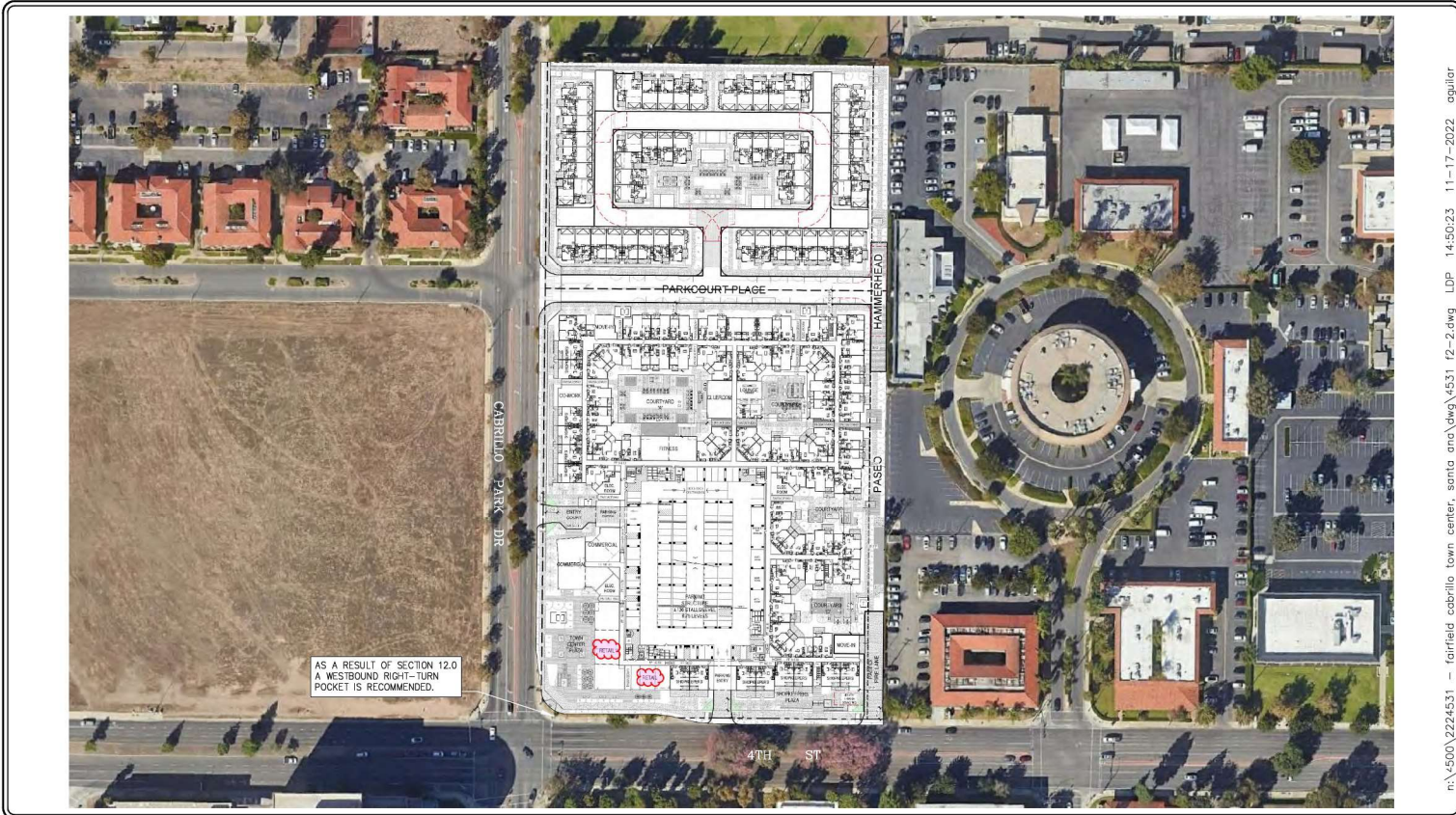
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FIGURE 2-1

EXISTING AERIAL SITE PLAN

CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



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SOURCE: ARCHITECTS ORANGE

FIGURE 2-2

PROPOSED SITE PLAN

CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



NO SCALE

TABLE 2-1
PROJECT DEVELOPMENT SUMMARY

Land Use / Project Description	Project Development Totals
<u>Cabrillo Town Center Mixed Use</u>	
<input type="checkbox"/> Site A: 5-Story Wrap <ul style="list-style-type: none"> ○ Studio Units (600 SF) ○ 1 Bedroom Units (750 SF) ○ 2 Bedroom Units (1,070 SF) ○ Live-Work / 2 Bedroom Units (1,200 SF) <p style="text-align: right;">Total Apartment Units:</p>	<p>23 Units (5.1%)</p> <p>264 Units (58.8%)</p> <p>148 Units (33.0%)</p> <p><u>14 Units (3.1%)</u></p> <p>449 Units</p>
<input type="checkbox"/> Site A: Commercial <ul style="list-style-type: none"> ○ Retail ○ Live/Work Commercial <p style="text-align: right;">Total Commercial Space:</p>	<p>5,800 SF</p> <p><u>11,400 SF</u></p> <p>17,200 SF</p>
<input type="checkbox"/> Site B: 3-Story Townhomes <ul style="list-style-type: none"> ○ Total Residential Units: 	<p>58 units</p> <p>507 Units</p>
<u>Parking Supply</u>	
<input type="checkbox"/> Site A – Parking Structure <ul style="list-style-type: none"> ○ Resident Parking ○ Retail/Commercial/Guest Parking <p style="text-align: right;">Site A Parking Supply:</p>	<p>808 spaces</p> <p><u>90 spaces</u></p> <p>898 spaces</p>
<input type="checkbox"/> Site B <ul style="list-style-type: none"> ○ Resident - two-car Garage per unit ○ Resident/Guest – Open Parking <p style="text-align: right;">Site B Parking Supply:</p>	<p>116 spaces</p> <p><u>11 spaces</u></p> <p>127 spaces</p>
Total Parking Supply:	1,025 spaces

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The principal local network of streets serving the project site is First Street, 4th Street, 17th Street, Park Court Place, Cabrillo Park Drive, and Tustin Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

First Street a four to six-lane, divided roadway in the vicinity of the project, oriented in the east-west direction that provides two or three lanes in each direction separated by a raised median island. The posted speed limit on First Street is 35 mph. On-street parking is not permitted along this roadway. A traffic signal controls the study intersections of First Street at Mabury Street/Elk Lane, I-5 SB On Ramp, Cabrillo Park Drive, Golden Center Drive, Tustin Avenue, and Yorba Street.

4th Street is a six-lane, divided roadway oriented in the east-west direction that provides three eastbound and three westbound travel lanes separated by a raised median island. The posted speed limit on Fourth Street is 40 miles per hour (mph). On-street parking is not permitted along this roadway in the vicinity of the project. Traffic signals control the study intersections of Fourth Street at I-5 SB Off-Ramp, I-5 NB On-Ramp, Cabrillo Park Drive, Golden Circle Drive, Park Center Drive, Tustin Avenue, SR-55 SB Ramps, SR-55 NB Ramps and Yorba Street. East of the SR-55 Freeway, Fourth Street is known as Irvine Boulevard within the City of Tustin.

17th Street is a six-lane, divided roadway oriented in the east-west direction. The posted speed limit on 17th Street is 40 mph. On-street parking is not permitted on either side of this roadway in the vicinity of the Project. A traffic signal controls the study intersection of 17th Street at Cabrillo Park Drive.

Park Court Place is a two-lane, divided roadway oriented in the east-west direction. The posted speed limit on Park Court Place is 25 mph. On-street parking is not permitted on either side of this roadway in the vicinity of the Project.

Cabrillo Park Drive is a four-lane, divided roadway that borders the project site to the east, oriented in the north-south direction. The posted speed limit on Cabrillo Park Drive is 35 mph. On-street parking is not permitted along this roadway in the vicinity of the project. Traffic signals control the study intersections of Fourth Street, State Fund Access Road, Xerox Centre Access Road, and First Street.

Tustin Avenue is a six-lane, divided roadway, oriented in the north-south direction. On-street parking is not permitted along this roadway in the vicinity of the project. The posted speed limit on Tustin Avenue is 40 mph. Traffic signals control the study intersections of Tustin at Fourth Street, First Street, Wellington Avenue, and Fruit Street.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.

3.1.1 Public Transit

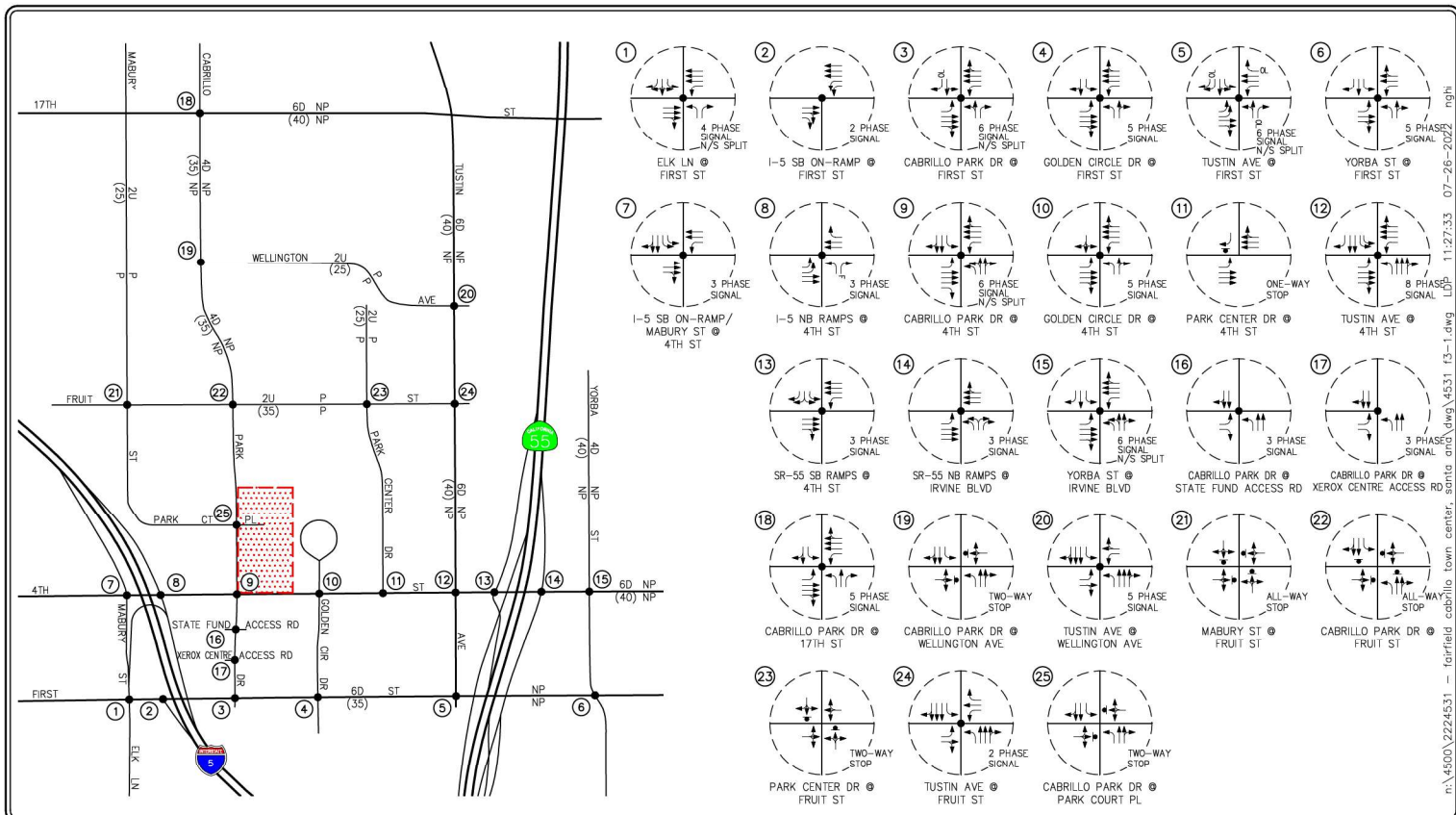
Public transit bus service is provided in the project area by the Orange County Transportation Authority (OCTA). Four (4) OCTA bus routes operate within the vicinity of the project site on First Street, 4th Street, 17th Street, and Tustin Avenue, which consists of the following:

- OCTA Route 60: The major routes of travel include 17th Street and Tustin Avenue. Nearest to the project site are bus stops located on 17th Street at Cabrillo Park Drive in the northwest and southwest corners. Route 60 operates on approximate 20-minute headways during weekdays and 15-minute headways on weekends.
- OCTA Route 64: The major route of travel is First Street. Nearest to the project site are bus stops located on First Street at Cabrillo Park Drive in the southeast and northwest corners. Route 64 operates on approximate 15-minute headways on the weekdays and 20-minutes on the weekends.
- OCTA Route 71: The major route of travel is Tustin Avenue. Nearest to the project site are bus stops located on Tustin Avenue at 4th Street in the northeast and southwest corners. Route 71 operates on approximate 50-minute headways on the weekdays and 45-minute headways on the weekends.
- OCTA Route 463: The major route of travel is 4th Street. Nearest to the project site are bus stops located on 4th Street at Cabrillo Park Drive in the northeast and southeast corners. Route 463 operates on approximate 25-minute headways on the weekdays and no bus service on the weekends.

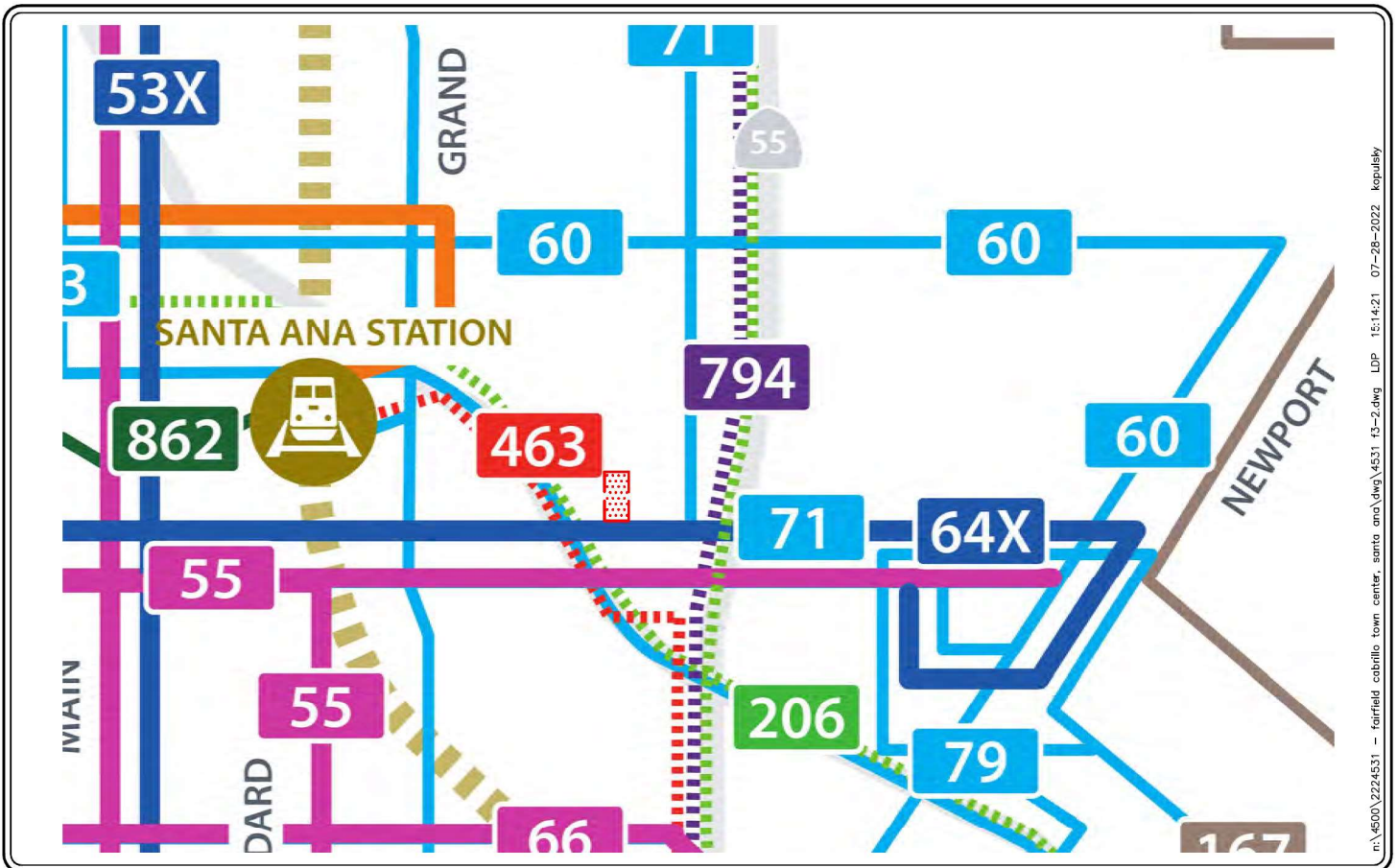
Figure 3-2 graphically illustrates the transit routes of OCTA within the vicinity of the project. *Figure 3-3* identifies the locations of the existing bus stops in proximity to the Project site.

3.2 Bicycle Master Plan

The City of Santa Ana promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bikeway Master Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. Currently, not many bicycle facilities exist in the study area. However, review of *Figure 3-4*, which presents the City's Bikeway Master Plan, shows that a Class I bike path is proposed to be built along Tustin Avenue within the vicinity of the Project.



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LINSCOTT
LAW &
GREENSPAN
engineers



SOURCE: OCTA

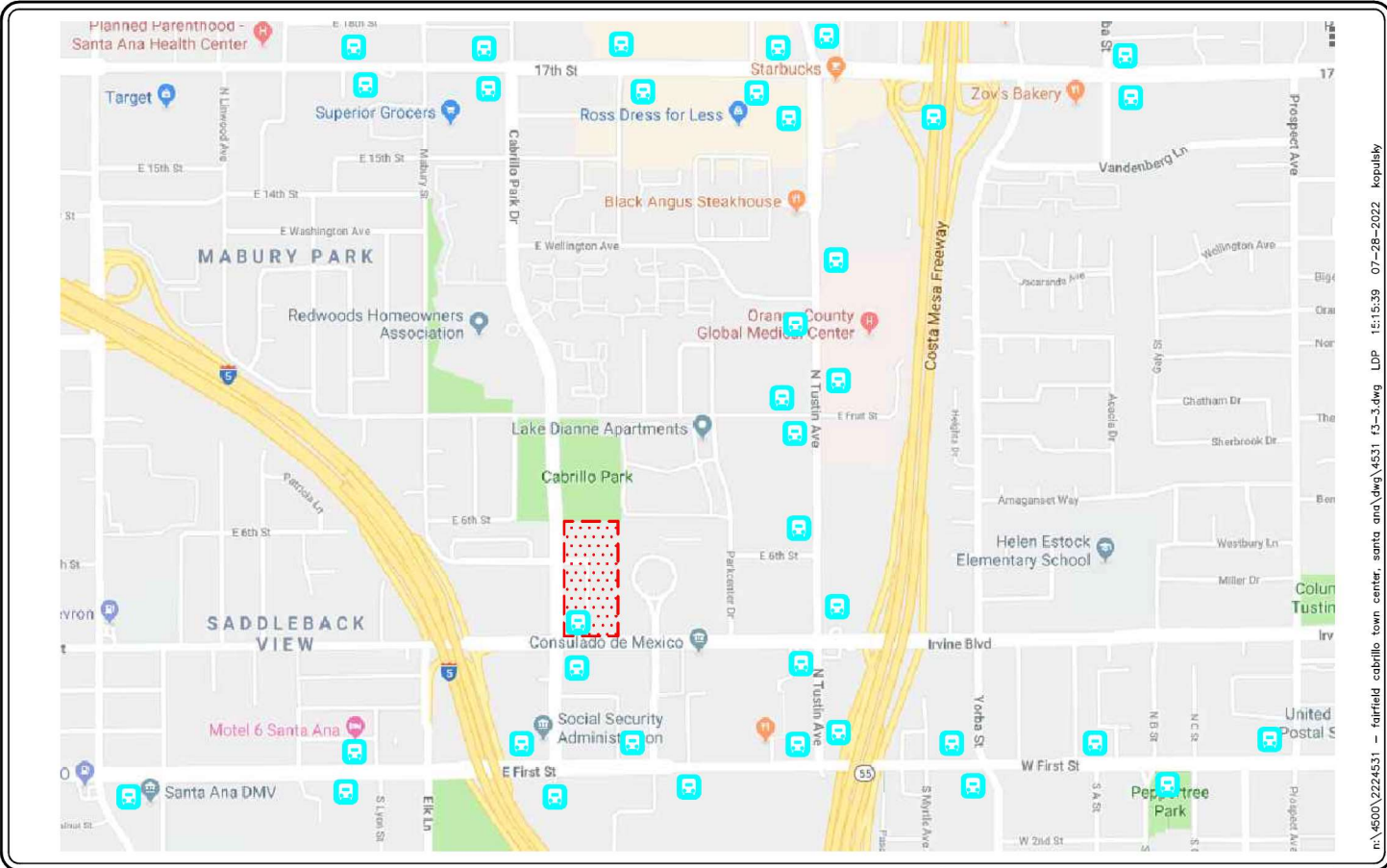
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 = PROJECT SITE

FIGURE 3-2

OCTA TRANSIT MAP

CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



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NO SCALE

SOURCE: GOOGLE

KEY

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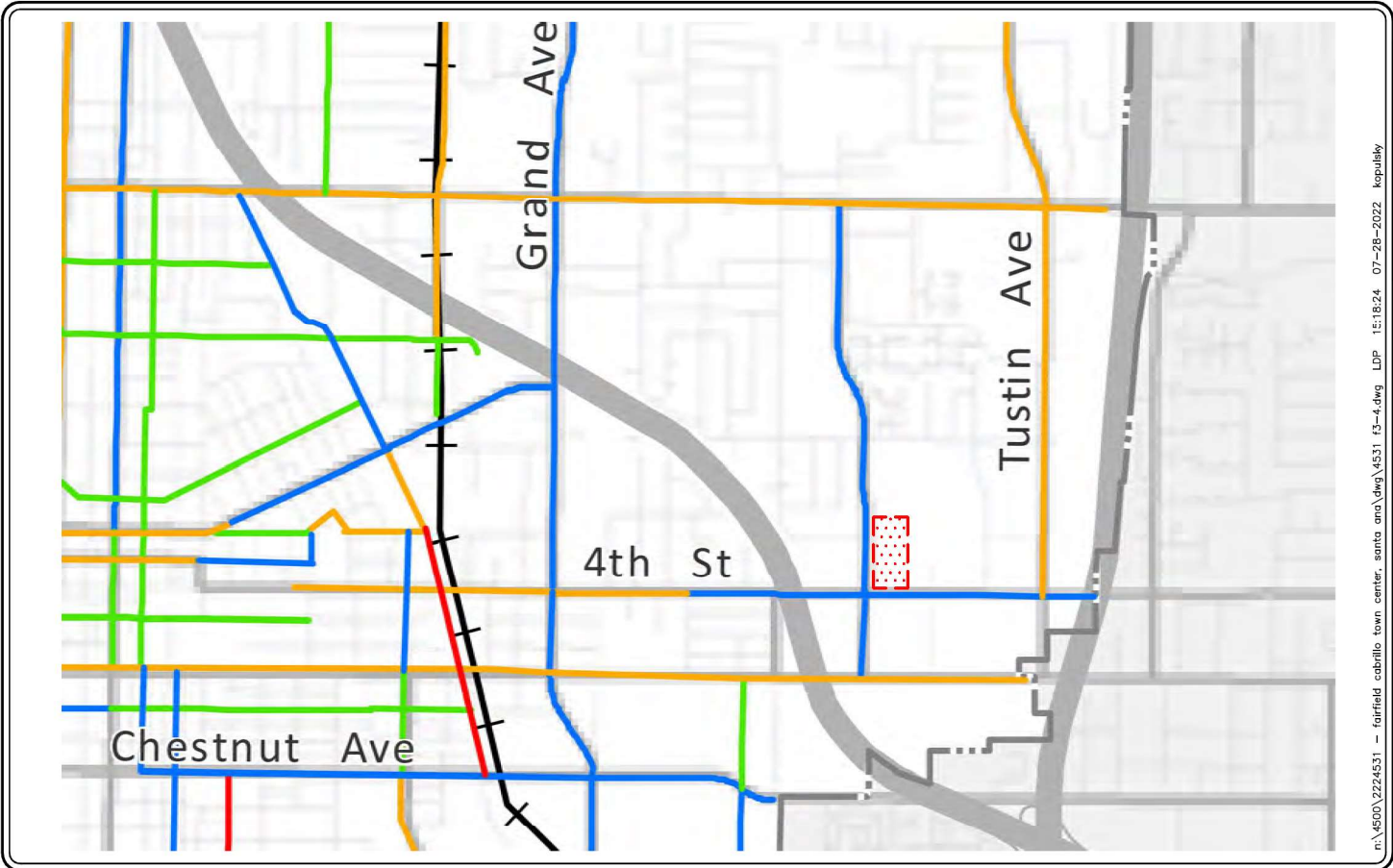
T

 = TRANSIT STOP

FIGURE 3-3

TRANSIT STOP LOCATIONS

CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



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SOURCE: CITY OF SANTA ANA GENERAL PLAN

KEY

- = PROJECT SITE
- = CLASS III BIKE ROUTE/BOULEVARD
- = CLASS I PATH
- = CLASS IV CYCLE TRACK
- = CLASS II BIKE LANE

FIGURE 3-4

CITY OF SANTA ANA BIKEWAY MASTER PLAN
CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA

3.3 Existing Traffic Volumes

Twenty-five (25) key study intersections have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections, and their analysis will reveal the potential need for Project-related circulation improvements.

Due to the COVID-19 virus, traffic patterns have changed and are significantly lower than pre-COVID-19 conditions. As such, to establish “baseline” traffic conditions, pre-COVID-19, historic Year 2019 AM and PM peak hour traffic counts were obtained at the two (2) study intersections. The historic data was grown by 0.5% per year for three years to create Year 2022 baseline conditions.

Figures 3-5 and **3-6** illustrate the existing AM and PM peak hour traffic volumes at the twenty-five (25) key study intersections evaluated in this report, respectively. **Figure 3-6** also presents the existing average daily traffic volumes for twelve (12) key roadway segments in the vicinity of the proposed Project. **Appendix B** contains the detailed peak hour and daily traffic count sheets for the key intersections and roadway segments evaluated in this report.

3.4 Existing Intersection Conditions

Existing AM and PM peak hour operating conditions for the twenty-five (25) key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the methodology outlined in the *Highway Capacity Manual 6* (HCM 6) for unsignalized intersections.

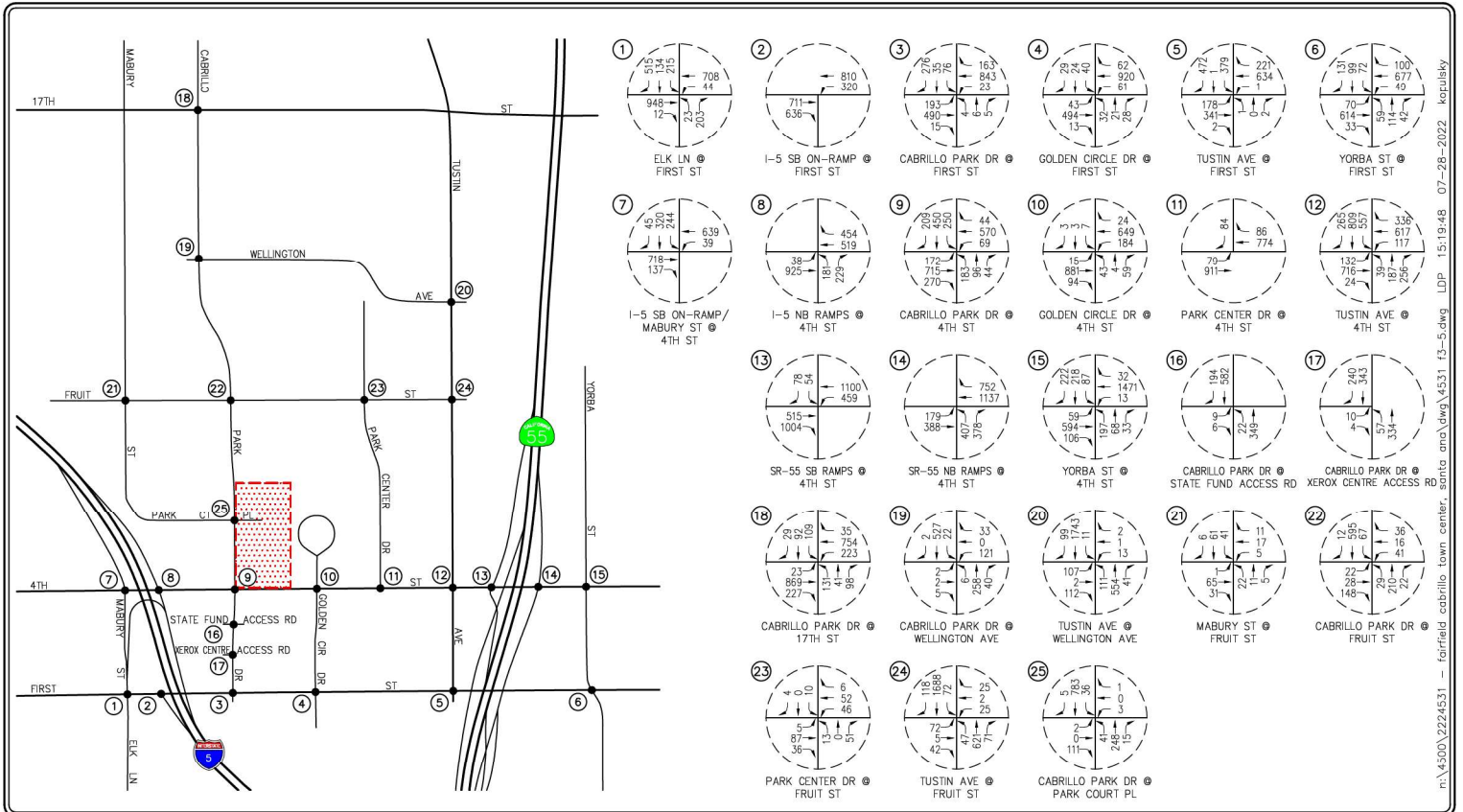
3.4.1 Intersection Capacity Utilization (ICU) Method of Analysis

In conformance with Cities of Santa Ana, Tustin and Orange County CMP requirements, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per City of Santa Ana requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through lanes and 1,600 vph for left-turn lanes and right-turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

Per City of Tustin requirements, the ICU calculations use a lane capacity of 1,700 for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning

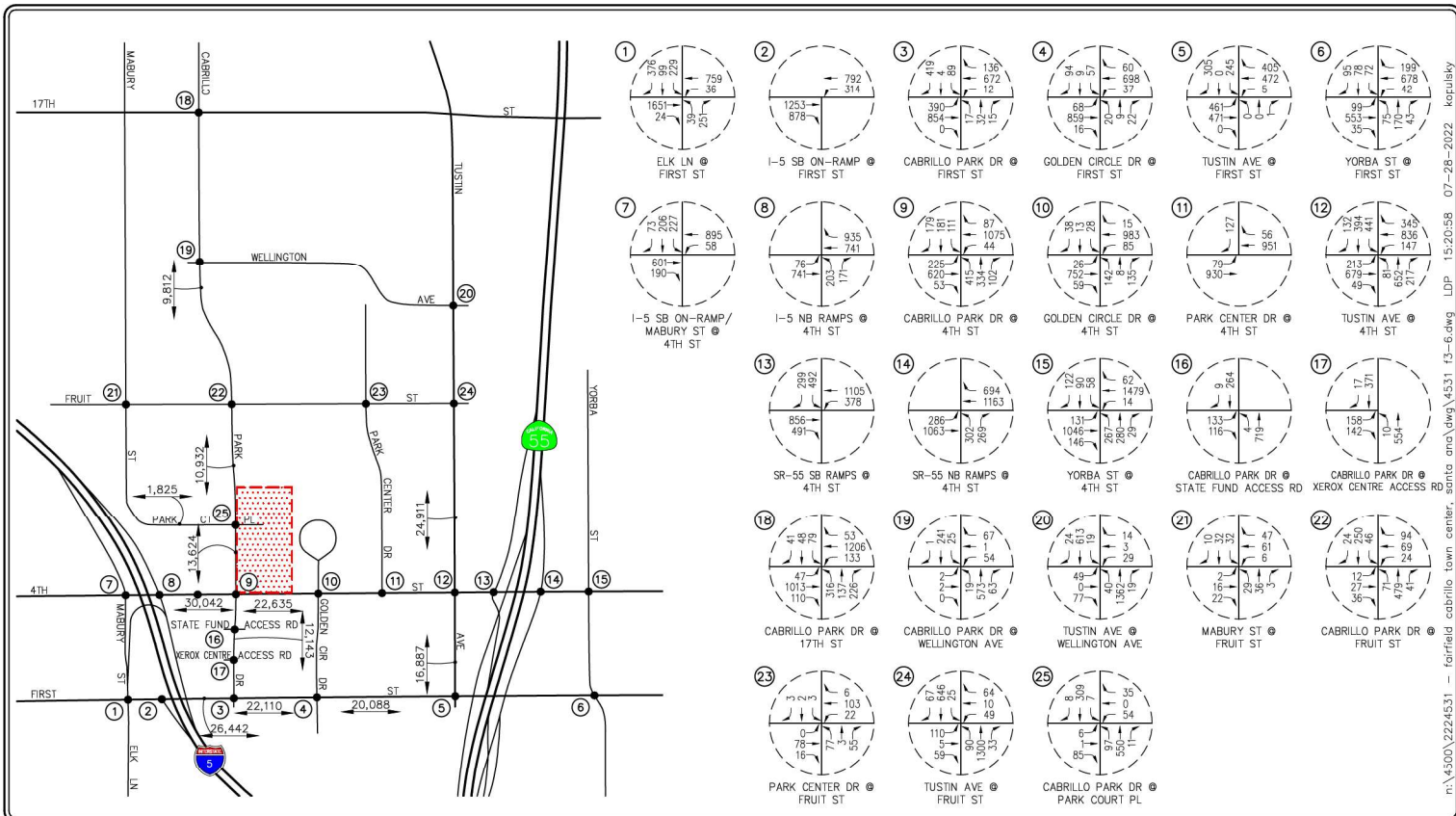


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FIGURE 3-5

EXISTING AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



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FIGURE 3-6

EXISTING PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
 CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in **Table 3-1**.

3.4.2 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections)

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in **Table 3-2**.

3.4.3 Level of Service Criteria

The need for potential Project-related improvements due to the added Project traffic volumes generated by the proposed Project during the AM and PM peak hours was evaluated using the *Intersection Capacity Utilization (ICU) Methodology* and the *Highway Capacity Manual (HCM) Methodology*. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships, delay, and service level characteristics at each key study intersection. Each key study intersection was then evaluated using the following LOS criteria. According to the City of Santa Ana, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours.

TABLE 3-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU METHODOLOGY)

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.60	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.61 – 0.70	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 – 0.80	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.81 – 0.90	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.91 – 1.00	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)¹

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

¹ Source: *Highway Capacity Manual 6*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

3.4.4 Existing Level of Service Results

Table 3-3 summarizes the existing peak hour service level calculations for the twenty-five (25) key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-3* indicates that twenty-four (24) of the twenty-five key study intersections currently operate at an acceptable level of service during the AM and PM peak hours.

Appendix D presents the ICU/LOS and HCM/LOS calculation worksheets for the twenty-five (25) key study intersections for the AM peak hour and PM peak hour.

**TABLE 3-3
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
1. Elk Lane at First Street	Santa Ana	D	4Ø Traffic Signal	AM PM	0.607 0.727	B C
2. I-5 SB On Ramp at First Street	Santa Ana/ Caltrans	Caltrans Intersection, See Section 9.0				
3. Cabrillo Park Drive at First Street	Santa Ana	D	6Ø Traffic Signal	AM PM	0.456 0.551	A A
4. Golden Circle Drive at First Street	Santa Ana	D	5Ø Traffic Signal	AM PM	0.337 0.332	A A
5. Tustin Avenue at First Street	Tustin	D	6Ø Traffic Signal	AM PM	0.351 0.374	A A
6. Yorba Street at First Street	Tustin	D	5Ø Traffic Signal	AM PM	0.404 0.484	A A
7. I-5 SB On Ramp/Mabury Street at 4 th street	Santa Ana/ Caltrans	Caltrans Intersection, See Section 9.0				
8. I-5 NB Ramps at 4 th Street	Santa Ana/ Caltrans	Caltrans Intersection, See Section 9.0				
9. Cabrillo Park Drive at 4 th Street	Santa Ana	D	6Ø Traffic Signal	AM PM	0.559 0.723	A C
10. Golden Circle Drive at 4 th Street	Santa Ana	D	5Ø Traffic Signal	AM PM	0.412 0.412	A A
11. Park Center Drive at 4 th Street	Santa Ana	D	One-Way Stop	AM PM	13.9 s/v 16.5 s/v	B C
12. Tustin Avenue at 4 th Street	Santa Ana	D	8Ø Traffic Signal	AM PM	0.609 0.748	B C
13. SR-55 SB Ramps at 4 th Street	Santa Ana/ Caltrans	Caltrans Intersection, See Section 9.0				
14. SR-55 NB Ramps at 4 th Street	Tustin/ Caltrans	Caltrans Intersection, See Section 9.0				
15. Yorba Street at 4 th Street	Tustin	D	6Ø Traffic Signal	AM PM	0.518 0.564	A A

TABLE 3-3 (CONTINUED)
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
16. Cabrillo Park Drive at State Fund Access Road	Santa Ana	D	3Ø Traffic Signal	AM PM	0.312 0.345	A A
17. Cabrillo Park Drive at Xerox Centre Access Road	Santa Ana	D	3Ø Traffic Signal	AM PM	0.274 0.312	A A
18. Cabrillo Park Drive at 17 th Street	Santa Ana	D	5Ø Traffic Signal	AM PM	0.575 0.620	A B
19. Cabrillo Park Drive at Wellington Avenue	Santa Ana	D	Two-Way Stop	AM PM	18.1 s/v 18.3 s/v	C C
20. Tustin Avenue at Wellington Avenue	Santa Ana	D	5Ø Traffic Signal	AM PM	0.583 0.416	A A
21. Mabury Street at Fruit Street	Santa Ana	D	All-Way Stop	AM PM	7.9 s/v 7.8 s/v	A A
22. Cabrillo Park Drive at Fruit Street	Santa Ana	D	All-Way Stop	AM PM	13.9 s/v 12.3 s/v	B B
23. Park Center Drive at Fruit Street	Santa Ana	D	Two-Way Stop	AM PM	10.3 s/v 10.5 s/v	B B
24. Tustin Avenue at Fruit Street	Santa Ana	D	2Ø Traffic Signal	AM PM	0.516 0.452	A A
25. Cabrillo Park Drive at Park Court Place	Santa Ana	D	Two-Way Stop	AM PM	19.0 s/v 25.1 s/v	C D

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 11th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2021].

Table 5-1, ITE Land Use 710: General Office Building, ITE Land Use 215: Single Family Attached Housing, ITE Land Use 221: Multifamily Family Housing (Mid-Rise) and ITE Land Use 822: Strip Retail Plaza trip rates will be used to forecast the trip generation potential of the Existing Land Use and proposed Project, respectively. It is noted that for this preliminary assessment, it is assumed that the commercial component of the live-work units is to be occupied by office/commercial related uses, whereas the retail component is retail/shop space.

For the Existing Land Use, a review of the middle portion of this table indicates that the existing office building generates 1,876 daily trips, with 263 trips (231 inbound, 32 outbound) produced in the AM peak hour and 249 trips (42 inbound, 207 outbound) produced in the PM peak hour on a “typical” weekday.

The lower half of *Table 5-1* indicates that the proposed Project, after application of a 5% internal capture rate, is forecast to generate 2,751 daily trips, with 213 trips (66 inbound, 147 outbound) produced in the AM peak hour and 249 trips (141 inbound, 108 outbound) produced in the PM peak hour on a “typical” weekday.

A comparison of the proposed Project’s trip generation to that of the Existing Land Use indicates that the Project will result in 875 more daily trips, 50 fewer AM peak hour trips and 0 more PM peak hour trips.

5.2 Project Traffic Distribution and Assignment

Figure 5-1 presents the traffic distribution pattern for the existing office building. **Figure 5-2** presents the traffic distribution pattern for the proposed Project. A tabular summary of the general directional Project trip distribution pattern is presented **Table 5-2**. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the project site, as well as turn restrictions at adjacent intersections,

- distribution patterns contained within the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*, and
- input from City staff.

The anticipated AM and PM peak hour project traffic volumes associated with the removal of the existing office building are presented in **Figures 5-3** and **5-4**, respectively. *Figure 5-4* also presents the daily Project traffic volumes. The traffic volume assignments presented in *Figures 5-3* and *5-4* reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-1*.

The anticipated AM and PM peak hour project traffic volumes associated with the proposed Project are presented in **Figures 5-5** and **5-6**, respectively. *Figure 5-6* also presents the daily Project traffic volumes. The traffic volume assignments presented in *Figures 5-5* and *5-6* reflect the traffic distribution characteristics shown in *Figure 5-2* and the traffic generation forecast presented in *Table 5-1*.

Figures 5-7 and **5-8** present the net trips for the AM and PM peak after combining the proposed Project with that from the trip credit applied for the existing office building. For the purpose of this study, the volumes noted in *Figures 5-7* and *5-8* are used when referring to “Plus Project” conditions.

5.3 Existing Plus Project Traffic Conditions

The Existing Plus Project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared to assess the potential impacts of the Project upon the circulation system as it currently exists per the requirements of the City, inclusive of queuing assessment to confirm adequacy of left-turn storage the study intersections. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to off-set the direct traffic impacts of the Project, if any.

Figures 5-9 and **5-10** present projected AM and PM peak hour traffic volumes at the twenty-five (25) key study intersections and Project driveways with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively. *Figure 5-10* also presents the Existing Plus Project daily traffic volumes.

TABLE 5-1
PROJECT TRAFFIC GENERATION RATES AND FORECAST²

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<i>Trip Rates:</i>							
▪ 215: Single Family Attached Housing (TE/DU)	7.20	31%	69%	0.48	57%	43%	0.57
▪ 221: Multifamily Housing – Mid-Rise (TE/DU)	4.54	23%	77%	0.37	61%	39%	0.39
▪ 710: General Office Building (TE/1000 SF)	10.84	88%	12%	1.52	17%	83%	1.44
▪ 822: Strip Retail Plaza (< 40k) (TE/1000 SF)	54.45	60%	40%	2.36	50%	50%	6.59
<i>Existing Land Use Trip Generation:</i>							
▪ Cabrillo Park Drive and E. Fourth Office Buildings (173,025 SF)	1,876	231	32	263	42	207	249
<i>Project Trip Generation:</i>							
▪ Cabrillo Town Center Apartments (449 DU)	2,038	38	128	166	107	68	175
▪ Cabrillo Town Center Retail (5,800 SF)	316	8	6	14	19	19	38
▪ Cabrillo Town Center L/W Commercial (11,400 SF)	124	15	2	17	3	13	16
▪ Cabrillo Town Center Townhomes (58 DU)	418	9	19	28	19	14	33
Total Project Trip Generation:	2,896	70	155	225	148	114	262
Internal Trip Capture (5%)	-145	-4	-8	-12	-7	-6	-13
Adjusted Project Trip Generation	2,751	66	147	213	141	108	249
Proposed Project vs. Existing Land Use Trip Generation Comparison	+875	-165	+115	-50	+99	-99	0

Notes:

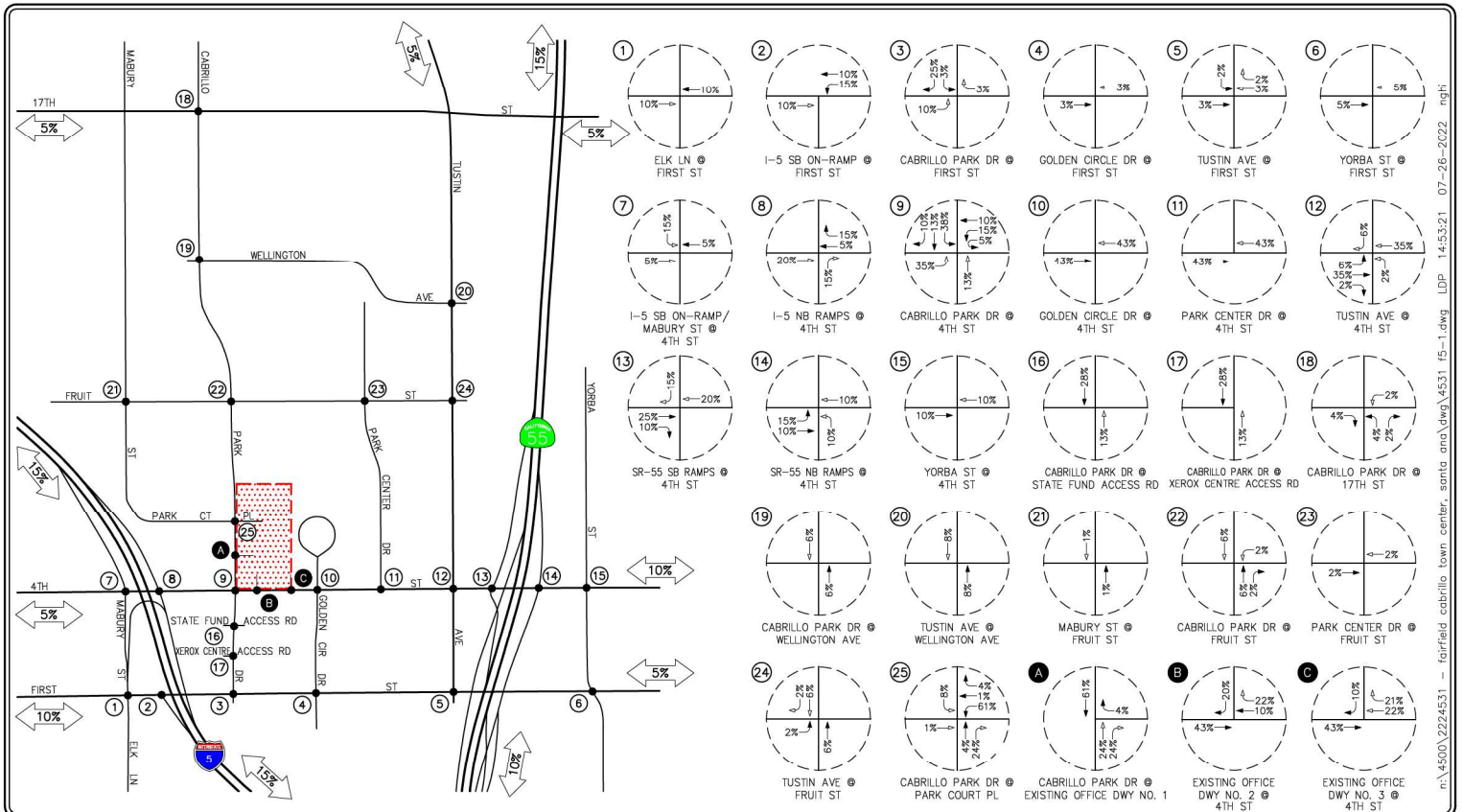
TE/1000 SF = Trip End per 1,000 Square Feet of Gross Floor Area

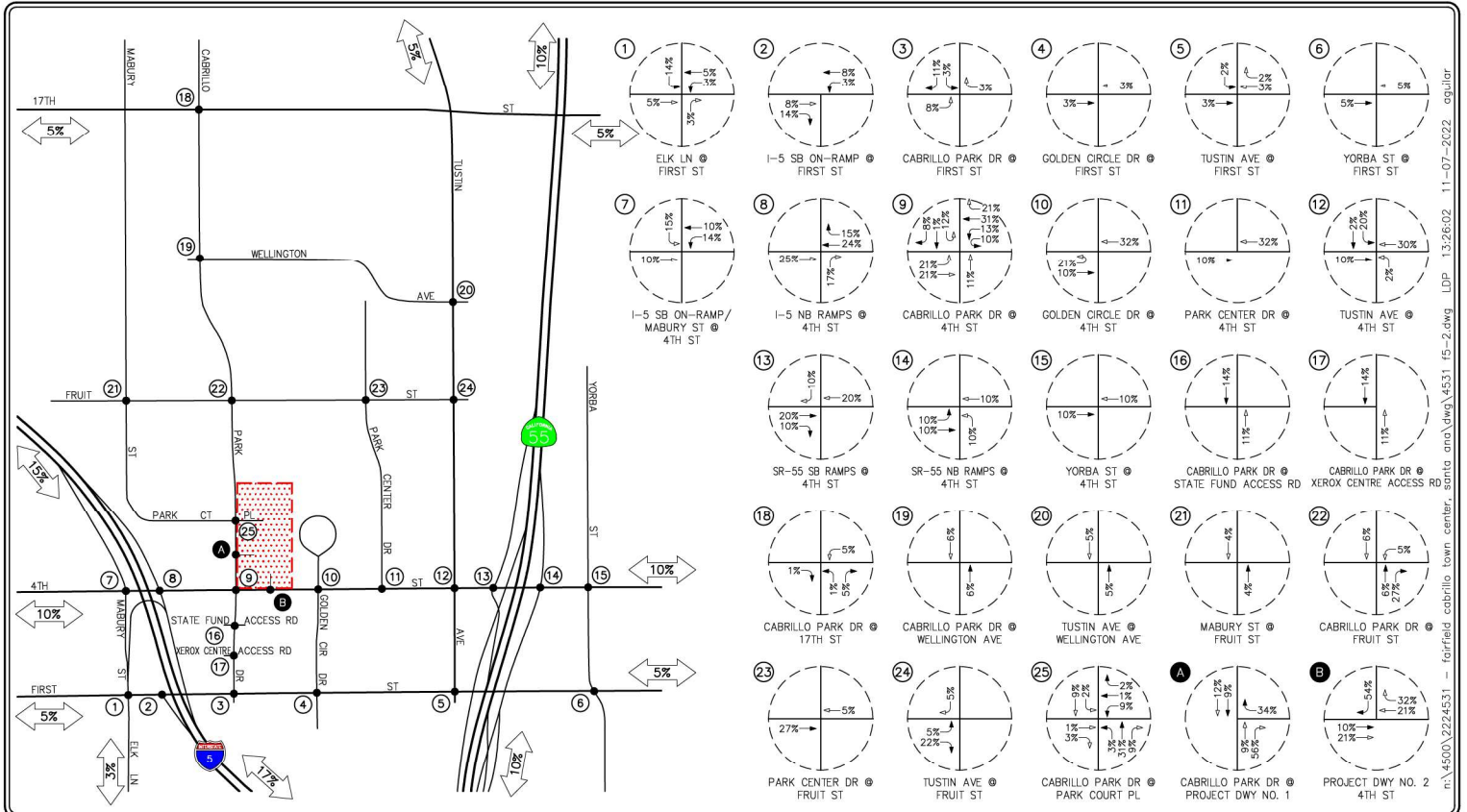
TE/DU = Trip End per Dwelling Unit

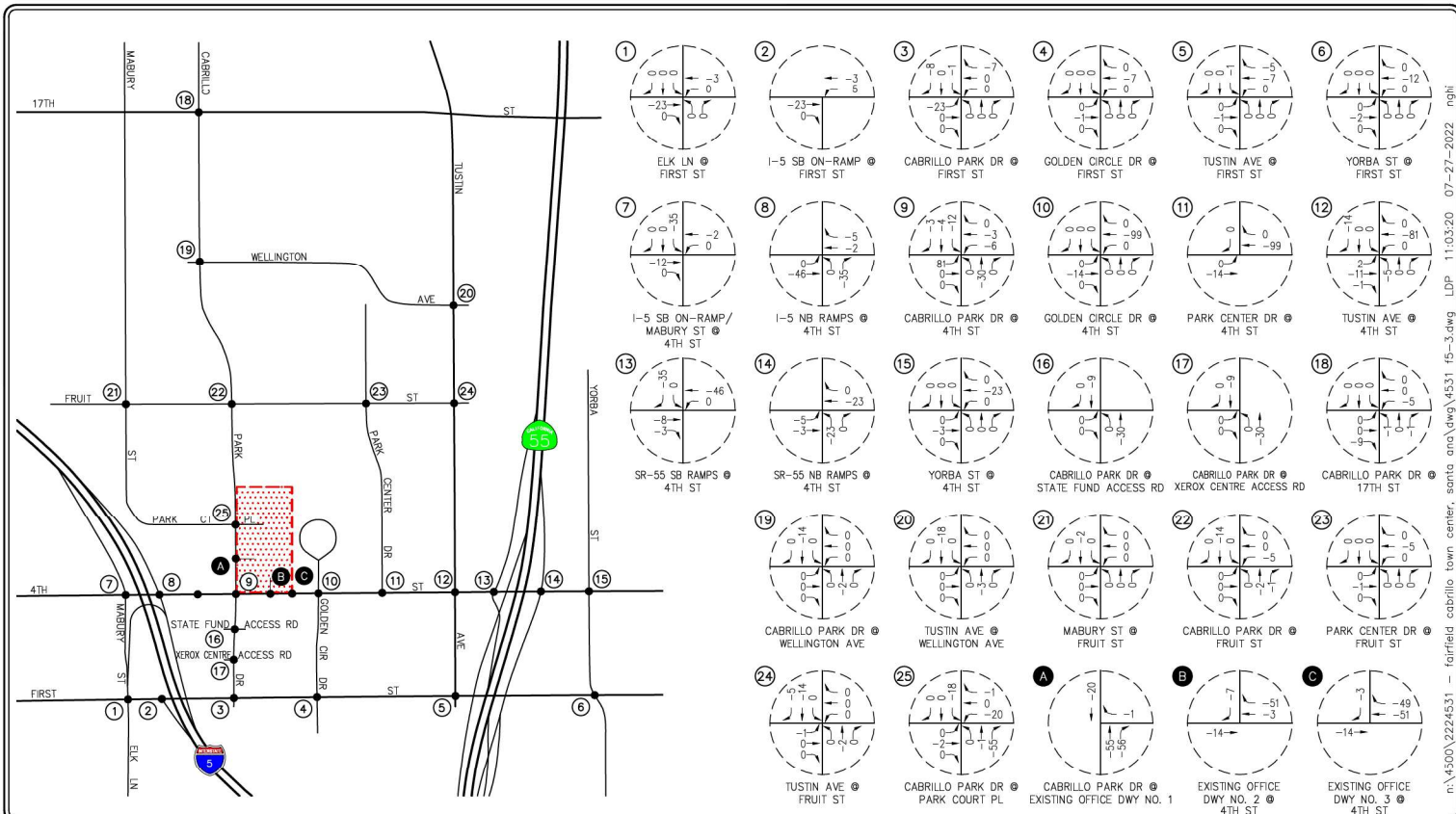
² Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).

TABLE 5-2
PROJECT DIRECTIONAL DISTRIBUTION PATTERN

Distribution Percentage	Orientation/Direction
15%	To/from the north via I-5 Freeway
17%	To/from the south via I-5 Freeway
10%	To/from the north via SR-55 Freeway
10%	To/from the south via SR-55 Freeway
6%	To/from the north via Cabrillo Park Drive
4%	To/from the north via Parkcourt Place/Marbury Street
5%	To/from the north via Tustin Avenue
3%	To/from the south via Elk Avenue
10%	To/from the east via Fourth Street/Irvine Boulevard
10%	To/from the west via Fourth Street
5%	To/from the east via First Street
5%	To/from the west via First Street
100%	Total







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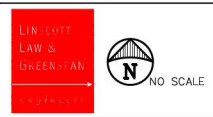


FIGURE 5-3

EXISTING OFFICE AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

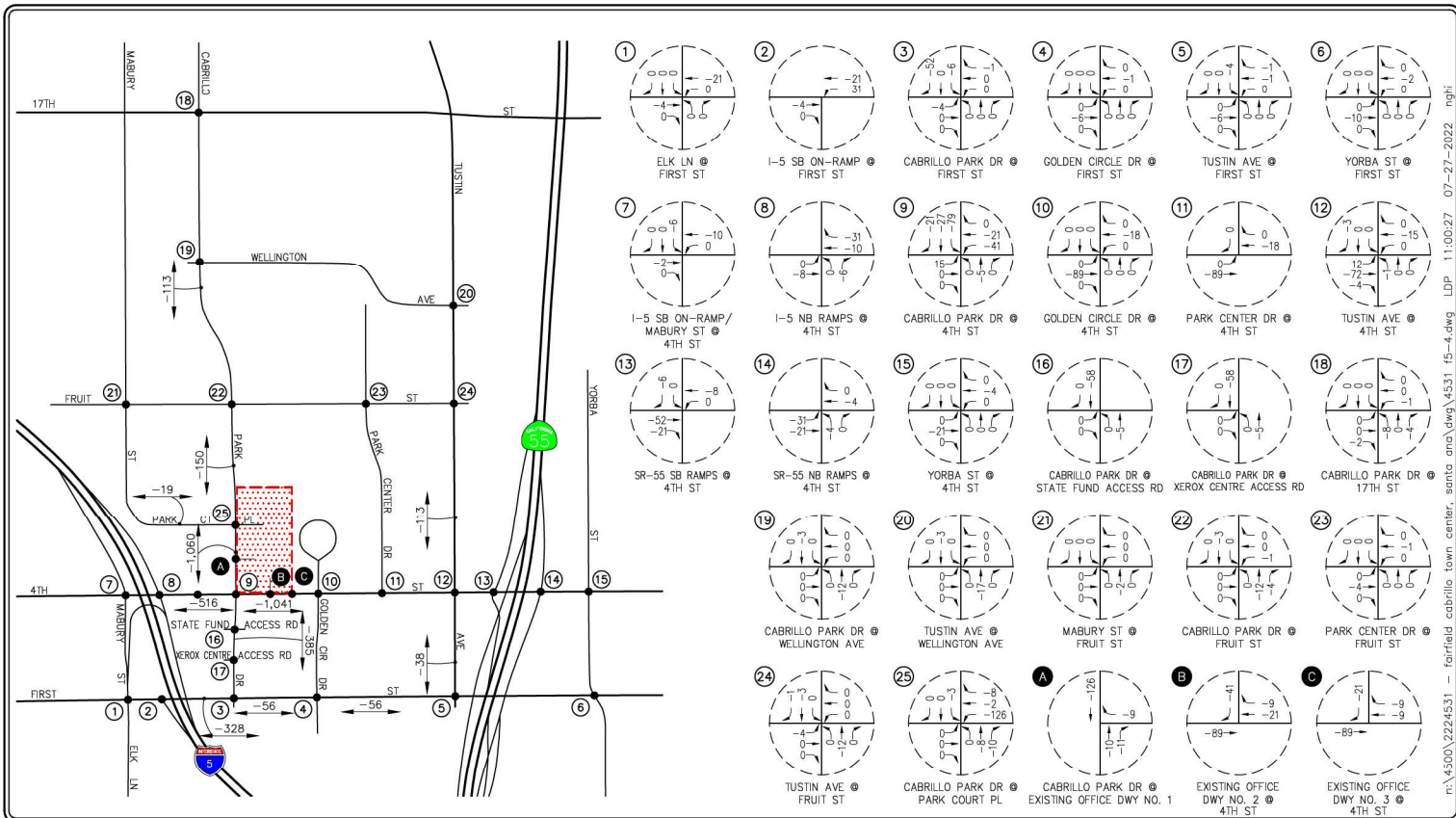


FIGURE 5-4

EXISTING OFFICE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

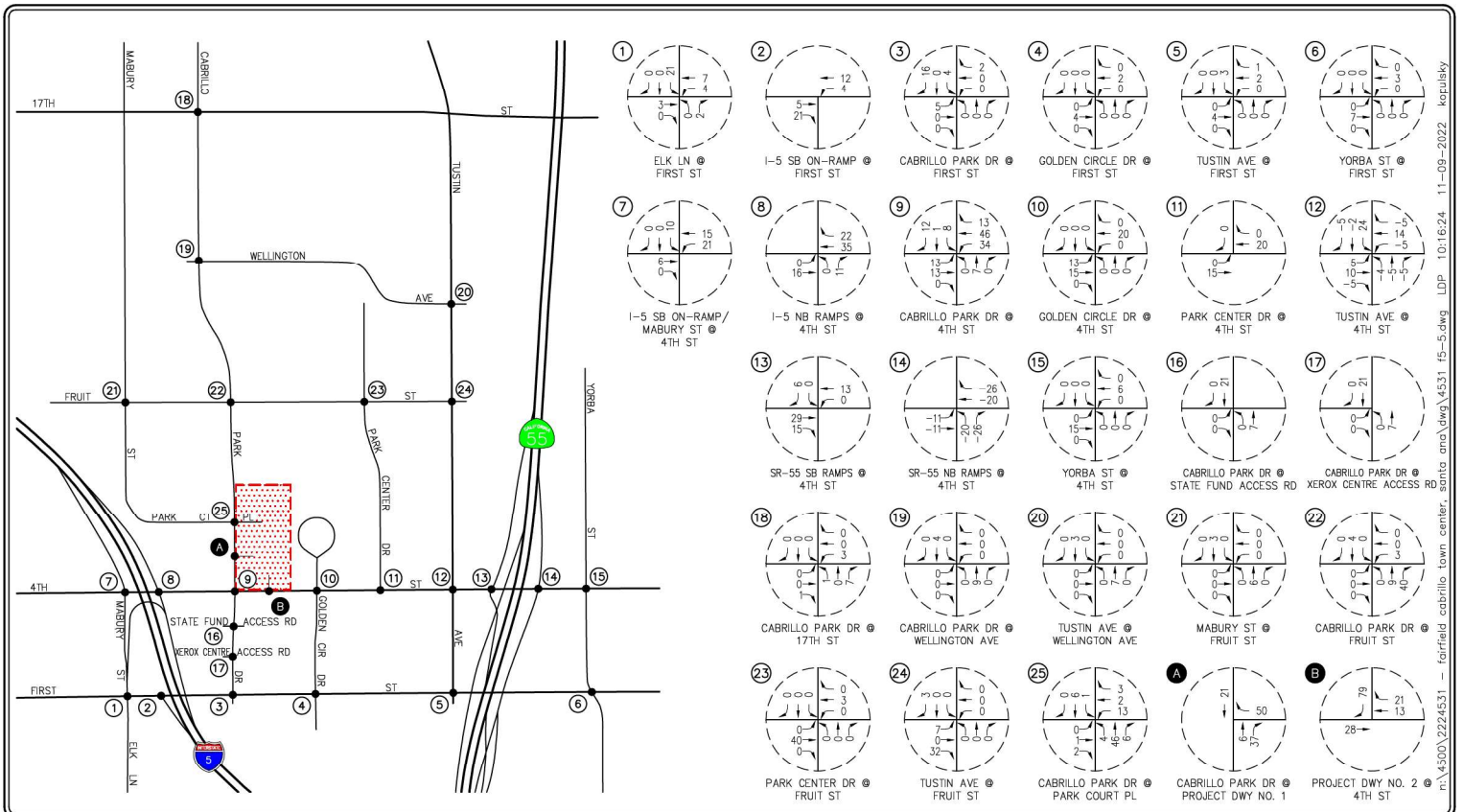


FIGURE 5-5

AM PEAK HOUR PROJECT TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

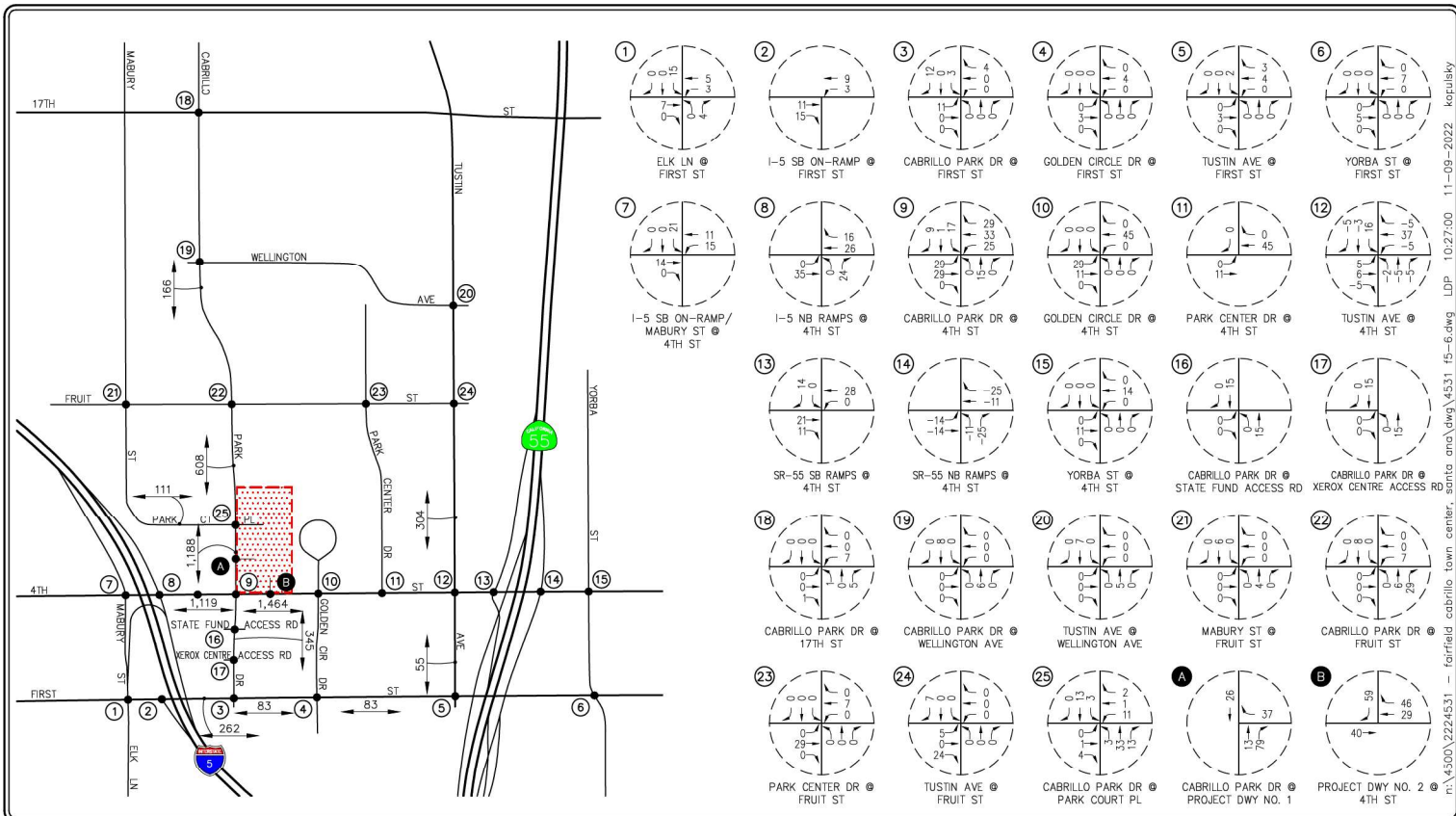


FIGURE 5-6

PM PEAK HOUR AND DAILY PROJECT TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

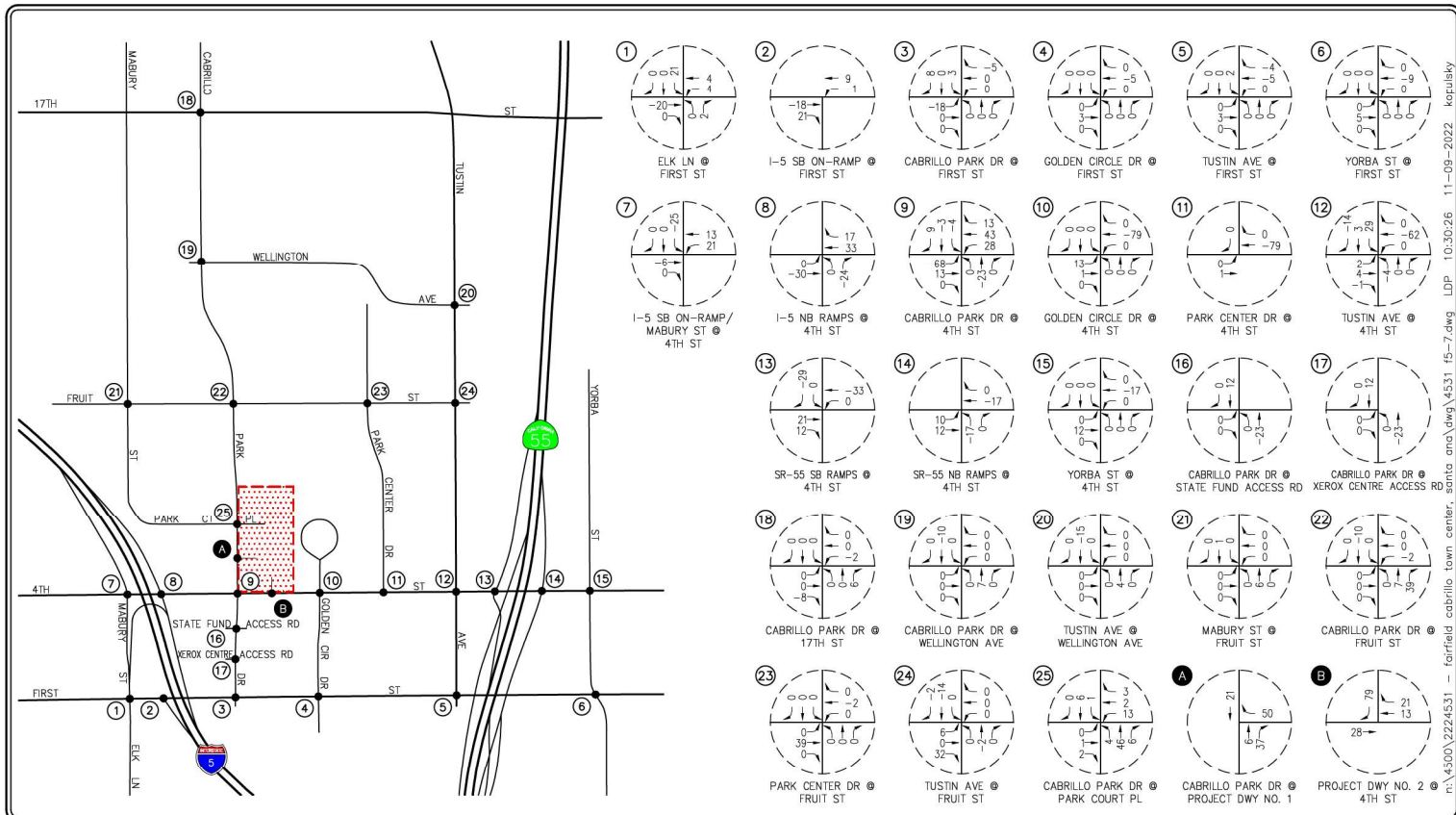
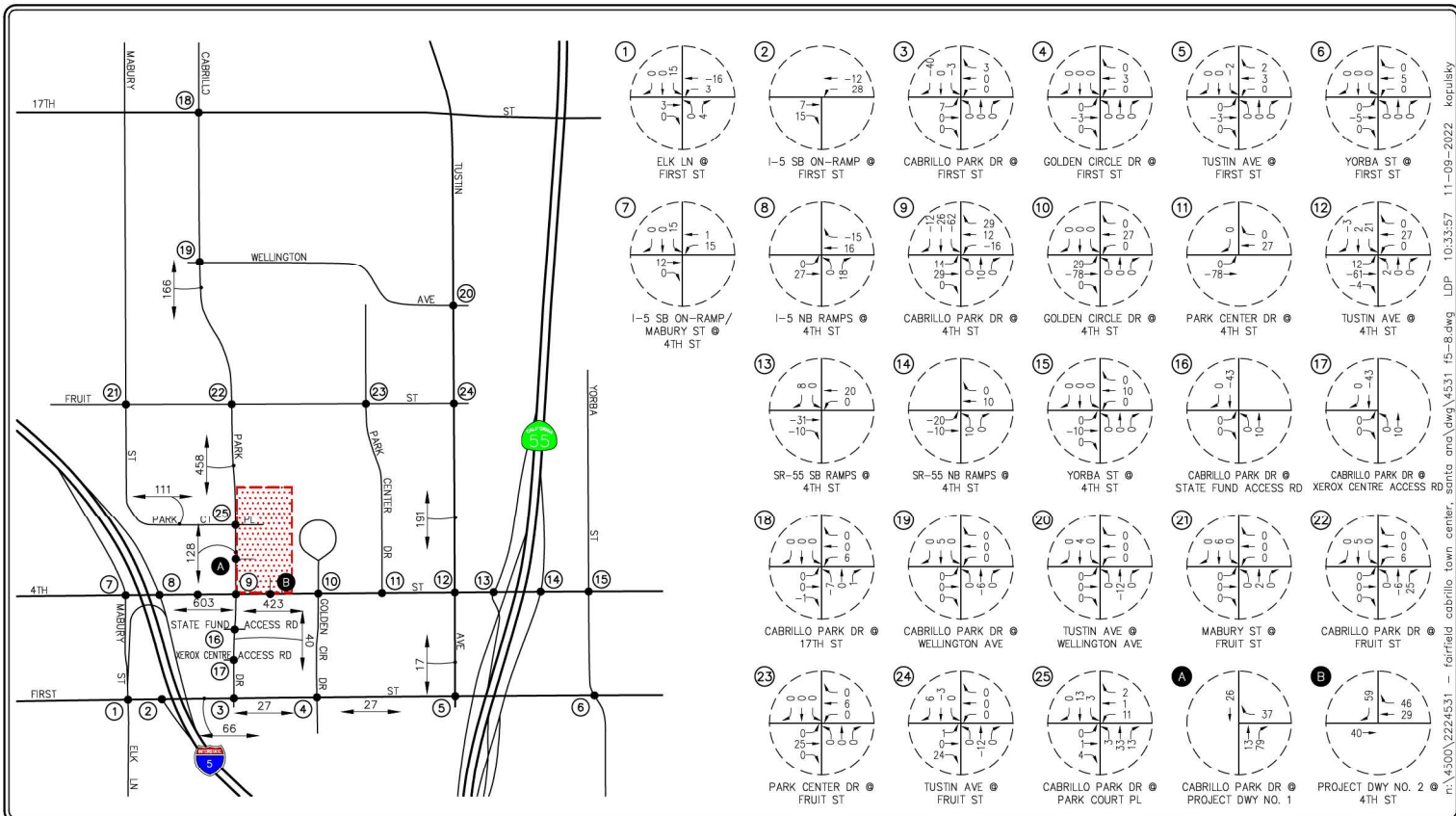


FIGURE 5-7

AM PEAK HOUR NET PROJECT TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA



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FIGURE 5-8

PM PEAK HOUR AND DAILY NET PROJECT TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA



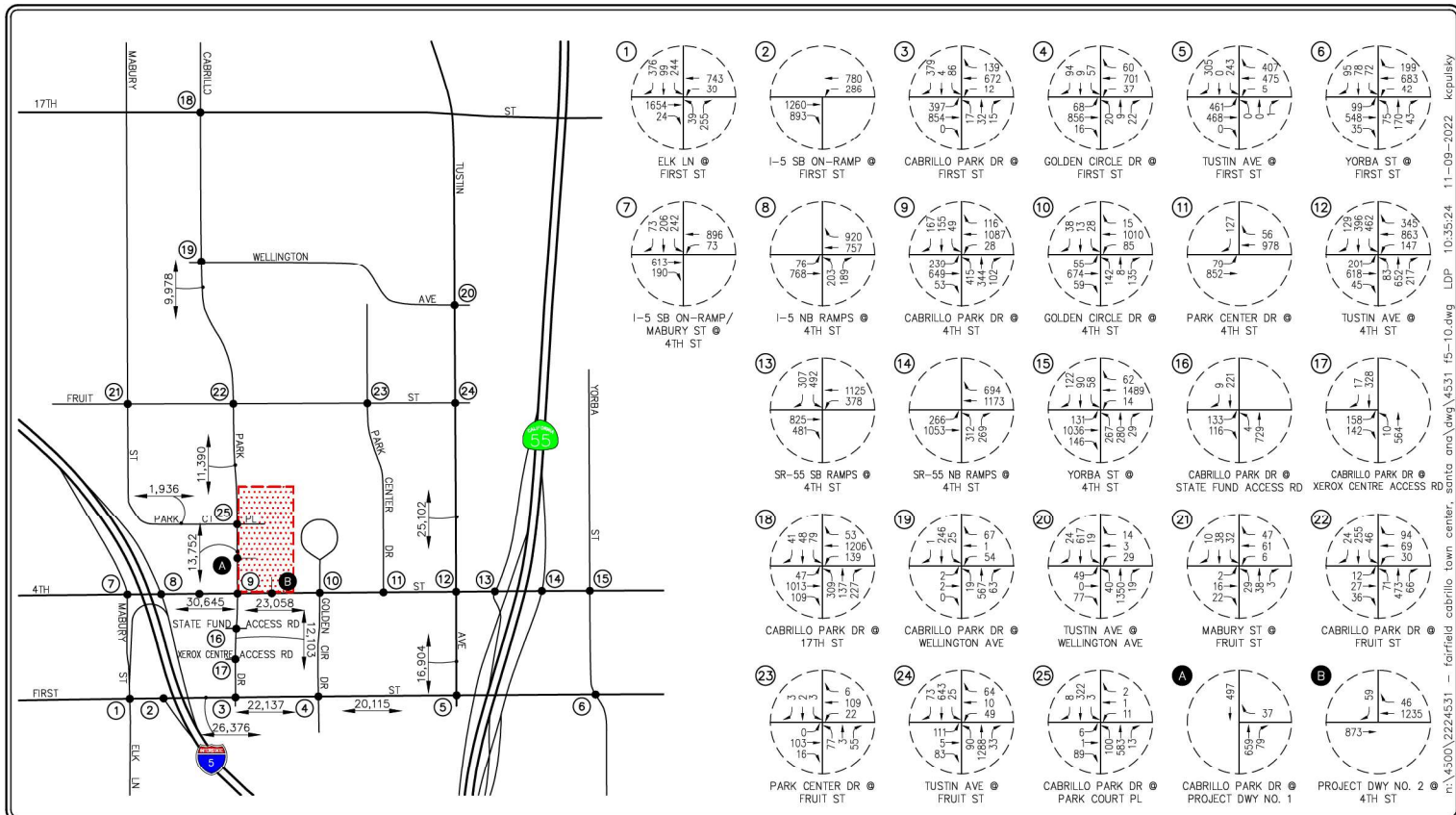


FIGURE 5-10

EXISTING PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2022 existing baseline conditions, this factor results in a 4.0% growth in existing volumes to the near-term horizon year 2026.

6.2 Related Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (related projects) within a two-mile radius of the proposed project has been researched at the Cities of Santa Ana, Tustin and Orange. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development.

Based on our research during the scoping process, there are twenty-eight (28) related projects located in the City of Santa Ana, eight (8) related projects located in the City of Tustin and one (1) related project located in the City of Orange. These thirty-seven (37) related projects have been included as part of the cumulative background setting.

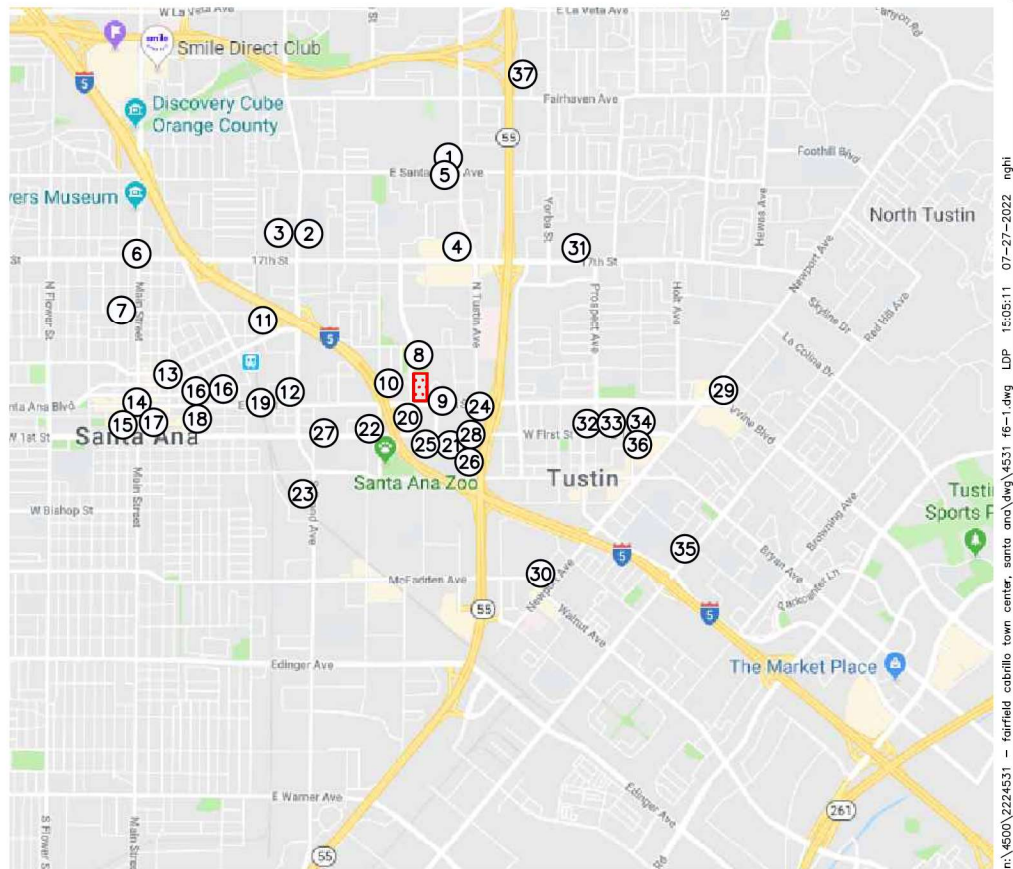
Table 6-1 provides a brief description for each of the thirty-seven (37) related projects. **Figure 6-1** graphically illustrates the location of the thirty-seven (37) related projects. These related projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections.

Table 6-2 summarizes the trip generation potential for all thirty-seven (37) related projects on a daily and peak hour basis for a typical weekday. As shown, the related projects are expected to generate 50,043 daily trips, with 3,338 trips (1,378 inbound, 1,960 outbound) anticipated during the AM peak hour and 4,098 trips (2,266 inbound, 1,832 outbound) produced during the PM peak hour.

The AM and PM peak hour traffic volumes associated with the thirty-seven (37) related projects in the Year 2026 are presented in **Figures 6-2** and **6-3**, respectively. **Figure 6-3** also presents the daily related project traffic volumes.

KEY

1. MCDONALDS RESTAURANT
2. SCHOLARSHIP PREP SCHOOL
3. CHUZE FITNESS SHOPPING CENTER
4. BAJA FISH TACOS
5. TUSTIN SERVICE STATION AND CAR WASH
6. FARMERS & MERCHANTS BANK
7. ONE BROADWAY PLAZA
8. INNOVATIVE HOUSING OPPORTUNITIES MIXED-USE (NORTH)
9. INNOVATIVE HOUSING OPPORTUNITIES MIXED-USE (SOUTH)
10. CENTRAL POINTE
11. THE CROSSROADS AT WASHINGTON
12. AMAZON DISTRIBUTION FACILITY
13. LEGACY SQUARE MIXED-USE DEVELOPMENT
14. SYCAMORE CONDOTEL
15. 3RD & BROADWAY MIXED USE DEVELOPMENT
16. 4TH & MORTIMER MIXED USE DEVELOPMENT
17. FIRST AMERICAN PLAZA
18. THE SOUND CHANGE OF USE
19. LACY CROSSING
20. THE MADISON
21. AMG EAST FIRST APARTMENTS/1ST POINT ONE
22. 1660 FIRST STREET ELKS APARTMENTS
23. REXFORD INDUSTRIAL BUILDING
24. RUSSELL/FISHER COMMERCIAL CENTER
25. 2020 E. FIRST STREET MIXED-USE PROJECT
26. METRO EAST SENIOR PARK
27. FIRST STREET FAMILY APARTMENTS
28. 2202 E. FIRST STREET RESIDENTIAL PROJECT
29. ALDI
30. BRASS MONKEY/OCULTO
31. MEDICAL OFFICE BUILDING
32. EAT FANTASTIC
33. RALLY'S BURGERS
34. ACADIA HEALTHCARE
35. THE HILL
36. 99 RANCH MARKET
37. GRACE CHURCH



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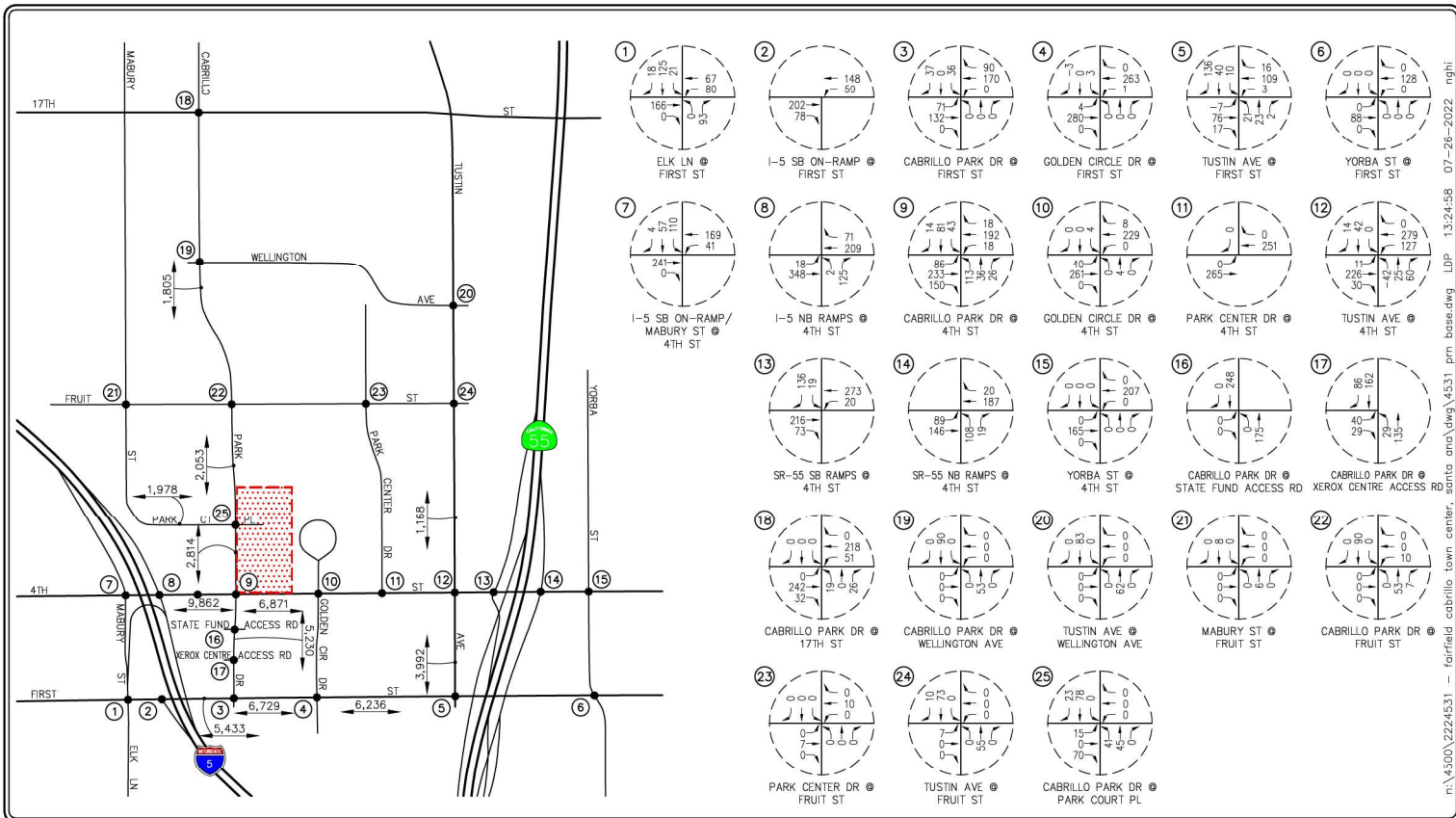
KEY

- = CUMULATIVE PROJECTS LOCATION
- = PROJECT SITE

FIGURE 6-1

LOCATION OF CUMULATIVE PROJECTS
CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA





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FIGURE 6-3

PM PEAK HOUR AND DAILY CUMULATIVE PROJECTS TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

**TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS³**

No.	Cumulative Project	Location/Address	Description
<i>City of Santa Ana</i>			
1.	McDonalds Restaurant	2101-2109 East Santa Clara Avenue	3,987 SF fast-food restaurant with drive-thru
2.	Scholarship Prep School	1821 North Grand Ave	Construction of 17,532 SF charter school with 425 students (TK-4 th Grade)
3.	Chuze Fitness Shopping Center	1900 North Grand Ave	109,276 SF gymnasium
4.	Baja Fish Tacos	2107 East 17 th Street	5,005 SF restaurant
5.	Tustin Service Station and Car Wash	2230 North Tustin Avenue	2,150 SF gas station with 12 VFP
6.	Farmers & Merchants Bank	1702 North Main Street	Construction of 6,233 SF bank
7.	One Broadway Plaza	1109 North Broadway	415 DU residential apartments, 3,200 SF restaurant, and 200,000 SF office/commercial
8.	Innovative Housing Opportunities Mixed-Use (North)	601 North Golden Circle Drive	Demolition of existing 21,586 SF office and construction of 80 DU apartments
9.	Innovative Housing Opportunities Mixed-Use (South)	2021 East Fourth Street	Demolition of existing 20,400 SF office and construction of 80 DU apartments and 15,000 SF commercial
10.	Central Pointe	1801 East 4 th Street	644 DU residential apartments, 11,700 SF retail, and 3,500 SF restaurant
11.	The Crossroads at Washington	1126 East Washington Avenue	86 DU residential apartments
12.	Amazon Distribution Facility	511 North Grand Avenue	Demolition of existing 120,000 SF production/distribution facility and construction of 112,485 SF warehouse/distribution facility
13.	Legacy Square Mixed-Use Development	609 North Spurgeon Street	93 DU residential apartments and 2,722 SF commercial
14.	Sycamore Condotel	515 North Sycamore Street	Converting existing 34,903 SF office to a 60 room hotel
15.	3 rd & Broadway Mixed Use Development	201 West 3 rd Street	171 DU residential apartments, 13,419 SF commercial, and 75 room hotel

Notes:

- SF = Square-feet
- DU = Dwelling units
- VFP = Vehicle Fueling Positions

³ Source: City of Santa Ana, City of Tustin, and City of Orange Planning Department.

TABLE 6-1 (CONTINUED)
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS⁴

No.	Cumulative Project	Location/Address	Description
<i>City of Santa Ana (continued)</i>			
16.	4 th & Mortimer Mixed Use Development	409 & 509 East 4 th Street	Demolition of existing 14,080 SF supermarket and construction of 169 DU apartments, 7,514 SF retail shops, and 3,847 SF restaurant
17.	First American Plaza	421 North Main Street /114 East 5 th Street	220 DU multifamily (mid-rise) and 12,350 SF retail
18.	The Sound Change of Use	400 East 4 th Street	Convert existing 29,550 SF office to commercial/office/religious facility
19.	Lacy Crossing	1008 East 4 th Street	117 DU single-family residences
20.	The Madison	200 North Cabrillo Park Drive	260 DU live/work apartments with 2,507 SF commercial, and 6,561 SF retail
21.	AMG East First Apartments/1 st Point One	2114 East 1 st Street	552 DU apartments and 10,000 SF commercial
22.	1660 First Street Elks Apartments	1660 East 1 st Street	603 DU apartments and 8,900 SF commercial
23.	Rexford Industrial Building	600 South Grand Avenue	138,980 SF industrial
24.	Russell/Fisher Commercial Center	301 North Tustin Avenue	7,368 SF commercial
25.	2020 E. First Street Mixed-Use Project	2020 East 1 st Street	Demolition of existing 110,489 SF office and construction of 86 DU multi-family residential and 2,885 SF commercial
26.	Metro East Senior Park	2222 East 1 st Street	418 DU senior residential apartments
27.	First Street Family Apartments	1440 East 1 st Street	69 DU residential apartments, 47,040 SF existing office demolition
28.	2202 E. First Street Residential Project	2202 East 1 st Street	181 DU residential apartments and 3,000 SF commercial
<i>City of Tustin</i>			
29.	Aldi	1091 Old Irvine Boulevard	18,996 SF commercial building with grocery store
30.	Brass Monkey/Oculto	14401 Newport Avenue	3,167 SF restaurant
31.	Medical Office Building	17631 17 th Street	11,323 SF medical offices

Notes:

- SF = Square-feet
- DU = Dwelling units

⁴ Source: City of Santa Ana, City of Tustin, and City of Orange Planning Department.

TABLE 6-1 (CONTINUED)
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS⁵

No.	Cumulative Project	Location/Address	Description
<i>City of Tustin (Continued)</i>			
32.	Eat Fantastic	171 East 1 st Street	2,958 SF fast-casual restaurant with a drive-thru
33.	Rally's Burgers	14982 Prospect Avenue	972 SF fast-food restaurant with a drive-thru
34.	Acadia Healthcare	535 East 1 st Street, Unit 200	10,610 SF medical office
35.	The Hill	13751 and 13841 Red Hill Avenue	137 DU multi-family residential and 7,000 SF commercial
36.	99 Ranch Market	500 East 1 st Street	30,000 SF commercial building with grocery store
<i>City of Orange</i>			
37.	Grace Church	2201 Fairhaven Avenue	8,663 SF sports complex

Notes:

- SF = Square-feet
- DU = Dwelling units

⁵ Source: City of Santa Ana, City of Tustin, and City of Orange Planning Departments.

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST⁶

Cumulative Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1. McDonalds Restaurant	1,398	45	44	89	31	28	59
2. Scholarship Prep School	786	230	212	442	24	44	68
3. Chuze Fitness Shopping Center	3,770	73	70	143	215	162	377
4. Baja Fish Tacos	437	4	2	6	20	16	36
5. Tustin Service Station and Car Wash	1,548	23	23	46	36	36	72
6. Farmers & Merchants Bank	760	- ⁷	- ⁷	- ⁷	33	43	76
7. One Broadway Plaza	5,274	323	175	498	193	324	517
8. Innovative Housing Opportunities Mixed-Use (North)	305	-21	20	-1	21	-11	10
9. Innovative Housing Opportunities Mixed-Use (South)	1,053	0	32	32	51	20	71
10. Central Pointe ⁸	4,121	82	182	264	205	139	344
11. The Crossroads at Washington	580	8	26	34	28	16	44
12. Amazon Distribution Facility	192	15	4	19	6	14	20
13. Legacy Square Mixed-Use Development	760	13	29	42	35	23	58
14. Sycamore Condotel	479	16	12	28	18	17	35
15. 3 rd & Broadway Mixed Use Development	2,410	53	79	132	103	81	184
16. 4 th & Mortimer Mixed Use Development ⁹	-173	6	38	44	19	-4	15
17. First American Plaza ¹⁰	1,420	26	59	85	70	52	122
18. The Sound Change of Use	1,448	38	25	63	59	58	117
19. Lacy Crossing	1,103	21	61	82	69	41	110
20. The Madison ¹¹	2,010	30	104	134	115	69	184
21. AMG East First Apartments/1 st Point One	4,210	66	177	243	198	124	322
22. 1660 First Street Elks Apartments ¹²	4,648	70	242	312	266	162	428
23. Rexford Industrial Building	677	91	12	103	13	77	90

⁶ Unless otherwise noted, Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).

⁷ It is assumed that the bank is closed during the morning peak traffic hours.

⁸ Source: *Cabrillo Town Center Project (Central Pointe) TIA*, prepared by LLG, dated July 2020.

⁹ Source: *4th and Mortimer Project TIA*, prepared by LLG, dated July 2020.

¹⁰ Source: *First American Plaza 4th & Main Apartments TIA*, prepared by LLG, dated April 2019.

¹¹ Source: *The Madison Mixed-Use Development TIA*, prepared by LLG, dated August 2017.

¹² Source: *1660 E. First Street Elks Apartments TIA*, prepared by LLG, dated June 2018.

TABLE 6-2 (CONTINUED)
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST¹³

Cumulative Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
24. : Russell/Fisher Commercial Center	361	9	6	15	15	14	29
25. : 2020 E. First Street Mixed-Use Project ¹⁴	-461	-132	10	-122	9	-103	-94
26. Metro East Senior Park ¹⁵	1,354	29	55	84	59	46	105
27. First Street Family Apartments ¹⁶	459	7	28	35	28	15	43
28. 2202 E. First Street Residential Project	969	19	54	73	49	34	83
29. Aldi	1,605	29	20	49	65	64	129
30. Brass Monkey/Oculto	306	15	12	27	10	7	17
31. Medical Office Building	408	28	7	35	13	31	44
32. Eat Fantastic	1,037	33	33	66	23	21	44
33. Rally's Burgers	340	11	10	21	8	6	14
34. Acadia Healthcare	382	26	7	33	13	29	42
35. The Hill	1,266	22	48	70	58	40	98
36. 99 Ranch Market	2,551	59	36	95	78	85	163
37. Grace Church	250	11	6	17	10	12	22
Cumulative Projects Total Trip Generation Potential	50,043	1,378	1,960	3,338	2,266	1,832	4,098

¹³ Unless otherwise noted, Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).

¹⁴ Source: *The 2020 E. First Street Mixed-Use Project Traffic Study*, prepared by LLG, dated July 2022.

¹⁵ Although this Project is considered to be built under existing conditions, as a conservative measure it has been included within the cumulative background traffic conditions due to the use of historic Year 2019 traffic count data.

¹⁶ Source: *First Street Family Apartments TIA*, prepared by LLG, dated January 2016. Although this Project is considered to be built under existing conditions, as a conservative measure it has been included within the cumulative background traffic conditions due to the use of existing historic Year 2019 traffic count data.

6.3 Year 2045 Traffic Conditions

As coordinated with City staff, the Year 2045 traffic volume forecasts for this traffic study were development via the utilization of the OCTAM 5.0 Year 2045 traffic model provided by OCTA. Specifically, daily, AM peak period and PM peak period link traffic volumes were provided by OCTA for the existing base year (i.e. Year 2016) and for the Year 2045 year. The AM peak period corresponds to a three-hour morning commute period while the PM peak period corresponds to a four-hour afternoon commute period. Using the peak period model runs and the OCTA approved peak hour factors (i.e. AM = 0.3566 and PM = 0.2662), the one-hour peak hour link traffic volumes were determined. These future year 2045 link traffic volumes were post-processed based on the relationship of the base year validation model run output to the base year ground traffic counts resulting in Year 2045 without project daily traffic volumes for the AM peak hour/PM peak hour turning movements for the key study intersections. Copies of the model post-processing worksheets are contained in *Appendix C*.

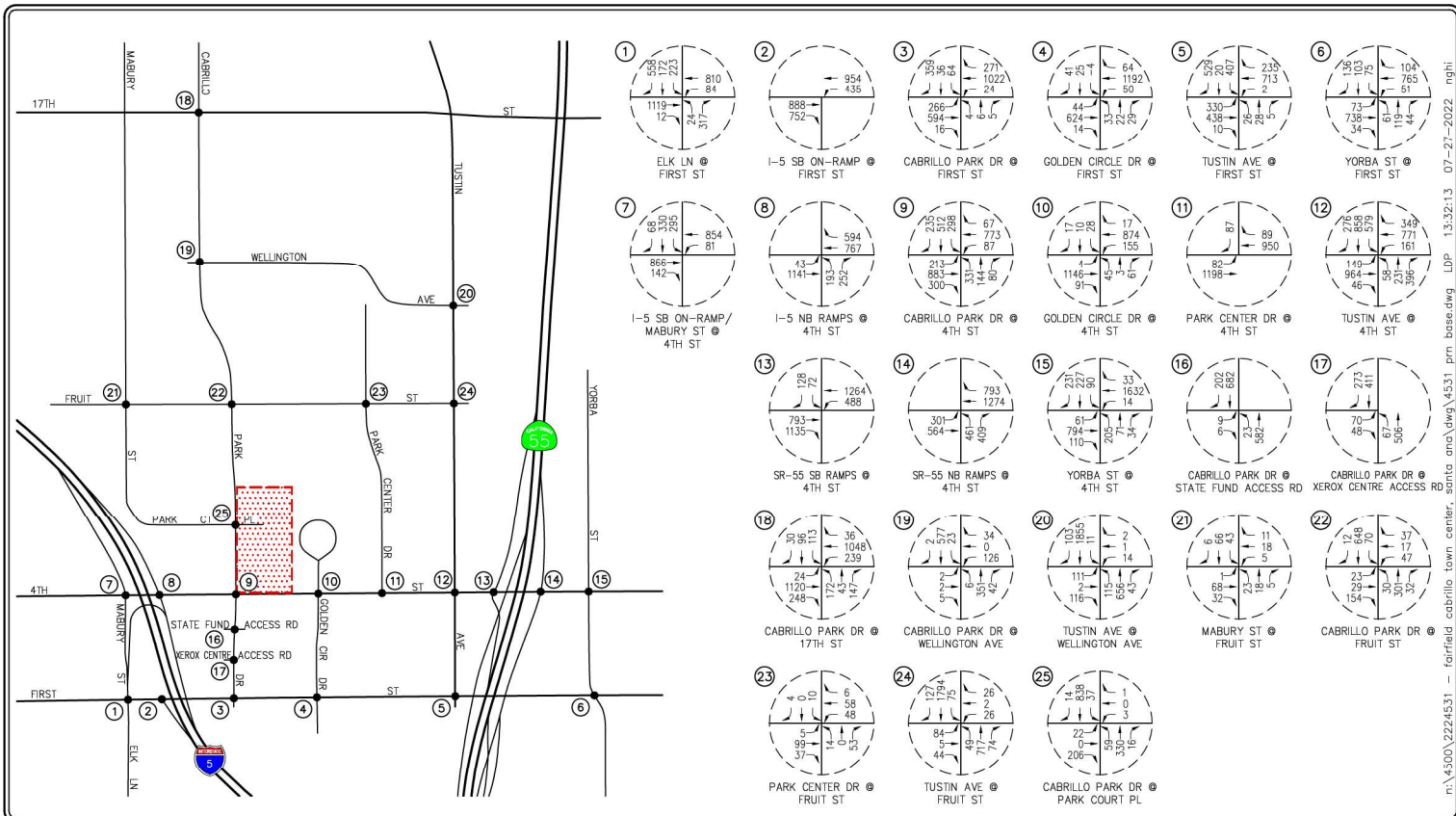
6.4 Year 2026 and Year 2045 Traffic Volumes

6.4.1 Year 2026 Traffic Volumes

Figures 6-4 and *6-5* present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at twenty-five (25) key study intersections for the Year 2026, respectively. *Figure 6-5* also presents the Year 2026 daily cumulative traffic volumes. *Figures 6-6* and *6-7* illustrate the Year 2026 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figure 6-7* also presents the Year 2026 cumulative plus project daily traffic volumes.

6.4.2 Year 2045 Traffic Volumes

Figures 6-8 and *6-9* present the Year 2045 AM and PM peak hour cumulative traffic volumes at the twenty-five (25) key study intersections, respectively. *Figure 6-9* also presents the Year 2045 daily cumulative traffic volumes. *Figures 6-10* and *6-11* illustrate the Year 2045 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figure 6-11* also presents the Year 2045 buildout plus project daily traffic volumes.

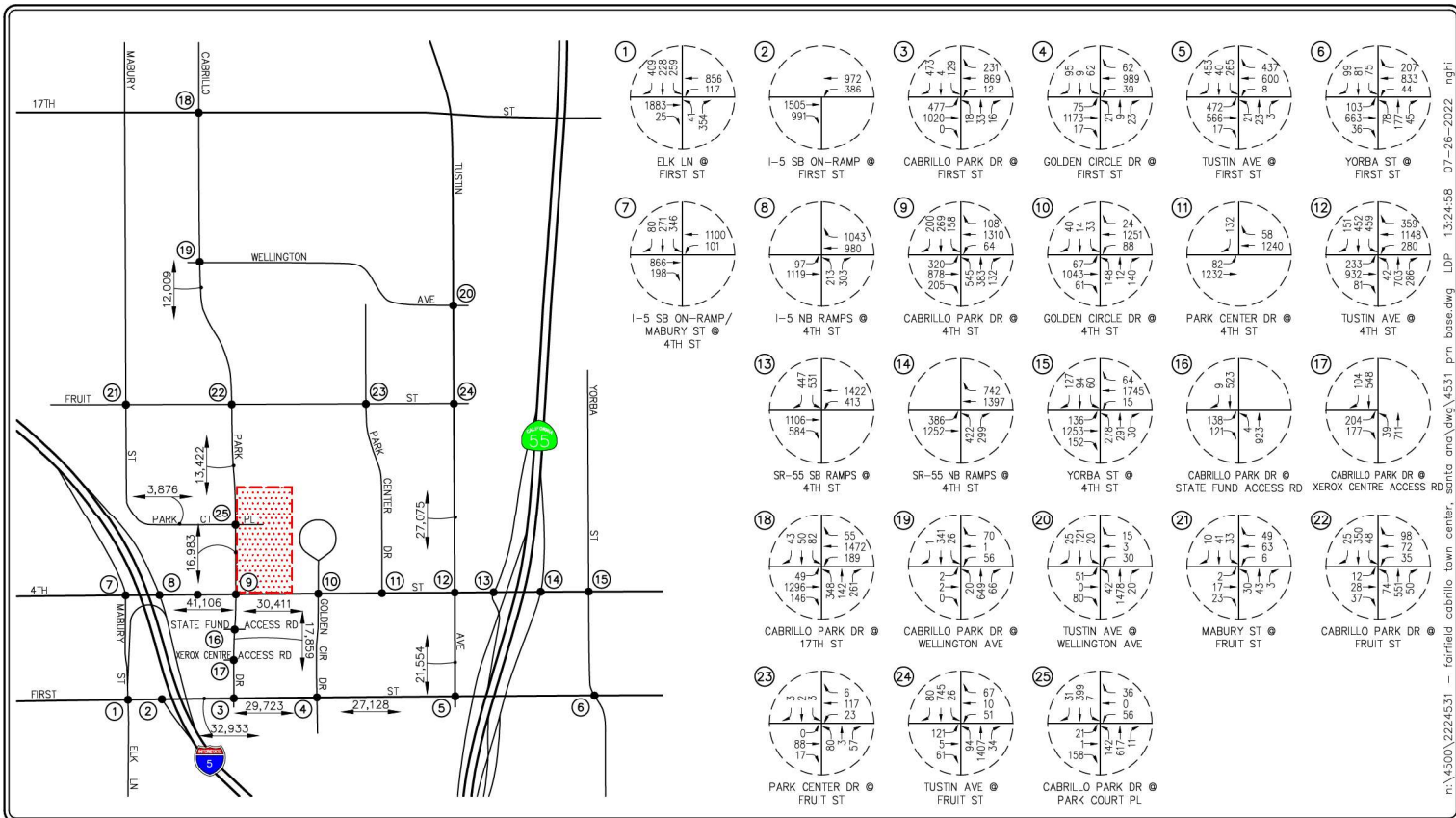


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FIGURE 6-4

YEAR 2026 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA



1 ELK LN @ FIRST ST 408 1863 25 856 117	2 I-5 SB ON-RAMP @ FIRST ST 1505 991	3 CABRILLO PARK DR @ FIRST ST 472 477 1020 231 869 12	4 GOLDEN CIRCLE DR @ FIRST ST 95 62 62 75 1173 17	5 TUSTIN AVE @ FIRST ST 453 40 265 437 600 8	6 YORBA ST @ FIRST ST 88 61 72 103 663 36
7 I-5 SB ON-RAMP/MABURY ST @ 4TH ST 866 198	8 I-5 NB RAMP @ 4TH ST 97 1119 213 1043 303 980	9 CABRILLO PARK DR @ 4TH ST 200 265 158 320 878 205	10 GOLDEN CIRCLE DR @ 4TH ST 49 14 23 67 1043 61	11 PARK CENTER DR @ 4TH ST 132 132 58 82 1232	12 TUSTIN AVE @ 4TH ST 151 452 459 233 932 81
13 SR-55 SB RAMP @ 4TH ST 1106 584	14 SR-55 NB RAMP @ 4TH ST 386 1252 422 742 1397	15 YORBA ST @ 4TH ST 127 94 60 136 1253 152	16 CABRILLO PARK DR @ STATE FUND ACCESS RD 138 121 923	17 CABRILLO PARK DR @ XEROX CENTRE ACCESS RD 104 177 39 204 177	
18 CABRILLO PARK DR @ 17TH ST 120 552 55 1472 189	19 CABRILLO PARK DR @ WELLINGTON AVE 120 348 70 1 56	20 TUSTIN AVE @ WELLINGTON AVE 205 721 15 51 30	21 MABURY ST @ FRUIT ST 19 43 49 2 63 6	22 CABRILLO PARK DR @ FRUIT ST 150 350 98 12 72 35	
23 PARK CENTER DR @ FRUIT ST 120 88 17	24 TUSTIN AVE @ FRUIT ST 80 745 28 121 94 51	25 CABRILLO PARK DR @ PARK COURT PL 158 142 61 36 0 56			

FIGURE 6-5

YEAR 2026 CUMULATIVE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

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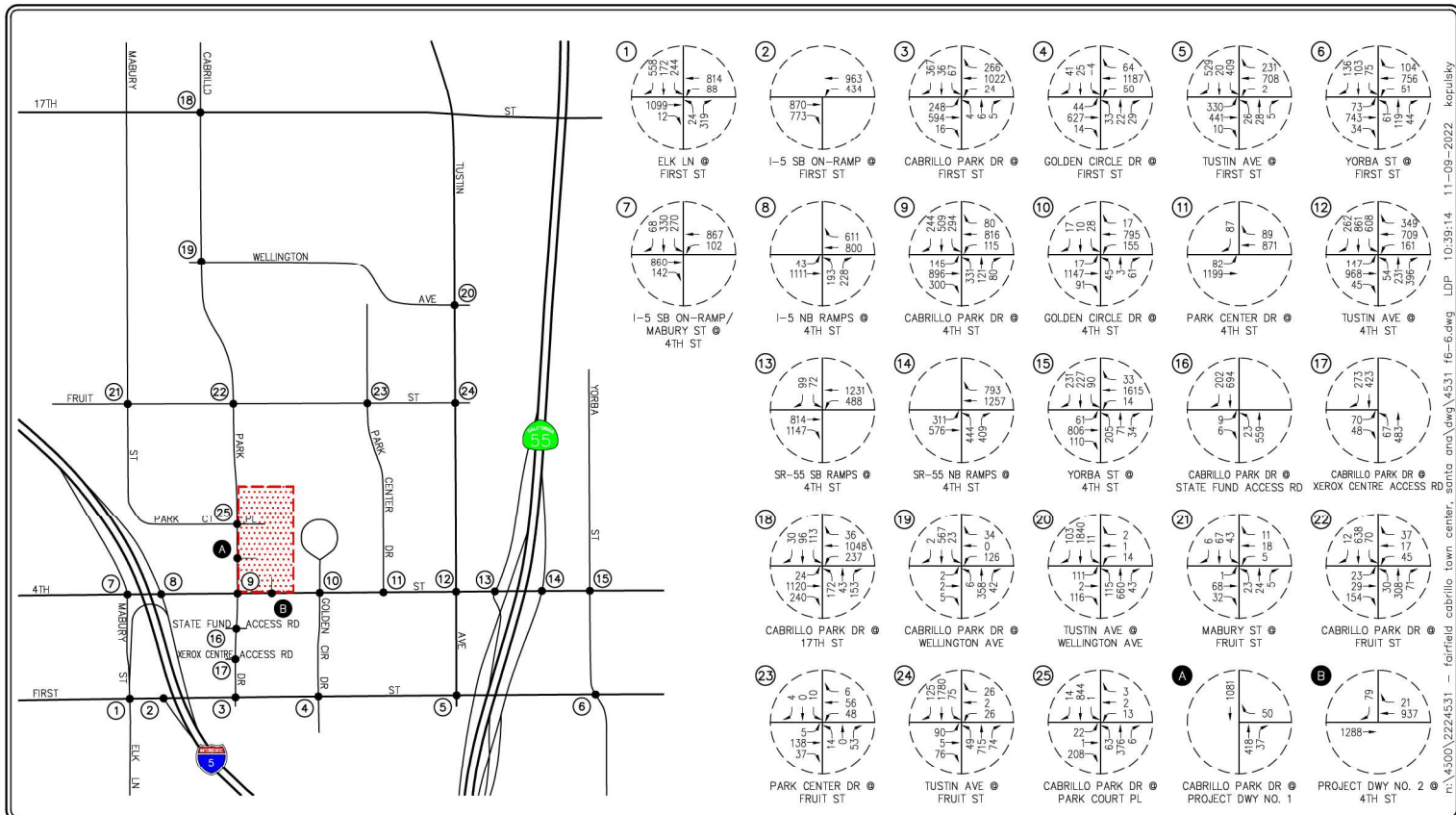


FIGURE 6-6

YEAR 2026 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

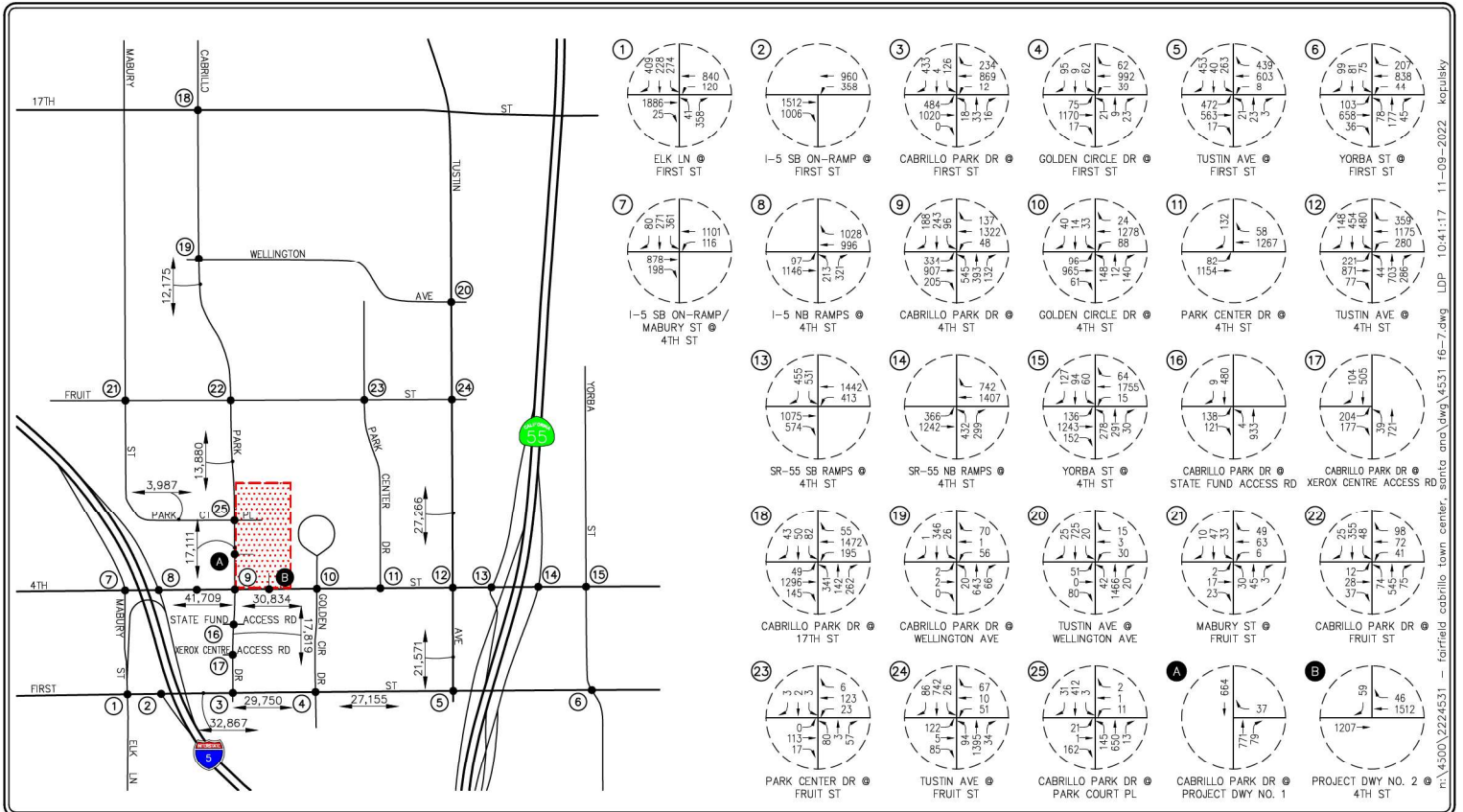
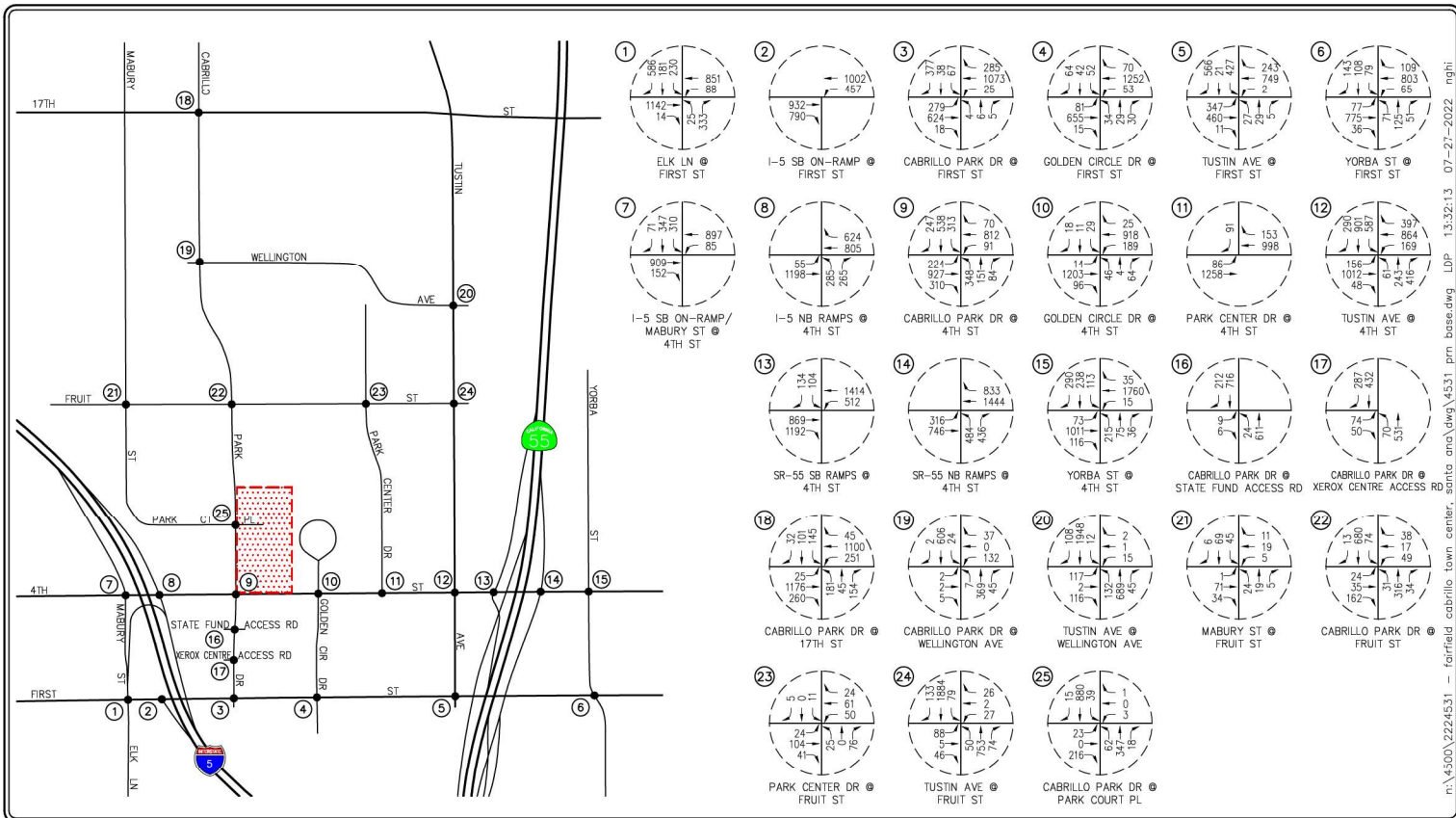


FIGURE 6-7

YEAR 2026 CUMULATIVE PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

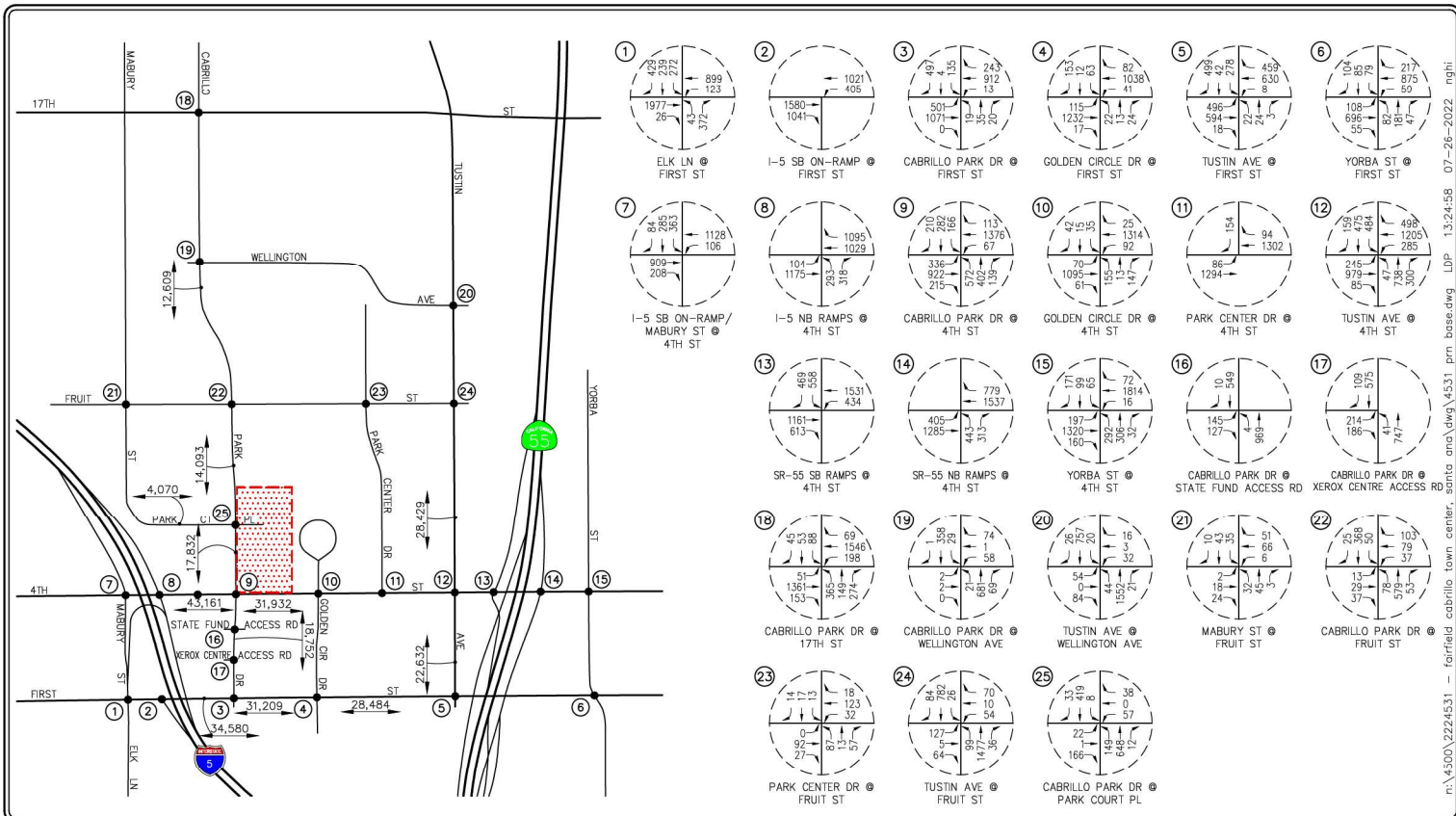


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FIGURE 6-8

YEAR 2045 BUILDOUT AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA



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FIGURE 6-9

YEAR 2045 BUILDOUT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

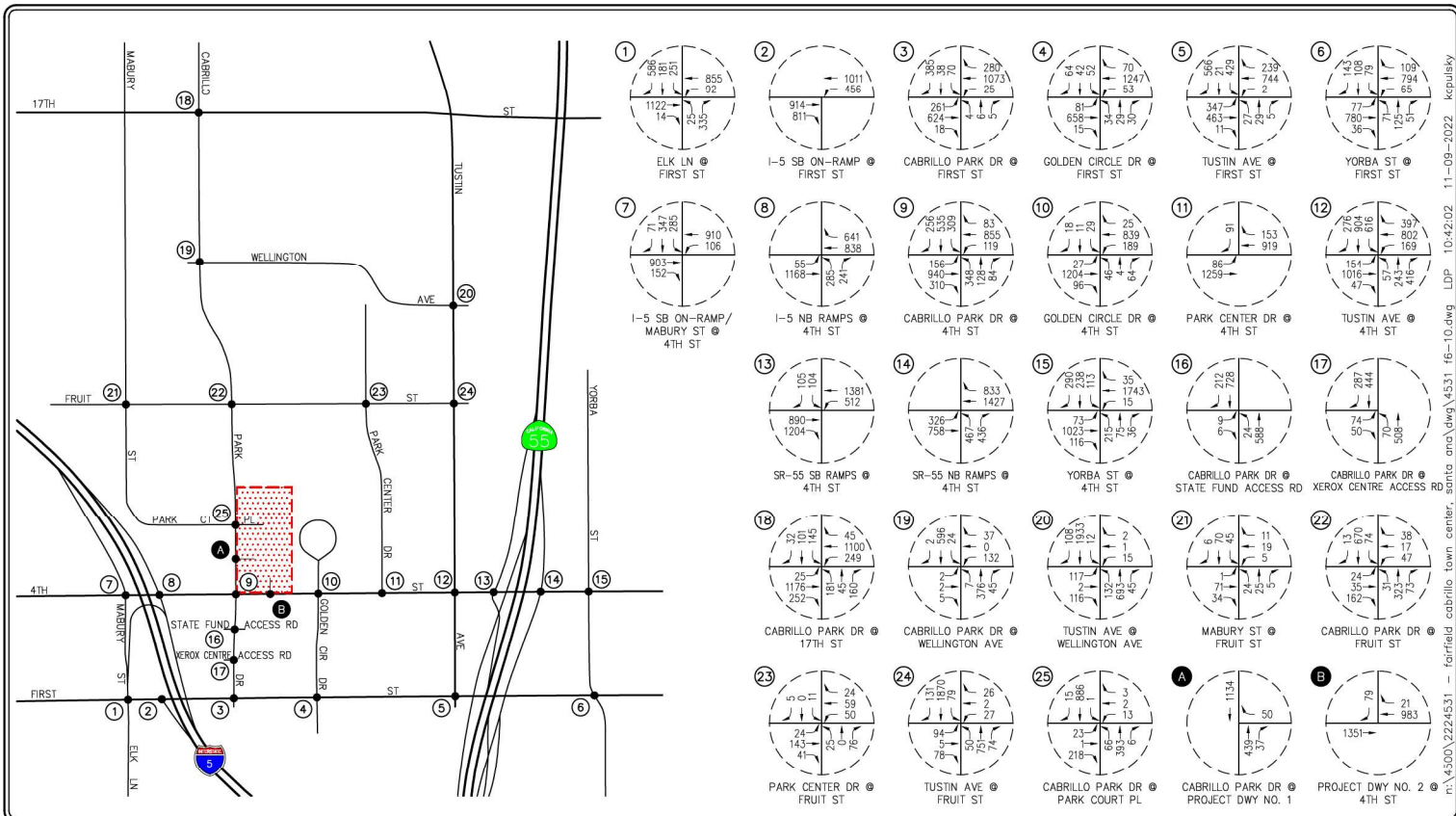


FIGURE 6-10

YEAR 2045 BUILDOUT PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

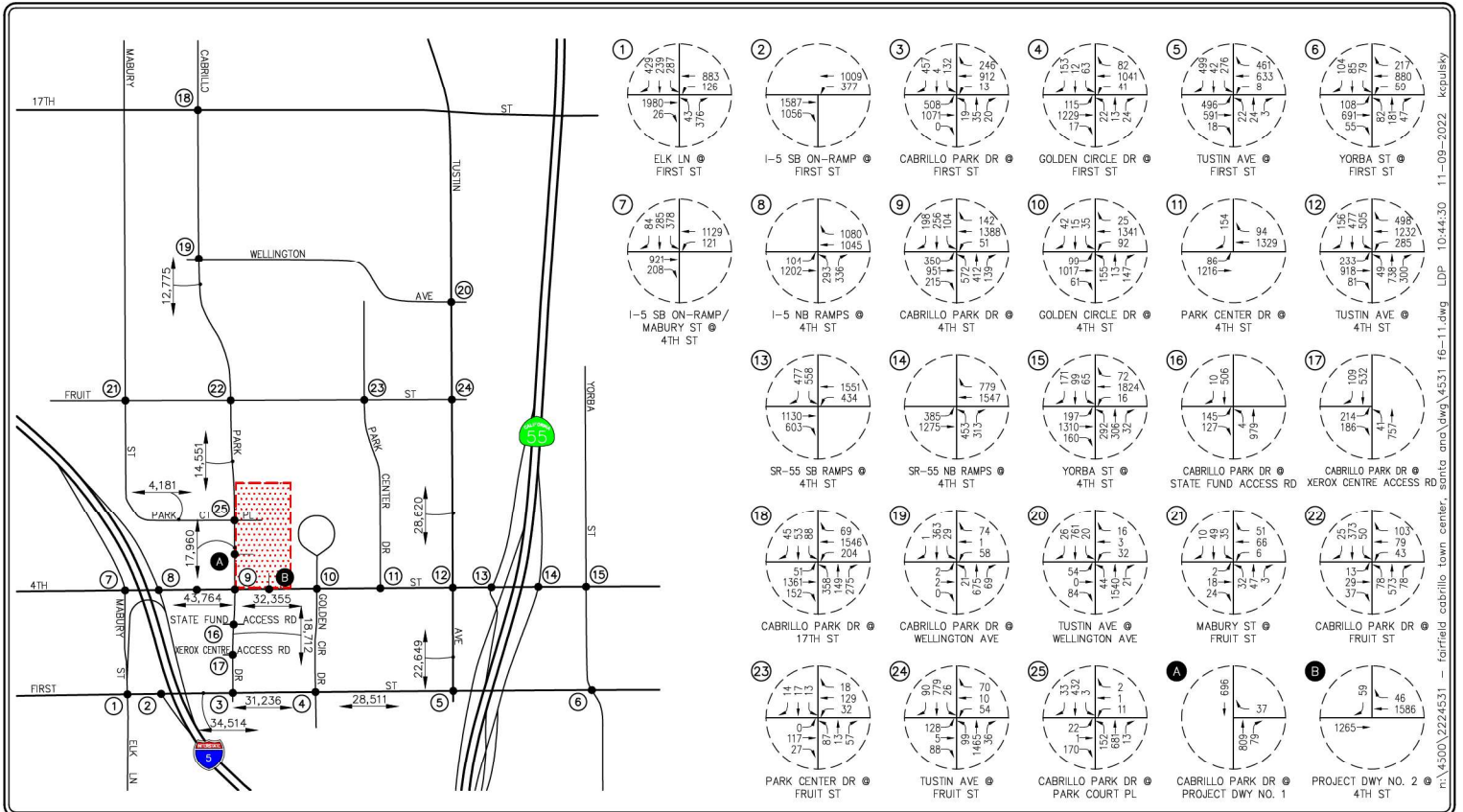


FIGURE 6-11

YEAR 2045 BUILDOUT PLUS PROJECT PM PEAK HOUR AN DAILY TRAFFIC VOLUMES
CABRILLO TOWN CENTER MIXED-USED PROJECT, SANTA ANA

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the proposed Project during the AM peak hour and PM peak hour was evaluated based on analysis of future operating conditions at the twenty-five (25) key study intersections, without, then with, the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The significance of the potential impacts of the Project at each key intersection was then evaluated using the following traffic impact criteria.

7.1 Impact Criteria and Thresholds

7.1.1 *City of Santa Ana*

Based on the City of Santa Ana, impacts to local and regional transportation systems are considered significant if any of the following would occur:

- Project traffic would cause an intersection currently operating at an acceptable peak hour Level of Service (LOS) to operate at an unacceptable peak hour LOS. The City of Santa Ana considers LOS D to be the minimum acceptable LOS for all intersections.
- The project increases traffic demand by 1% of capacity (ICU increase ≥ 0.01) at a signalized study intersection forecast to operate at an acceptable LOS.
- At unsignalized intersections, an impact is considered to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F.

7.1.2 *City of Tustin*

For those study intersections within the jurisdiction of the City of Tustin, impacts to local and regional transportation systems are considered significant if:

- An unacceptable peak hour Level of Service (LOS) at any of the key intersections is projected. The City of Tustin considers LOS D to be the minimum acceptable condition that should be maintained during the peak commute hours. For this analysis, if the project increases traffic demand at the study intersection by 1% of capacity (ICU increase ≥ 0.010), causing or worsening LOS E or F (ICU > 0.901), the impact is considered significant.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the twenty-five (25) key intersections for existing plus project, near-term (Year 2026) and long-term (Year 2045) traffic conditions:

- A. Existing Traffic Conditions;
- B. Existing Plus Project Traffic Conditions;
- C. Scenario (B) with Improvements, if necessary;
- D. Near-Term (Year 2026) Cumulative Traffic Conditions,
- E. Near-Term (Year 2026) Cumulative plus Project Traffic Conditions;
- F. Scenario (E) with Improvements, if necessary;
- G. Long-Term (Year 2045) Future Traffic Conditions;
- H. Long-Term (Year 2045) Future Traffic Conditions plus Project Traffic; and
- I. Scenario (H) with Improvements, if necessary.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Existing Plus Project Analysis

Table 8-1 summarizes the peak hour Level of Service results at the twenty-five (25) key study intersections for existing plus project traffic conditions. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing plus project traffic conditions. The third column (3) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.1.1 Existing Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 8-1* indicates that the twenty-five (25) study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours with the addition of project traffic to existing traffic.

Appendix D presents the existing plus project ICU/LOS and HCM/LOS calculations for the twenty-five (25) key study intersections.

TABLE 8-1
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Exceed LOS Thresholds (2) - (1)		(4) Existing Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Elk Lane at First Street	D	AM PM	0.607 0.727	B C	0.607 0.733	B C	0.000 0.006	No No	-- --	-- --
2. I-5 SB On Ramp at First Street	D	AM PM	Caltrans Intersection, See Section 9.0							
3. Cabrillo Park Drive at First Street	D	AM PM	0.456 0.551	A A	0.445 0.554	A A	-0.011 0.003	No No	-- --	-- --
4. Golden Circle Drive at First Street	D	AM PM	0.337 0.332	A A	0.336 0.332	A A	-0.001 0.000	No No	-- --	-- --
5. Justin Avenue at First Street	D	AM PM	0.351 0.374	A A	0.350 0.375	A A	-0.001 0.001	No No	-- --	-- --
6. Yorba Street at First Street	D	AM PM	0.404 0.484	A A	0.401 0.485	A A	-0.003 0.001	No No	-- --	-- --
7. I-5 SB On Ramp/Mabury Street at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0							
8. I-5 NB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0							
9. Cabrillo Park Drive at 4 th Street	D	AM PM	0.559 0.723	A C	0.550 0.730	A C	-0.009 0.007	No No	-- --	-- --

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Exceed LOS Thresholds (2) – (1)		(4) Existing Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
10. Golden Circle Drive at 4 th Street	D	AM PM	0.412 0.412	A A	0.412 0.436	A A	0.000 0.024	No No	-- --	-- --
11. Park Center Drive at 4 th Street	D	AM PM	13.9 s/v 16.5 s/v	B C	13.3 s/v 16.8 s/v	B C	-0.6 s/v 0.3 s/v	No No	-- --	-- --
12. Tustin Avenue at 4 th Street	D	AM PM	0.609 0.748	B C	0.592 0.753	A C	-0.017 0.005	No No	-- --	-- --
13. SR-55 SB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0							
14. SR-55 NB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0							
15. Yorba Street at 4 th Street	D	AM PM	0.518 0.564	A A	0.515 0.566	A A	-0.003 0.002	No No	-- --	-- --
16. Cabrillo Park Drive at State Fund Access Road	D	AM PM	0.312 0.345	A A	0.316 0.348	A A	0.004 0.003	No No	-- --	-- --
17. Cabrillo Park Drive at Xerox Centre Access Road	D	AM PM	0.274 0.312	A A	0.278 0.315	A A	0.004 0.003	No No	-- --	-- --
18. Cabrillo Park Drive at 17 th Street	D	AM PM	0.575 0.620	A B	0.572 0.619	A B	-0.003 -0.001	No No	-- --	-- --

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Exceed LOS Thresholds (2) – (1)		(4) Existing Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Cabrillo Park Drive at Wellington Avenue	D	AM PM	18.1 s/v 18.3 s/v	C C	18.2 s/v 18.2 s/v	C C	0.1 s/v 0.0 s/v	No No	-- --	-- --
20. Tustin Avenue at Wellington Avenue	D	AM PM	0.583 0.416	A A	0.579 0.413	A A	-0.004 -0.003	No No	-- --	-- --
21. Mabury Street at Fruit Street	D	AM PM	7.7 s/v 7.7 s/v	A A	7.7 s/v 7.7 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
22. Cabrillo Park Drive at Fruit Street	D	AM PM	12.7 s/v 11.7 s/v	B B	12.7 s/v 11.9 s/v	B B	0.0 s/v 0.2 s/v	No No	-- --	-- --
23. Park Center Drive at Fruit Street	D	AM PM	10.3 s/v 10.5 s/v	B B	10.6 s/v 10.8 s/v	B B	0.3 s/v 0.3 s/v	No No	-- --	-- --
24. Tustin Avenue at Fruit Street	D	AM PM	0.516 0.452	A A	0.517 0.450	A A	0.001 -0.002	No No	-- --	-- --
25. Cabrillo Park Drive at Park Court Place	D	AM PM	19.0 s/v 25.1 s/v	C D	21.0 s/v 24.2 s/v	C ¹⁷ C	2.0 s/v -0.9 s/v	No No	0.378 0.275	A ¹⁸ A ¹⁸

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v – seconds per vehicle (delay)

¹⁷ The westbound approach has been conservatively assessed as a shared left/thru/right. If the final design includes an exclusive left turn lane the LOS will be better than reported values

¹⁸ Cabrillo Park Drive at Park Court Place is planned to be converted to a signalized intersection. With implementation of the planned improvement the intersection will continue to operate at acceptable service levels, as shown in column 4.

8.2 Year 2026 Traffic Conditions

Table 8-2 summarizes the peak hour Level of Service results at the twenty-five (25) key study intersections for the Year 2026 horizon year. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-2* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2026 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.2.1 Year 2026 Cumulative Traffic Conditions

Review of column (2) of *Table 8-2* indicates that the one (1) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.941	E

8.2.2 Year 2026 Cumulative Plus Project Conditions

Review of columns (3) and (4) of *Table 8-2* indicates that two (2) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.946	E
9. Cabrillo Park Drive at 4 th Street	--	--	0.903	E

Although the intersection of Elk Lane/First Street operates adversely during the PM peak hour, the proposed Project adds less than 0.010 increment to the ICU value and is therefore does not require recommended improvements based on the LOS standards and criteria specified in this report.

Review of column (5) of *Table 8-2* indicates that Cabrillo Park Drive/4th Street exceeds the level of service thresholds and requires Project-related improvements. However, a review of column (5) indicates that the implementation of recommended improvements at this study intersection will help offset the Project's increment. Recommended improvements are discussed in Section 12.0.

Appendix D also presents the near-term ICU/LOS and HCM/LOS calculations for the twenty-five (25) key study intersections.

TABLE 8-2
YEAR 2026 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2026 Cumulative Traffic Conditions		(3) Year 2026 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) – (1)		(5) Year 2026 Cumulative Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Elk Lane at First Street	D	AM	0.607	B	0.764	C	0.764	C	0.000	No	--	--
		PM	0.727	C	0.941	E	0.946	E	0.005	No	--	--
2. I-5 SB On Ramp at First Street	D	AM	Caltrans Intersection, See Section 9.0									
		PM										
3. Cabrillo Park Drive at First Street	D	AM	0.456	A	0.554	A	0.554	A	0.000	No	--	--
		PM	0.551	A	0.692	B	0.695	B	0.003	No	--	--
4. Golden Circle Drive at First Street	D	AM	0.337	A	0.401	A	0.400	A	-0.001	No	--	--
		PM	0.332	A	0.400	A	0.400	A	0.000	No	--	--
5. Tustin Avenue at First Street	D	AM	0.351	A	0.464	A	0.463	A	-0.001	No	--	--
		PM	0.374	A	0.434	A	0.435	A	0.001	No	--	--
6. Yorba Street at First Street	D	AM	0.404	A	0.439	A	0.436	A	-0.003	No	--	--
		PM	0.484	A	0.541	A	0.543	A	0.002	No	--	--
7. I-5 SB On Ramp/Mabury Street at 4 th Street	D	AM	Caltrans Intersection, See Section 9.0									
		PM										
8. I-5 NB Ramps at 4 th Street	D	AM	Caltrans Intersection, See Section 9.0									
		PM										
9. Cabrillo Park Drive at 4 th Street	D	AM	0.559	A	0.660	B	0.622	B	-0.038	No	0.604	B
		PM	0.723	C	0.891	D	0.903	E	0.012	Yes	0.858	D

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-2 (CONTINUED)
YEAR 2026 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2026 Cumulative Traffic Conditions		(3) Year 2026 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) – (1)		(5) Year 2026 Cumulative Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
10. Golden Circle Drive at 4 th Street	D	AM	0.412	A	0.467	A	0.467	A	0.000	No	--	--
		PM	0.412	A	0.504	A	0.528	A	0.024	No	--	--
11. Park Center Drive at 4 th Street	D	AM	13.9 s/v	B	15.5 s/v	C	14.8 s/v	B	-0.7 s/v	No	--	--
		PM	16.5 s/v	C	21.1 s/v	C	21.7 s/v	C	0.6 s/v	No	--	--
12. Tustin Avenue at 4 th Street	D	AM	0.609	B	0.805	D	0.800	C	-0.005	No	--	--
		PM	0.748	C	0.859	D	0.864	D	0.005	No	--	--
13. SR-55 SB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
14. SR-55 NB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
15. Yorba Street at 4 th Street	D	AM	0.518	A	0.559	A	0.556	A	-0.003	No	--	--
		PM	0.564	A	0.627	B	0.629	B	0.002	No	--	--
16. Cabrillo Park Drive at State Fund Access Road	D	AM	0.312	A	0.346	A	0.350	A	0.004	No	--	--
		PM	0.345	A	0.408	A	0.411	A	0.003	No	--	--
17. Cabrillo Park Drive at Xerox Centre Access Road	D	AM	0.274	A	0.349	A	0.353	A	0.004	No	--	--
		PM	0.312	A	0.406	A	0.392	A	-0.014	No	--	--
18. Cabrillo Park Drive at 17 th Street	D	AM	0.575	A	0.671	B	0.668	B	0.003	No	--	--
		PM	0.620	B	0.744	C	0.743	C	-0.001	No	--	--

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-2 (CONTINUED)
YEAR 2026 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2026 Cumulative Traffic Conditions		(3) Year 2026 Cumulative Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) - (1)		(5) Year 2026 Cumulative Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Cabrillo Park Drive at Wellington Avenue	D	AM	18.1 s/v	C	23.5 s/v	C	23.6 s/v	C	0.1 s/v	No	--	--
		PM	18.3 s/v	C	22.6 s/v	C	22.4 s/v	C	-0.2 s/v	No	--	--
20. Tustin Avenue at Wellington Avenue	D	AM	0.583	A	0.612	B	0.609	B	-0.003	No	--	--
		PM	0.416	A	0.443	A	0.441	A	-0.002	No	--	--
21. Mabury Street at Fruit Street	D	AM	7.7 s/v	A	7.8 s/v	A	7.8 s/v	A	0.0 s/v	No	--	--
		PM	7.7 s/v	A	7.8 s/v	A	7.8 s/v	A	0.0 s/v	No	--	--
22. Cabrillo Park Drive at Fruit Street	D	AM	12.7 s/v	B	14.3 s/v	B	14.4 s/v	B	0.1 s/v	No	--	--
		PM	11.7 s/v	B	13.4 s/v	B	13.7 s/v	B	0.3 s/v	No	--	--
23. Park Center Drive at Fruit Street	D	AM	10.3 s/v	B	10.5 s/v	B	10.8 s/v	B	0.3 s/v	No	--	--
		PM	10.5 s/v	B	10.7 s/v	B	11.1 s/v	B	0.4 s/v	No	--	--
24. Tustin Avenue at Fruit Street	D	AM	0.516	A	0.550	A	0.550	A	0.000	No	--	--
		PM	0.452	A	0.484	A	0.482	A	-0.002	No	--	--
25. Cabrillo Park Drive at Park Court Place	D	AM	19.0 s/v	C	0.498	A	0.481	A ¹⁹	-0.017	No	--	--
		PM	25.1 s/v	D	0.421	A	0.371	A	-0.050	No	--	--

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

¹⁹ The westbound approach has been conservatively assessed as a shared left/thru/right. If the final design includes an exclusive left turn lane the LOS will be better than reported values

8.3 Year 2045 Traffic Conditions

Table 8-3 summarizes the peak hour Level of Service results at the twenty-five (25) key study intersections for the Year 2045. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-3* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists projected Year 2045 long-term traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2045 long-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.3.1 Year 2045 Traffic Conditions

Review of column (2) of *Table 8-3* indicates that the three (3) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.985	E
9. Cabrillo Park Drive at 4 th Street	--	--	0.933	E
12. Tustin Avenue at 4 th Street	--	--	0.925	E

8.3.2 Year 2045 Plus Project Traffic Conditions

Review of columns (3) of *Table 8-3* indicates that three (3) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.990	E
9. Cabrillo Park Drive at 4 th Street	--	--	0.945	E
12. Tustin Avenue at 4 th Street	--	--	0.930	E

Although the intersection of Elk Lane/First Street and Tustin Avenue/4th Street operates adversely during the PM peak hour, the proposed Project adds less than 0.010 increment to the ICU value and is therefore does not require recommended improvements based on the LOS standards and criteria specified in this report.

Review of column (5) of *Table 8-3* indicates that Cabrillo Park Drive/4th Street exceeds the level of service thresholds and requires Project-related improvements. However, a review of column (5) indicates that the implementation of recommended improvements at this study intersection will help offset the Project's increment. Recommended improvements are discussed in Section 12.0.

Appendix D also presents the long-term ICU/LOS and HCM/LOS calculations for the twenty-five (25) key study intersections.

TABLE 8-3
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) – (1)		(5) Year 2045 Buildout Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Elk Lane at First Street	D	AM PM	0.607 0.727	B C	0.794 0.985	C E	0.793 0.990	C E	-0.001 0.005	No No	-- --	-- --
2. I-5 SB On Ramp at First Street	D	AM PM	Caltrans Intersection, See Section 9.0									
3. Cabrillo Park Drive at First Street	D	AM PM	0.456 0.551	A A	0.579 0.724	A C	0.579 0.728	A C	0.013 0.004	No No	-- --	-- --
4. Golden Circle Drive at First Street	D	AM PM	0.337 0.332	A A	0.464 0.472	A A	0.463 0.473	A A	-0.001 0.001	No No	-- --	-- --
5. Tustin Avenue at First Street	D	AM PM	0.351 0.374	A A	0.487 0.455	A A	0.486 0.456	A A	-0.001 0.001	No No	-- --	-- --
6. Yorba Street at First Street	D	AM PM	0.404 0.484	A A	0.464 0.565	A A	0.461 0.567	A A	-0.003 0.002	No No	-- --	-- --
7. I-5 SB On Ramp/Mabury Street at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
8. I-5 NB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
9. Cabrillo Park Drive at 4 th Street	D	AM PM	0.559 0.723	A C	0.691 0.933	B E	0.653 0.945	B E	-0.038 0.012	No Yes	0.628 0.899	B D

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-3 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) - (1)		(5) Year 2045 Buildout Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
10. Golden Circle Drive at 4 th Street	D	AM	0.412	A	0.504	A	0.504	A	0.000	No	--	--
		PM	0.412	A	0.527	A	0.551	A	0.024	No	--	--
11. Park Center Drive at 4 th Street	D	AM	13.9 s/v	B	16.8 s/v	C	16.0 s/v	C	-0.8 s/v	No	--	--
		PM	16.5 s/v	C	25.3 s/v	D	26.0 s/v	D	0.7 s/v	No	--	--
12. Tustin Avenue at 4 th Street	D	AM	0.609	B	0.731	C	0.726	C	-0.005	No	--	--
		PM	0.748	C	0.925	E	0.930	E	0.005	No	--	--
13. SR-55 SB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
14. SR-55 NB Ramps at 4 th Street	D	AM PM	Caltrans Intersection, See Section 9.0									
15. Yorba Street at 4 th Street	D	AM	0.518	A	0.629	B	0.626	B	-0.003	No	--	--
		PM	0.564	A	0.710	C	0.712	C	0.002	No	--	--
16. Cabrillo Park Drive at State Fund Access Road	D	AM	0.312	A	0.361	A	0.364	A	0.003	No	--	--
		PM	0.345	A	0.426	A	0.429	A	0.003	No	--	--
17. Cabrillo Park Drive at Xerox Centre Access Road	D	AM	0.274	A	0.365	A	0.368	A	0.003	No	--	--
		PM	0.312	A	0.423	A	0.410	A	-0.013	No	--	--
18. Cabrillo Park Drive at 17 th Street	D	AM	0.575	A	0.702	C	0.699	B	-0.003	No	--	--
		PM	0.620	B	0.779	C	0.778	C	-0.001	No	--	--

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

TABLE 8-3 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Minimum Acceptable LOS	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Traffic Conditions		(4) Exceed LOS Thresholds (2) - (1)		(5) Year 2045 Buildout Plus Project Plus Improvements Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Cabrillo Park Drive at Wellington Avenue	D	AM	18.1 s/v	C	26.5 s/v	D	26.7 s/v	D	0.2 s/v	No	--	--
		PM	18.3 s/v	C	25.2 s/v	D	25.0 s/v	C	-0.2 s/v	No	--	--
20. Tustin Avenue at Wellington Avenue	D	AM	0.583	A	0.644	B	0.641	B	-0.003	No	--	--
		PM	0.416	A	0.463	A	0.460	A	-0.003	No	--	--
21. Mabury Street at Fruit Street	D	AM	7.9 s/v	A	8.1 s/v	A	7.9 s/v	A	-0.2 s/v	No	--	--
		PM	7.8 s/v	A	8.0 s/v	A	7.8 s/v	A	-0.2 s/v	No	--	--
22. Cabrillo Park Drive at Fruit Street	D	AM	13.9 s/v	B	17.6 s/v	C	15.5 s/v	C	-2.1 s/v	No	--	--
		PM	12.3 s/v	B	15.6 s/v	C	14.6 s/v	C	-1.0 s/v	No	--	--
23. Park Center Drive at Fruit Street	D	AM	10.3 s/v	B	11.2 s/v	B	11.5 s/v	B	0.3 s/v	No	--	--
		PM	10.5 s/v	B	11.7 s/v	B	12.1 s/v	B	0.4 s/v	No	--	--
24. Tustin Avenue at Fruit Street	D	AM	0.516	A	0.573	A	0.573	A	0.000	No	--	--
		PM	0.452	A	0.505	A	0.503	A	-0.002	No	--	--
25. Cabrillo Park Drive at Park Court Place	D	AM	19.0 s/v	C	0.520	A	0.503	A ²⁰	-0.017	No	--	--
		PM	25.1 s/v	D	0.438	A	0.338	A	-0.050	No	--	--

Note:

- **Bold ICU/LOS or HCM/LOS** values indicate adverse service levels based on the Cities LOS standards.
- s/v = seconds per vehicle (delay)

²⁰ The westbound approach has been conservatively assessed as a shared left/thru/right. If the final design includes an exclusive left turn lane the LOS will be better than reported values

9.0 STATE OF CALIFORNIA (CALTRANS) ANALYSIS

In conformance with the current Caltrans *Guide for the Preparation of Traffic Impact Studies*, dated December 2002, existing and projected peak hour operating conditions at the five (5) state-controlled study intersections within the study area have been evaluated using the *Highway Capacity Manual* operations method of analysis. These state-controlled locations include the following study intersections:

2. I-5 SB On-Ramp at First Street (City of Santa Ana/Caltrans)
7. I-5 SB On-Ramp/Mabury Street at 4th Street (City of Santa Ana/Caltrans)
8. I-5 NB Ramps at 4th Street (City of Santa Ana/Caltrans)
13. SR-55 SB Ramps at 4th Street (City of Santa Ana/Caltrans)
14. SR-55 NB Ramps at 4th Street (City of Tustin/Caltrans)

Caltrans “endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities”; it does not require that LOS “D” (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. For this analysis, LOS D is the target level of service standard and will be utilized to assess the project impacts at the state-controlled study intersections.

The Caltrans *Guide for the Preparation of Traffic Impact Studies*, dated December 2002 states that if an existing State-owned facility operates at less than the target LOS (i.e. LOS D); the existing service level should be maintained. Based on Caltrans Criteria, a Project’s impact is considered significant if the Project causes the LOS to change from an acceptable LOS (i.e., LOS D or better) to a deficient LOS (i.e. LOS E or F).

9.1 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)

Based on the HCM 6th Edition operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents and when there are no other vehicles on the road.

In the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in **Table 9-1**.

TABLE 9-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM)²¹

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays. This level is considered by many agencies (i.e. SANBAG) to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

²¹ Source: *Highway Capacity Manual* (Signalized Intersections).

9.2 Existing Plus Project Traffic Conditions

Table 9-2 summarizes the peak hour Level of Service results at the five (5) state-controlled study intersections for existing plus project traffic conditions. The first column (1) of HCM/LOS values in *Table 9-2* presents a summary of existing AM and PM peak hour traffic. The second column (2) lists existing plus project traffic conditions with current intersection geometry/lane configurations. The third column (3) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will level of service thresholds defined in this report. The fourth column (4) indicates the anticipated level of service with improvements, if any.

9.2.1 Existing Traffic Conditions

Review of column (1) of *Table 9-2* indicates that the intersection of SR-55 SB Ramps/4th Street currently operates at unacceptable LOS F in the AM peak hour. The remaining state-controlled study intersections currently operate at LOS C or better during the weekday AM and PM peak hours.

9.2.2 Existing Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 9-2* indicates that the intersection of SR-55 SB Ramps/4th Street will continue to operate at unacceptable LOS F in the AM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours, with the addition of project traffic.

Review of column (4) of *Table 9-2* indicates that the implementation of recommended improvements at the intersection of SR-55 SB Ramps/4th Street will help offset the Project's increment. Recommended improvements are discussed in Section 12.0.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Existing Plus Project traffic conditions. **Table 9-3** presents the queueing results for the Caltrans study intersection ramps.

Appendix E presents the existing plus project HCM/LOS calculations for the state-controlled study intersections.

TABLE 9-2
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY – CALTRANS

Key Intersection	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Exceed LOS Thresholds (2) – (1)		(4) Existing Plus Project Traffic Conditions with Improvements	
		HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
2. I-5 SB On Ramp at First Street	AM	7.2 s/v	A	7.2 s/v	A	0.0 s/v	No	--	--
	PM	7.3 s/v	A	6.9 s/v	A	-0.4 s/v	No	--	--
7. I-5 SB On Ramp/Mabury Street at 4 th street	AM	26.3 s/v	C	26.6 s/v	C	0.3 s/v	No	--	--
	PM	29.0 s/v	C	28.7 s/v	C	-0.3 s/v	No	--	--
8. I-5 NB Ramps at 4 th Street	AM	6.8 s/v	A	6.9 s/v	A	0.1 s/v	No	--	--
	PM	26.6 s/v	C	24.1 s/v	C	-2.5 s/v	No	--	--
13. SR-55 SB Ramps at 4 th Street	AM	151.8 s/v	F	158.0 s/v	F	6.2 s/v	No	27.2 s/v	C ²²
	PM	27.5 s/v	C	27.1 s/v	C	-0.4 s/v	No	24.9 s/v	C
14. SR-55 NB Ramps at 4 th Street	AM	25.1 s/v	C	25.4 s/v	C	0.3 s/v	No	--	--
	PM	18.9 s/v	B	18.2 s/v	B	-0.7 s/v	No	--	--

Note:

- **Bold HCM/LOS** values indicate adverse service levels based on the Caltrans LOS standards.
- s/v = seconds per vehicle (delay)

²² Although the intersection is not considered a significant impact based on Caltrans criteria, level of service results at the intersection with the implementation of improvements discussed in Section 11.0 have been included for informational purposes.

TABLE 9-3
EXISTING PLUS PROJECT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS²³

Key Study Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)
7. I-5 SB On Ramp/Mabury Street at 4 th street									
<i>Southbound Left - Turn</i>	288' ²⁴	40'	Yes	37'	Yes	37'	Yes	41'	Yes
<i>Southbound Through</i>	970'	65'	Yes	50'	Yes	67'	Yes	51'	Yes
<i>Southbound Shared Through/Right-Turn</i>	970'	63'	Yes	47'	Yes	65'	Yes	48'	Yes
8. I-5 NB Ramps at 4 th Street									
<i>Northbound Left-Turn</i>	360'	47'	Yes	118'	Yes	49'	Yes	118'	Yes
13. SR-55 SB Ramps at 4 th Street									
<i>Southbound Left - Turn</i>	1,400'	36'	Yes	223'	Yes	28'	Yes	223'	Yes
<i>Southbound Shared Left/Right-Turn</i>	1,400'	35'	Yes	221'	Yes	27'	Yes	222'	Yes
<i>Southbound Right-Turn</i>	165'	34'	Yes	214'	Yes ²⁵	27'	Yes	215'	Yes ²⁵

²³ Queues are based on HCM 95th Percentile methodology.

²⁴ The southbound left-turn consists of dual lanes. The first lane consists of approximately 140 feet of storage and the second lane consists of approximately 435 feet of storage. The storage reported is the average of both lanes.

²⁵ Although the queue exceeds the right-turn storage, the ramp has the capacity to accommodate the additional spillover queue.

TABLE 9-3 (CONTINUED)
EXISTING PLUS PROJECT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS²⁶

Key Study Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
14. SR-55 NB Ramps at 4 th Street									
<i>Northbound Left - Turn</i>	1,200'	172'	Yes	136'	Yes	170'	Yes	135'	Yes
<i>Northbound Shared Through/Left/Right-Turn</i>	1,200'	167'	Yes	129'	Yes	165'	Yes	129'	Yes
<i>Northbound Right-Turn</i>	700'	163'	Yes	123'	Yes	161'	Yes	122'	Yes

²⁶ Queues are based on HCM 95th Percentile methodology.

9.3 Year 2026 Traffic Conditions

Table 9-4 summarizes the peak hour Level of Service results at the at the five (5) state-controlled study intersections for the Year 2026 horizon year. The first column (1) of HCM/LOS values in *Table 9-4* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2026 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic), without any traffic generated by the proposed Project. The third column (3) presents future forecast traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will level of service thresholds defined in this report. The fifth column (5) indicates the anticipated level of service with improvements, if any.

9.3.1 Year 2026 Cumulative Traffic Conditions

Review of Column (2) of *Table 9-4* indicates that the intersection of SR-55 SB Ramps/4th Street is forecast to operate at unacceptable LOS F in the AM peak hour. The remaining state-controlled study intersections are forecast to operate at LOS D or better during the weekday AM and PM peak hours.

9.3.2 Year 2026 Cumulative Plus Project Traffic Conditions

Review of columns (3) and (4) of *Table 9-4* indicates that the intersection of SR-55 SB Ramps/4th Street will continue to operate at unacceptable LOS F in the AM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours, with the addition of project traffic.

Review of column (4) of *Table 9-4* indicates that the implementation of recommended improvements at the intersection of SR-55 SB Ramps/4th Street will help offset the Project's increment. Recommended improvements are discussed in Section 12.0.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Year 2026 Plus Project traffic conditions. **Table 9-5** presents the queueing results for the Caltrans study intersection ramps.

Appendix E presents the Year 2026 HCM/LOS calculations for the state-controlled study intersections.

TABLE 9-4
YEAR 2026 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY – CALTRANS

Key Intersection	Time Period	(1) Year 2026 Cumulative Traffic Conditions		(2) Year 2026 Cumulative Plus Project Traffic Conditions		(3) Exceeds LOS Thresholds (2) – (1)		(4) Year 2026 Cumulative Plus Project Traffic Conditions with Improvements	
		HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
2. I-5 SB On Ramp at First Street	AM	8.5 s/v	A	8.5 s/v	A	0.0 s/v	No	--	--
	PM	8.8 s/v	A	8.4 s/v	A	-0.4 s/v	No	--	--
7. I-5 SB On Ramp/Mabury Street at 4 th street	AM	26.6 s/v	C	26.7 s/v	C	0.1 s/v	No	--	--
	PM	27.4 s/v	C	27.0 s/v	C	-0.4 s/v	No	--	--
8. I-5 NB Ramps at 4 th Street	AM	6.9 s/v	A	7.0 s/v	A	0.1 s/v	No	--	--
	PM	8.8 s/v	A	8.8 s/v	A	0.0 s/v	No	--	--
13. SR-55 SB Ramps at 4 th Street	AM	176.4 s/v	F	182.3 s/v	F	5.9 s/v	No	25.0 s/v	C ²⁷
	PM	36.2 s/v	D	34.9 s/v	C	-1.3 s/v	No	26.5 s/v	C
14. SR-55 NB Ramps at 4 th Street	AM	45.1 s/v	D	45.4 s/v	D	0.3 s/v	No	--	--
	PM	36.1 s/v	D	34.5 s/v	C	-1.6 s/v	No	--	--

Note:

- **Bold HCM/LOS** values indicate adverse service levels based on the Caltrans LOS standards.
- s/v = seconds per vehicle (delay)

²⁷ Although the intersection is not considered a significant impact based on Caltrans criteria, level of service results at the intersection with the implementation of improvements discussed in Section 12.0 have been included for informational purposes.

TABLE 9-5
YEAR 2026 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS²⁸

Key Study Intersection	Storage Provided (feet)	(1) Year 2026 Cumulative Traffic Conditions				(2) Year 2026 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)
7. I-5 SB On Ramp/Mabury Street at 4 th street									
<i>Southbound Left -Turn</i>	288' ²⁹	58'	Yes	76'	Yes	55'	Yes	82'	Yes
<i>Southbound Through</i>	970'	85'	Yes	82'	Yes	89'	Yes	85'	Yes
<i>Southbound Shared Through/Right-Turn</i>	970'	81'	Yes	76'	Yes	84'	Yes	79'	Yes
8. I 5 NB Ramps at 4 th Street									
<i>Northbound Left-Turn</i>	360'	49'	Yes	101'	Yes	51'	Yes	100'	Yes
13. SR-55 SB Ramps at 4 th Street									
<i>Southbound Left -Turn</i>	1,400'	58'	Yes	283'	Yes	49'	Yes	286'	Yes
<i>Southbound Shared Left/Right-Turn</i>	1,400'	54'	Yes	289'	Yes	46'	Yes	292'	Yes
<i>Southbound Right-Turn</i>	165'	54'	Yes	301'	Yes ³⁰	46'	Yes	304'	Yes ³⁰

²⁸ Queues are based on HCM 95th Percentile methodology.

²⁹ The southbound left-turn consists of dual lanes. The first lane consists of approximately 140 feet of storage and the second lane consists of approximately 435 feet of storage. The storage reported is the average of both lanes.

³⁰ Although the queue exceeds the right-turn storage, the ramp has the capacity to accommodate the additional spillover queue.

TABLE 9-5 (CONTINUED)
YEAR 2026 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS³¹

Key Study Intersection	Storage Provided (feet)	(1) Year 2026 Cumulative Traffic Conditions				(2) Year 2026 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
14. SR-55 NB Ramps at 4 th Street									
Northbound Left - Turn	1,200'	212'	Yes	194'	Yes	210'	Yes	193'	Yes
Northbound Shared Through/Left/Right - Turn	1,200'	211'	Yes	190'	Yes	209'	Yes	190'	Yes
Northbound Right - Turn	700'	210'	Yes	182'	Yes	207'	Yes	181'	Yes

³¹ Queues are based on HCM 95th Percentile methodology.

9.4 Year 2045 Traffic Conditions

Table 9-6 summarizes the peak hour Level of Service results at the at the five (5) state-controlled study intersections for the Year 2045 buildout year. The first column (1) of HCM/LOS values in *Table 9-6* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2045 buildout traffic conditions, without any traffic generated by the proposed Project. The third column (3) presents future forecast traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will level of service thresholds defined in this report. The fifth column (5) indicates the anticipated level of service with improvements, if any.

9.4.1 Year 2045 Buildout Traffic Conditions

Review of Column (2) of *Table 9-6* indicates that the intersections of SR-55 SB Ramps/4th Street and SR-55 NB Ramps/4th Street are forecast to operate at unacceptable LOS E and/or F in the AM and/or PM peak hour. The remaining state-controlled study intersections are forecast to operate at LOS D or better during the weekday AM and PM peak hours.

9.4.2 Year 2045 Buildout Plus Project Traffic Conditions

Review of columns (3) and (4) of *Table 9-6* indicates that the intersections of SR-55 SB Ramps/4th Street and SR-55 NB Ramps/4th Street will continue to operate at unacceptable LOS E and/or F in the AM and/or PM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours, with the addition of project traffic.

Review of column (4) of *Table 9-6* indicates that the implementation of recommended improvements at the two (2) intersections of SR-55 SB Ramps/4th Street and SR-55 NB Ramps/4th Street will help offset the Project's increment. Recommended improvements are discussed in Section 12.0.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Year 2045 Buildout Plus Project traffic conditions. **Table 9-7** presents the queueing results for the Caltrans study intersection ramps.

Appendix E presents the Year 2045 HCM/LOS calculations for the state-controlled study intersections.

TABLE 9-6
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY – CALTRANS

Key Intersection	Time Period	(1) Year 2045 Buildout Traffic Conditions		(2) Year 2045 Buildout Plus Project Traffic Conditions		(3) Exceeds LOS Thresholds (2) – (1)		(4) Year 2045 Buildout Plus Project Traffic Conditions with Improvements	
		HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
2. I-5 SB On Ramp at First Street	AM	8.7 s/v	A	8.9 s/v	A	0.2 s/v	No	--	--
	PM	9.4 s/v	A	9.0 s/v	A	-0.4 s/v	No	--	--
7. I-5 SB On Ramp/Mabury Street at 4 th street	AM	26.5 s/v	C	26.5 s/v	C	0.2 s/v	No	--	--
	PM	27.1 s/v	C	26.8 s/v	C	-0.3 s/v	No	--	--
8. I-5 NB Ramps at 4 th Street	AM	8.6 s/v	A	8.6 s/v	A	0.0 s/v	No	--	--
	PM	11.0 s/v	B	10.9 s/v	B	-0.1 s/v	No	--	--
13. SR-55 SB Ramps at 4 th Street	AM	184.6 s/v	F	190.4 s/v	F	5.8 s/v	No	24.4 s/v	C ³²
	PM	40.8 s/v	D	38.9 s/v	D	-1.9 s/v	No	28.1 s/v	C
14. SR-55 NB Ramps at 4 th Street	AM	58.5 s/v	E	57.8 s/v	E	-0.7 s/v	No	36.9 s/v	D ³²
	PM	57.3 s/v	E	54.7 s/v	D	-2.6 s/v	No	26.8 s/v	C

Note:

- **Bold HCM/LOS** values indicate adverse service levels based on the Caltrans LOS standards.
- s/v = seconds per vehicle (delay)

³² Although the intersection is not considered a significant impact based on Caltrans criteria, level of service results at the intersection with the implementation of improvements discussed in Section 12.0 have been included for informational purposes.

TABLE 9-7
YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS³³

Key Study Intersection	Storage Provided (feet)	(1) Year 2045 Buildout Traffic Conditions				(2) Year 2045 Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes/No)
7. I-5 SB On Ramp/Mabury Street at 4 th street									
<i>Southbound Left -Turn</i>	288' ³⁴	64'	Yes	83'	Yes	61'	Yes	90'	Yes
<i>Southbound Through</i>	970'	94'	Yes	90'	Yes	98'	Yes	93'	Yes
<i>Southbound Shared Through/Right-Turn</i>	970'	89'	Yes	84'	Yes	93'	Yes	87'	Yes
8. I 5 NB Ramps at 4 th Street									
<i>Northbound Left-Turn</i>	360'	85'	Yes	159'	Yes	88'	Yes	158'	Yes
13. SR-55 SB Ramps at 4 th Street									
<i>Southbound Left -Turn</i>	1,400'	71'	Yes	308'	Yes	61'	Yes	312'	Yes
<i>Southbound Shared Left/Right-Turn</i>	1,400'	67'	Yes	317'	Yes	59'	Yes	320'	Yes
<i>Southbound Right-Turn</i>	165'	66'	Yes	334'	Yes ³⁵	57'	Yes	338'	Yes ³⁵

³³ Queues are based on HCM 95th Percentile methodology.

³⁴ The southbound left-turn consists of dual lanes. The first lane consists of approximately 140 feet of storage and the second lane consists of approximately 435 feet of storage. The storage reported is the average of both lanes.

³⁵ Although the queue exceeds the right-turn storage, the ramp has the capacity to accommodate the additional spillover queue.

TABLE 9-7 (CONTINUED)
YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS³⁶

Key Study Intersection	Storage Provided (feet)	(1) Year 2045 Buildout Traffic Conditions				(2) Year 2045 Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
14. SR-55 NB Ramps at 4 th Street									
Northbound Left - Turn	1,200'	224'	Yes	205'	Yes	223'	Yes	204'	Yes
Northbound Shared Through/Left/Right-Turn	1,200'	226'	Yes	202'	Yes	224'	Yes	201'	Yes
Northbound Right-Turn	700'	228'	Yes	196'	Yes	225'	Yes	195'	Yes

³⁶ Queues are based on HCM 95th Percentile methodology.

10.0 DAILY ROADWAY SEGMENT ANALYSIS

10.1 Existing Plus Project Analysis

Table 10-1 summarizes the daily Level of Service results at the twelve (12) key study intersections for existing plus project traffic conditions. The first column (1) in *Table 10-1* presents a daily volumes and subsequent LOS based on the MPAH for existing conditions. The second column (2) presents a daily volumes and subsequent LOS based on the MPAH for existing plus project conditions. The third column (3) identifies if the daily roadway segment exceeds the thresholds identified within this report.

10.1.1 Existing Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 10-1* indicates that all twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to existing traffic.

TABLE 10-1
EXISTING DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1)		(2)		(3)
					Existing Traffic Conditions		Existing Plus Project Traffic Conditions		Exceeds LOS Threshold
					Daily Volume	LOS	Daily Volume	LOS	Yes/No
A. First Street, between I-5 SB On-Ramp/Marbury Street and Cabrillo Park Drive	Santa Ana	D	Major	6	26,442	A	26,374	A	No
B. First Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	22,110	A	22,136	A	No
C. First Street, between Golden Circle Drive and Tustin Avenue	Santa Ana	D	Major	6	20,088	A	20,144	A	No
D. Cabrillo Park Drive, between Xerox Centre Access Road and State Fund Access Road	Santa Ana	D	Primary	4	12,143	A	12,100	A	No
E. Fourth Street, between I-5 NB Ramps and Cabrillo Park Drive	Santa Ana	D	Major	6	30,042	A	30,634	A	No
F. Fourth Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	22,635	A	23,045	A	No
G. Tustin Avenue, between First Street and Fourth Street	Santa Ana/ Tustin	D	Major	5	16,887	A	16,904	A	No
H. Tustin Avenue, between Fourth Street and Sixth Street	Santa Ana	D	Major	6	24,911	A	25,099	A	No
I. Cabrillo Park Drive, between Fourth Street and Parkcourt Place	Santa Ana	D	Primary	4	13,624	A	13,741	A	No

TABLE 10-1 (CONTINUED)
EXISTING PLUS PROJECT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Exceeds LOS Threshold	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	
J. Cabrillo Park Drive, between Parkcourt Place and Fruit Street	Santa Ana	D	Primary	4	10,932	A	11,384	A	No	
K. Cabrillo Park Drive, between Fruit Street and 17th Street	Santa Ana	D	Primary	4	9,812	A	9,976	A	No	
L. Parkcourt Place, between Cabrillo Park Drive and Fruit Street	Santa Ana	D	Commuter Street	2	1,825	A	1,934	A	No	

10.2 Year 2026 Traffic Conditions

Table 10-2 summarizes the daily Level of Service results at the twelve (12) key study intersections for existing plus project traffic conditions. The first column (1) in *Table 10-2* presents a daily volumes and subsequent LOS based on the MPAH for Year 2026 conditions. The second column (2) presents a daily volumes and subsequent LOS based on the MPAH for Year 2026 plus project conditions. The third column (3) identifies if the daily roadway segment exceeds the thresholds identified within this report.

10.2.1 Year 2026 Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 10-2* indicates that all twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to Year 2026 traffic.

TABLE 10-2
YEAR 2026 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2026 Cumulative Traffic Conditions		(2) Year 2026 Cumulative Plus Project Traffic Conditions		(3) Exceeds LOS Threshold
					Daily Volume	LOS	Daily Volume	LOS	Yes/No
A. First Street, between I-5 SB On-Ramp/Marbury Street and Cabrillo Park Drive	Santa Ana	D	Major	6	32,933	A	32,865	A	No
B. First Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	29,723	A	29,749	A	No
C. First Street, between Golden Circle Drive and Tustin Avenue	Santa Ana	D	Major	6	27,128	A	27,154	A	No
D. Cabrillo Park Drive, between Xerox Centre Access Road and State Fund Access Road	Santa Ana	D	Primary	4	17,859	A	17,816	A	No
E. Fourth Street, between I-5 NB Ramps and Cabrillo Park Drive	Santa Ana	D	Major	6	41,106	C	41,698	C	No
F. Fourth Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	30,411	A	30,821	A	No
G. Tustin Avenue, between First Street and Fourth Street	Santa Ana/ Tustin	D	Major	5	21,554	A	21,571	A	No
H. Tustin Avenue, between Fourth Street and Sixth Street	Santa Ana	D	Major	6	27,075	A	27,263	A	No
I. Cabrillo Park Drive, between Fourth Street and Parkcourt Place	Santa Ana	D	Primary	4	16,983	A	17,100	A	No

TABLE 10-2 (CONTINUED)
YEAR 2026 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2026 Cumulative Traffic Conditions		(2) Year 2026 Cumulative Plus Project Traffic Conditions		(3) Exceeds LOS Threshold	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	
J. Cabrillo Park Drive, between Parkcourt Place and Fruit Street	Santa Ana	D	Primary	4	13,422	A	13,874	A	No	
K. Cabrillo Park Drive, between Fruit Street and 17th Street	Santa Ana	D	Primary	4	12,009	A	12,173	A	No	
L. Parkcourt Place, between Cabrillo Park Drive and Fruit Street	Santa Ana	D	Commuter Street	2	3,876	A	3,985	A	No	

10.3 Year 2045 Traffic Conditions

Table 10-3 summarizes the daily Level of Service results at the twelve (12) key study intersections for existing plus project traffic conditions. The first column (1) in *Table 10-3* presents a daily volumes and subsequent LOS based on the MPAH for Year 2045 traffic conditions. The second column (2) presents a daily volumes and subsequent LOS based on the MPAH for Year 2045 plus project conditions. The third column (3) identifies if the daily roadway segment exceeds the thresholds identified within this report.

10.3.1 Year 2045 Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 10-3* indicates that all twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to Year 2045 traffic.

TABLE 10-3
YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2045 Buildout Traffic Conditions		(2) Year 2045 Buildout Plus Project Traffic Conditions		(3) Exceeds LOS Threshold
					Daily Volume	LOS	Daily Volume	LOS	Yes/No
A. First Street, between I-5 SB On-Ramp/Marbury Street and Cabrillo Park Drive	Santa Ana	D	Major	6	34,580	B	34,512	B	No
B. First Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	31,209	A	31,235	A	No
C. First Street, between Golden Circle Drive and Tustin Avenue	Santa Ana	D	Major	6	28,484	A	28,510	A	No
D. Cabrillo Park Drive, between Xerox Centre Access Road and State Fund Access Road	Santa Ana	D	Primary	4	18,752	A	18,709	A	No
E. Fourth Street, between I-5 NB Ramps and Cabrillo Park Drive	Santa Ana	D	Major	6	43,161	C	43,753	C	No
F. Fourth Street, between Cabrillo Park Drive and Golden Circle Drive	Santa Ana	D	Major	6	31,932	A	32,342	A	No
G. Tustin Avenue, between First Street and Fourth Street	Santa Ana/ Tustin	D	Major	5	22,632	A	22,649	A	No
H. Tustin Avenue, between Fourth Street and Sixth Street	Santa Ana	D	Major	6	28,429	A	28,617	A	No
I. Cabrillo Park Drive, between Fourth Street and Parkcourt Place	Santa Ana	D	Primary	4	17,832	A	17,949	A	No

TABLE 10-3 (CONTINUED)
YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1)		(2)		(3)	
					Year 2045 Buildout Traffic Conditions		Year 2045 Buildout Plus Project Traffic Conditions		Exceeds LOS Threshold	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	
J. Cabrillo Park Drive, between Parkcourt Place and Fruit Street	Santa Ana	D	Primary	4	14,093	A	14,545	A	No	
K. Cabrillo Park Drive, between Fruit Street and 17th Street	Santa Ana	D	Primary	4	12,609	A	12,773	A	No	
L. Parkcourt Place, between Cabrillo Park Drive and Fruit Street	Santa Ana	D	Commuter Street	2	4,070	A	4,179	A	No	

11.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

11.1 Site Access

Vehicular access to Site A's parking structures will be provided from a right-turn in/out driveway on Cabrillo Park Drive (Driveway 1) and a right-turn in/out driveway on Fourth Street (Driveway 2), whereas access to Site B will be provided via a driveway located opposite Park Court Place at Cabrillo Park Drive; cross vehicular access is not proposed between the two Project sites or with the adjacent commercial property to the east.

Table 11-1 summarizes the intersection level of service results for the two (2) right-turn in/out Project driveways under long-term (Year 2045) traffic conditions at completion and full occupancy of the proposed Project. As shown, these key study intersections are forecast to operate at LOS C or better during the AM peak hour and PM peak hour.

Appendix F presents the Year 2045 HCM/LOS calculations for the two (2) Project driveways.

11.1.1 Gap Assessment

To supplement the level of service analysis, a gap analysis has been completed to determine if the existing gaps along both Cabrillo Park Drive and 4th Street are considered adequate to accommodate ingress and egress at the proposed project driveways. For the purposes of this study, it is assumed that the minimum time for one vehicle to safely complete the outbound right-turn movement is 7 seconds.

Table 11-2 presents a summary of the gap survey performed in July 2022 for the right-turn outbound movement at the two (2) project driveways. Review of **Table 11-2** shows that there are more gaps than vehicles exiting, therefore, it can be concluded that vehicles will have adequate gaps along both Cabrillo Park Drive and 4th Street when exiting the project site.

TABLE 11-1
PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Intersection Control	Time Period	(1) Year 2045 Buildout Plus Project Traffic Conditions	
			HCM	LOS
A. Cabrillo Park Drive at Project Driveway 1	One-Way Stop	AM	10.0 s/v	B
		PM	11.9 s/v	B
B. Project Driveway 2 at 4 th Street	One-Way Stop	AM	14.9 s/v	B
		PM	21.6 s/v	C

Notes:

- s/v = seconds per vehicle (delay)

TABLE 11-2
RIGHT-TURN OUT VEHICLE GAP ANALYSIS

Gap ³⁷ (seconds)	Driveway 1 (Cabrillo Park Drive)						Driveway 2 (4th Street)					
	AM Peak Hour (7AM – 8AM)			PM Peak Hour (5PM – 6PM)			AM Peak Hour (7AM – 8AM)			PM Peak Hour (5PM – 6PM)		
	Vehicles Served by Gap ³⁸	Gaps Occurring During Peak Hour ³⁹	Total Vehicles Served ⁴⁰	Vehicles Served by Gap ³⁸	Gaps Occurring During Peak Hour ³⁹	Total Vehicles Served ⁴⁰	Vehicles Served by Gap ³⁸	Gaps Occurring During Peak Hour ³⁹	Total Vehicles Served ⁴⁰	Vehicles Served by Gap ³⁸	Gaps Occurring During Peak Hour ³⁹	Total Vehicles Served ⁴⁰
7-13	1	14	14	1	33	33	1	48	48	1	18	36
14-20	2	10	20	2	20	40	2	28	56	2	13	26
21-27	3	7	21	3	12	36	3	19	57	3	10	30
≥ 28	4	46	184	4	26	104	4	42	168	4	38	152
	Total Accommodated Vehicles		239	Total Accommodated Vehicles		213	Total Accommodated Vehicles		329	Total Accommodated Vehicles		244

³⁷ A gap is defined as the time interval between cars crossing the Project driveway.

³⁸ For purposes of this study, it is assumed the minimum time for one vehicle to safely complete a turning movement into the Project driveway is 7 seconds.

³⁹ Values are based on gap survey performed on Thursday, July 21, 2022.

⁴⁰ Total Vehicles Served = (Number of Vehicles Served) x (Number of Gaps During Peak Hour)

11.2 Internal Circulation Evaluation

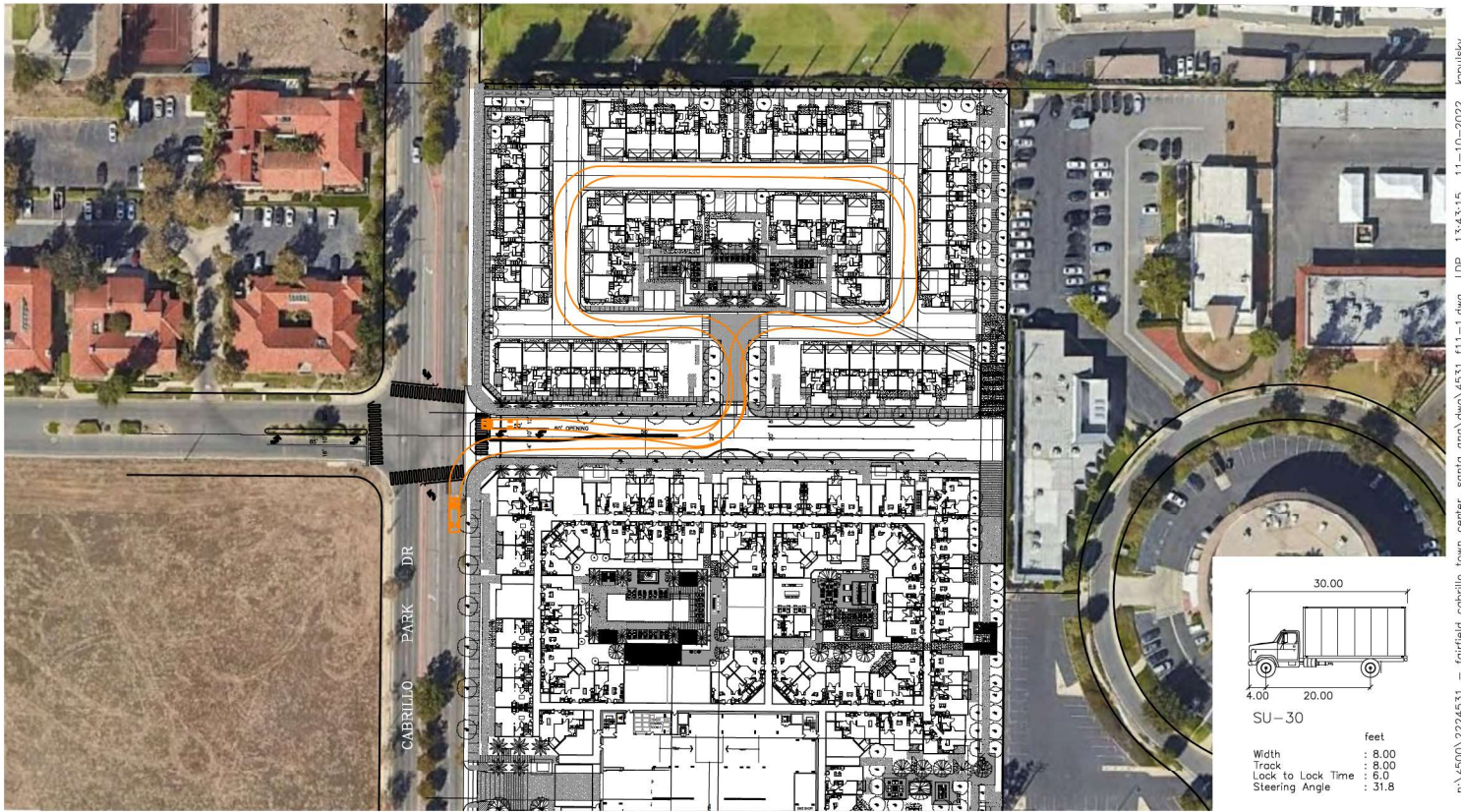
Access to Site B will be provided via a driveway located opposite Park Court Place at Cabrillo Park Drive. Access for small service/delivery trucks (i.e. UPS, FedEx, and trash trucks) and passenger vehicles for the Project site have been evaluated. Our evaluation of the on-site circulation shown on the Project site plan was performed using the *Turning Vehicle Templates*, developed by Jack E. Leisch & Associates and *AutoTURN for AutoCAD* computer software that simulates turning maneuvers for various types of vehicles. **Figure 11-1** illustrates the turning movements required of a small delivery truck (SU-30) as it accesses the site from Cabrillo Park Drive via Park Court Place. Review of *Figure 11-1* shows overall the turning movements are considered adequate.

11.3 Sight Distance Evaluation

At intersections and/or project driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. A sight distance evaluation has been performed for both project driveways located along Cabrillo Park Drive and 4th Street.

The Sight Distance Evaluation prepared for the project driveways are based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual (HDM)*. Corner sight distance was utilized for the evaluation. Corner sight distance is defined in the Caltrans HDM to be the distance required by the driver of a vehicle, traveling at a given speed, to maneuver their vehicle and avoid an object without radically altering their speed. Line of sight for corner sight distance is to be determined from a 3½ foot height at the location of the driver of a vehicle on a minor road to a 4¼ foot object height in the center of the approaching lane of the major road. Based on the criteria set forth in Table 405.1A of the Caltrans HDM and a posted speed limit of 35 mph on Cabrillo Park Drive, a corner sight distance of 334 feet for right-turning vehicles is required for Project Driveway 1. Based on the criteria set forth in Table 405.1A of the Caltrans HDM and a posted speed limit of 40 mph on 4th Street, a corner sight distance of 382 feet is required for right-turning vehicles at Project Driveway 2.

Figures 11-2 presents the result of the sight distance evaluation for right-turning vehicles at Project Driveway 1 based on the application of the corner sight distance criteria. This figure illustrates the limited use areas. As shown, the sight lines at the proposed Project driveway are expected to be adequate as long as obstructions within the sight triangles are minimized. **Figure 11-3** present the results of the sight distance evaluation for right-turning vehicles at Project Driveway 2 based on the application of the corner sight distance criteria. The figure illustrates the limited use areas. As shown, the sight lines at the proposed Project driveway are expected to be adequate as long as obstructions within the sight triangles are minimized.



n:\4500\2224531 - fairfield cabrillo town center, santa ana.dwg 4531 f11-1.dwg LDP 13:43:15 11-10-2022 kopulsky

SOURCE: ARCHITECTS ORANGE

FIGURE 11-1

SU-30 TRUCK TURNING ANALYSIS
CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA




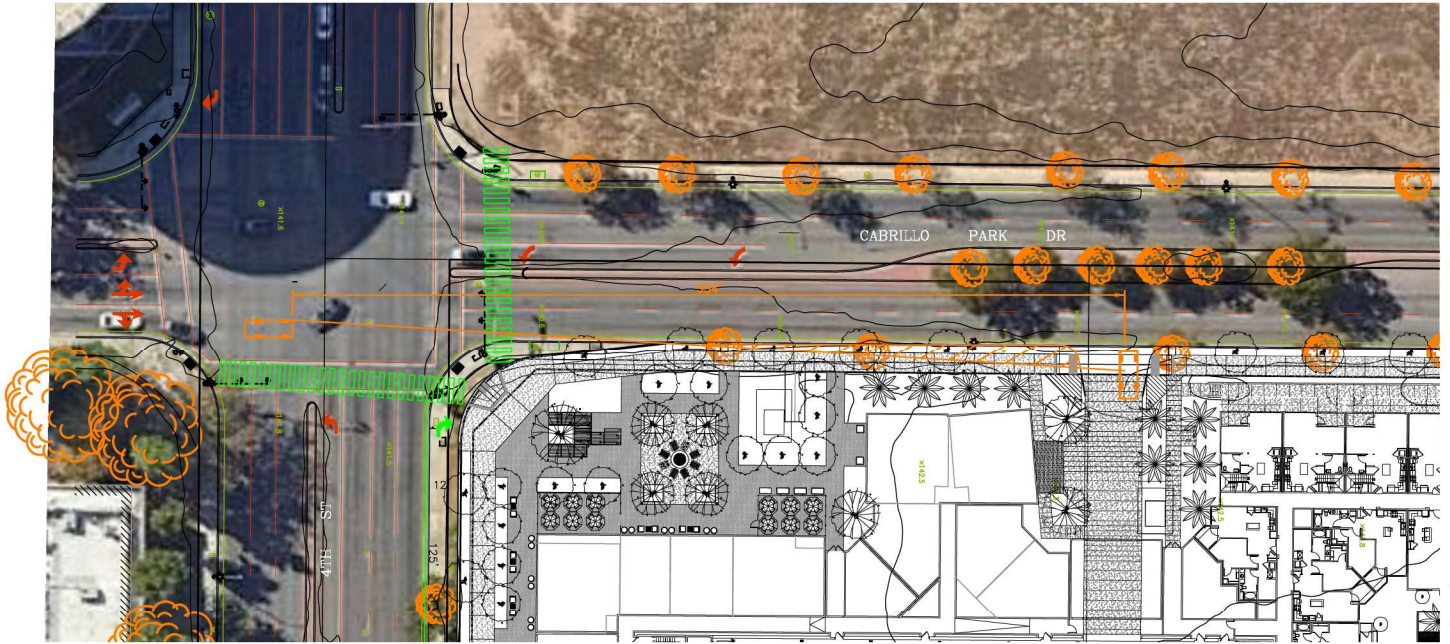
NO SCALE

CORNER SIGHT DISTANCE

DESIGN SPEED LIMIT: 35 MPH
 REQUIRED STOPPING
 SIGHT DISTANCE
 LOOKING LEFT: 334 FEET

LEGEND

 PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO
 ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE
 AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN
 30 INCHES ABOVE THE CURB/SIDEWALK, NO
 FENCES OR WALLS IN LIMITED USE AREA



SOURCE: ARCHITECTS ORANGE

FIGURE 11-2

PROJECT DRIVEWAY 1 SIGHT DISTANCE
 ANALYSIS FOR RIGHT-TURNING VEHICLES
 CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA




NO SCALE

CORNER SIGHT DISTANCE

DESIGN SPEED LIMIT: 40 MPH
 REQUIRED STOPPING
 SIGHT DISTANCE
 LOOKING LEFT: 382 FEET

LEGEND

 PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO
 ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE
 AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN
 30 INCHES ABOVE THE CURB/SIDEWALK, NO
 FENCES OR WALLS IN LIMITED USE AREA



SOURCE: ARCHITECTS ORANGE

FIGURE 11-3

PROJECT DRIVEWAY 2 SIGHT DISTANCE
 ANALYSIS FOR RIGHT-TURNING VEHICLES
 CABRILLO TOWN CENTER MIXED-USE PROJECT, SANTA ANA



NO SCALE

12.0 RECOMMENDED INTERSECTION IMPROVEMENTS

For those intersections where projected traffic volumes are expected to result in unacceptable operating conditions, this report recommends (identifies) improvement measures that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) to specific approaches of a key intersection. The identified improvements are expected to:

- improve existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative project) traffic and
- improve Levels of Service to an acceptable range and/or to pre-project conditions.

12.1 Planned Improvements

The following improvements are anticipated to be implemented as part of the Central Pointe Project. As such, the following intersection improvements are planned.

- **No. 8 – I-5 NB Ramps at Fourth Street:** Construct an additional westbound right-turn lane. Modify the existing traffic signal as necessary, inclusive any modifications to the traffic signal phasing.
- **No. 9 – Cabrillo Park Drive at Fourth Street:** Construct an exclusive southbound right-turn lane. Modify the existing traffic signal as necessary. This improvement, which has been incorporated in the Central Pointe Project site plan as a “design feature” is subject to the review and approval of the City of Santa Ana.
- **No. 25 – Cabrillo Park Drive at Park Court Place:** Install two-phase traffic signal and implement all necessary signing and striping improvements, inclusive of continental crosswalks and stop bars. This improvement is subject to the review and approval of the City of Santa Ana.

It is noted that the proposed Project will also be responsible for the new traffic signal on Cabrillo Park Drive at Park Court Place, inclusive improvements to Project Driveway 2 to accommodate anticipated traffic signal and signing and striping associated the construction of this access.

12.2 Recommended Improvements

12.2.1 Existing Plus Project Traffic Conditions

The results of the intersection capacity analyses summarized in *Tables 8-1 and 9-2* indicates that Project-related improvements necessary at one (1) study intersections under Existing Plus Project traffic conditions are as follows:

- **No. 13 – SR-55 SB Ramps at Fourth Street:** Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary.

This improvement is subject to the review and approval of the City of Santa Ana and Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, City of Santa Ana, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

It should be noted that although the intersection of Cabrillo Park Drive at Fourth Street is forecast to operate at acceptable service levels under Existing Plus Project traffic conditions, the intersection requires improvements under future traffic conditions, as noted in Sections 12.2.2 and 12.2.3 of this report. Since the recommended improvement is located within the Project frontage, the Project may be expected to construct the following improvements and/or to paying their "fair-share" cost responsibility:

- **No. 9 – Cabrillo Park Drive at Fourth Street:** Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

12.2.2 Year 2026 Cumulative Plus Project Traffic Conditions

The results of the intersection capacity analyses summarized in *Table 8-2 and 9-3* indicates that Project-related improvements necessary at two (2) study intersections under Year 2026 Plus Project traffic conditions are as follows:

- **No. 9 – Cabrillo Park Drive at Fourth Street:** Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to construct the following improvements and/or pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- **No. 13 – SR-55 SB Ramps at Fourth Street:** Same as those identified in Section 12.2.1 – Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana and Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction

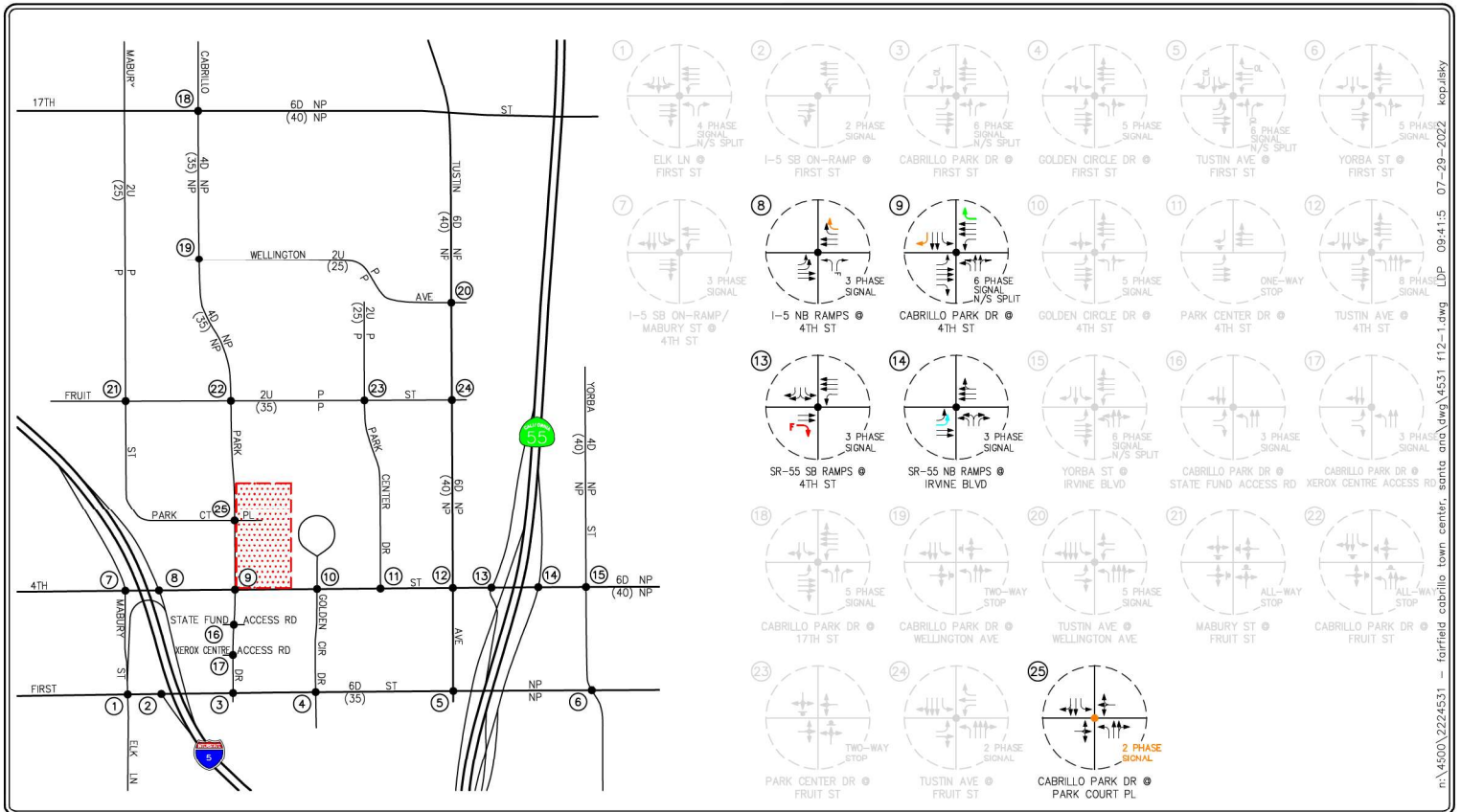
costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

12.2.3 Year 2045 Buildout Plus Project Traffic Conditions

The results of the intersection capacity analyses summarized in *Table 8-3 and 9-4* indicates that Project-related improvements necessary at three (3) study intersections under Year 2045 Plus Project traffic conditions are as follows:

- **No. 9 – Cabrillo Park Drive at Fourth Street:** *Same as those identified in Section 12.2.2 –* Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to construct the following improvements and/or pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- **No. 13 – SR-55 SB Ramps at Fourth Street:** *Same as those identified in Section 12.2.1 –* Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana, City of Tustin and/or Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- **No. 14 – SR-55 NB Ramps at Irvine Boulevard:** Modify the eastbound approach to provide dual left-turn lanes and two through lanes. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana, City of Tustin and/or Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

Figure 12-1 illustrates the planned and recommended improvements at the study intersections.



12.3 Project-Related Fair-Share Contribution

The transportation impacts associated with the development of the Project were determined based on the Existing Plus Project, Year 2026 and Year 2045 Buildout traffic analyses. As summarized in *Tables 8-1, 8-2, 8-3, 9-2, 9-3, and 9-4* the development of the Project is anticipated to have an impact at three (3) locations in which the Project can be expected to pay its fair share of the improvement costs.

Table 12-1 presents the Project's fair-share contribution to construct the recommended improvements at the three (3) study intersections. As presented in *Table 12-1*, the first column (1) lists the recommended improvements at the three (3) impacted locations. The second column (2) presents a total of all intersection peak hour movements for existing conditions. The third column (3) presents Project-related added traffic volumes during AM peak hour and PM peak hour, assuming no credit for trips generated by the site's existing office building to provide a conservative estimated. The fourth column (4) presents Year 2045 Buildout traffic conditions with Project traffic. The fifth column (5) represents what percentage of total added intersection peak hour traffic is Project-related traffic.

Review of *Table 12-1* shows that the proposed Project fair-share cost responsibility at the three (3) study intersections ranges between **3.95%** and **11.98%**, if no credit for trips generated by the site's existing office building is taken into consideration.

TABLE 12-1
YEAR 2045 BUILDOUT PROJECT FAIR-SHARE COST CONTRIBUTION

Key Intersection	City/ Jurisdiction	Time Period	(1) Improvement Description	(2) Existing Traffic	(3) Project Traffic ⁴¹	(4) Year 2045 Buildout Plus Project Traffic	(5) Project Fair-Share Percent ⁴²
9. Cabrillo Park Drive at Fourth Street	Santa Ana	AM PM	▪ Widen to provide a westbound right-turn lane.	-- 3,426	-- 187	-- 4,987	-- 11.98%
13. SR-55 SB Ramps at Fourth Street	Santa Ana/ Caltrans	AM PM	▪ Modify the eastbound shared through/right-turn lane to construct a free-right turn lane.	3,211 --	63 --	4,289 --	5.84% --
14. SR-55 NB Ramps at Fourth Street	Tustin/ Caltrans	AM PM	▪ Modify the eastbound approach to provide dual left-turn lanes and two through lanes.	3,242 --	42 --	4,304 --	3.95% --

⁴¹ Represents added Project-related traffic volumes without credit for the trips generated by the existing office site to calculate the Project's fair-share percentage contribution.

⁴² Project fair-share percentage Column (4) = [Column (2)] / [Column (3) – Column (1)].

13.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- **Project Description** – The Project site is a 8.97±-acre rectangular-shaped parcel of land within the Metro East Mixed Use (MEMU) Overlay Zone that is generally located north of Fourth Street and east of Cabrillo Park Drive in the City of Santa Ana, California. The Project site has an existing zoning of Professional (P) and is identified with a “Village Center District” designation in the MEMU Overlay Zone. The subject property is currently developed with four (4) three-story office buildings with a total floor area of 173,025 square-feet (SF) of floor area and approximately 617 surface parking spaces. Vehicular access to the Project site is currently provided via two (2) right-turn only driveways on Fourth Street, one (1) right-turn only driveway on Cabrillo Park Drive, and a full access driveway located opposite Park Court Place at Cabrillo Park Drive; No cross vehicular access is now provided with the adjacent commercial property to the east.

The proposed Project will include the development of up to 507 residential apartment/townhomes units with a total of 1,028 parking spaces. Site “A” is proposed as five-story apartment podium with up 449 apartment homes consisting of 23 studio units, 264 one-bedroom units, 148 two-bedroom units, and 14 two-bedroom/live-work units, and 5,800 square-feet (SF) of ground floor retail space and 11,400 SF of live/work commercial/office space (estimated at 814 SF per live-work unit) “wrapped” around a six-level parking structure with a total of roughly 898 parking spaces. On-site facilities/amenities for residents of the Site “A” include 6,100 SF of commercial space that would be dedicated to the leasing office, mailroom and co-work space and business center, a lounge/lobby, pool/spa, and a fitness center for residents, and courtyards. Site “B” is proposed as residential townhome community consisting of three-story townhomes with a total of 58 units and parking supply of 127 spaces consisting of garage spaces and surface parking. On-site facilities/amenities of the Site “B” includes open space/courtyards. Although not counted as a part of the Project’s parking supply, an additional 23 on-street parking spaces will be provided on Park Court Place.

Vehicular access to Site A’s parking structures will be provided from a proposed “right-turn in/right-turn out” driveway on Cabrillo Park Drive (Driveway 1) and a proposed “right-turn in/right-turn out” driveway on Fourth Street (Driveway 2), whereas access to Site B will be provided via a “full access” driveway located opposite Park Court Place at Cabrillo Park Drive; No cross vehicular access is proposed between the two Project sites or with the adjacent commercial property to the east.

- **Study Scope** – The following twenty-five (25) key study intersections were selected for detailed peak hour level of service analyses under Existing Traffic Conditions, Existing Plus Project Traffic Conditions, Year 2026 Cumulative Traffic Conditions, Year 2026 Cumulative plus Project, Year 2045 Buildout Traffic Conditions, and Year 2045 Buildout Plus Project Traffic Conditions.

Key Study Intersections

- | | |
|--|--|
| 1. Elk Lane at First Street (Santa Ana) | 14. SR-55 NB Ramps at 4 th Street (Tustin/Caltrans) |
| 2. I-5 SB On-Ramp at First Street (Santa Ana/Caltrans) | 15. Yorba Street at 4 th Street (Tustin) |

- | | |
|--|---|
| 3. Cabrillo Park Drive at First Street (Santa Ana) | 16. Cabrillo Park Drive at State Fund Access Road (Santa Ana) |
| 4. Golden Circle Drive at First Street (Santa Ana) | 17. Cabrillo Park Drive at Xerox Center Access Road (Santa Ana) |
| 5. Tustin Avenue at First Street (Tustin) | 18. Cabrillo Park Drive at 17 th Street (Santa Ana) |
| 6. Yorba Street at First Street (Tustin) | 19. Cabrillo Park Drive at Wellington Avenue (Santa Ana) |
| 7. I-5 SB On-Ramp/Mabury Street at 4 th Street (Santa Ana/Caltrans) | 20. Tustin Avenue at Wellington Avenue (Santa Ana) |
| 8. I-5 NB Ramps at 4 th Street (Santa Ana/Caltrans) | 21. Mabury Street at Fruit Street (Santa Ana) |
| 9. Cabrillo Park Drive at 4 th Street (Santa Ana) | 22. Cabrillo Park Drive at Fruit Street (Santa Ana) |
| 10. Golden Circle Drive at 4 th Street (Santa Ana) | 23. Park Center Drive at Fruit Street (Santa Ana) |
| 11. Park Center Drive at 4 th Street (Santa Ana) | 24. Tustin Avenue at Fruit Street (Santa Ana) |
| 12. Tustin Avenue at 4 th Street (Santa Ana) | 25. Cabrillo Park Drive at Park Court Place (Santa Ana) |
| 13. SR-55 SB Ramps at 4 th Street (Santa Ana/Caltrans) | |

- **Existing Traffic Conditions** – Twenty-four (24) of the twenty-five key study intersections currently operate at an acceptable level of service during the AM and PM peak hours. The intersection of SR-55 SB Ramps/4th Street currently operates at unacceptable LOS E during the AM peak hour.
- **Project Trip Generation** – The existing office building generates 1,876 daily trips, with 263 trips (231 inbound, 32 outbound) produced in the AM peak hour and 249 trips (42 inbound, 207 outbound) produced in the PM peak hour on a “typical” weekday.

The proposed Project, after application of a 5% internal capture rate, is forecast to generate 2,751 daily trips, with 213 trips (66 inbound, 147 outbound) produced in the AM peak hour and 249 trips (141 inbound, 108 outbound) produced in the PM peak hour on a “typical” weekday.

A comparison of the proposed Project’s trip generation to that of the Existing Land Use indicates that the Project will result in 875 more daily trips, 50 fewer AM peak hour trips and 0 more PM peak hour trips.

- **Related Projects Traffic Characteristics** – Thirty-seven (37) related projects were considered as part of the cumulative background setting. The thirty-seven (37) related projects are forecast to generate 50,043 daily trips, with 3,338 trips (1,378 inbound, 1,960 outbound) anticipated during the AM peak hour and 4,098 trips (2,266 inbound, 1,832 outbound) produced during the PM peak hour.
- **Existing Plus Project Traffic Conditions** – The twenty-five (25) study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours with the addition of project traffic to existing traffic.
- **Year 2026 Cumulative Traffic Conditions Plus Project** – Two (2) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining

study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.946	E
9. Cabrillo Park Drive at 4 th Street	--	--	0.907	E

Although the intersection of Elk Lane/First Street operates adversely during the PM peak hour, the proposed Project adds less than 0.010 increment to the ICU value and is therefore does not require recommended improvements based on the LOS standards and criteria specified in this report. Additionally, Cabrillo Park Drive/4th Street exceeds the level of service thresholds and requires Project-related improvements. However, the implementation of recommended improvements at this study intersection will help offset the Project's increment.

- ***Year 2045 Buildout Traffic Conditions Plus Project*** – Three (3) of the twenty-five (25) study intersections will operate at unacceptable service levels during the PM peak hour. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
1. Elk Lane at First Street	--	--	0.990	E
9. Cabrillo Park Drive at 4 th Street	--	--	0.949	E
12. Tustin Avenue at 4 th Street	--	--	0.924	E

Although the intersection of Elk Lane/First Street and Tustin Avenue/4th Street operates adversely during the PM peak hour, the proposed Project adds less than 0.010 increment to the ICU value and is therefore does not require recommended improvements based on the LOS standards and criteria specified in this report. Additionally, Cabrillo Park Drive/4th Street exceeds the level of service thresholds and requires Project-related improvements. However, the implementation of recommended improvements at this study intersection will help offset the Project's increment.

- ***Caltrans Existing Traffic Conditions*** – The intersection of SR-55 SB Ramps/4th Street currently operates at unacceptable LOS F in the AM peak hour. The remaining state-controlled study intersections currently operate at LOS C or better during the weekday AM and PM peak hours.
- ***Caltrans Existing Plus Project Traffic Conditions*** – The intersection of SR-55 SB Ramps/4th Street will continue to operate at unacceptable LOS F in the AM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours, with the addition of

project traffic. The implementation of recommended improvements at the intersection of SR-55 SB Ramps/4th Street will help offset the Project's increment.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Existing Plus Project traffic conditions.

- ***Caltrans Year 2026 Cumulative Plus Project Traffic Conditions*** – The intersection of SR-55 SB Ramps/4th Street will continue to operate at unacceptable LOS F in the AM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours, with the addition of project traffic. The implementation of recommended improvements at the intersection of SR-55 SB Ramps/4th Street will help offset the Project's increment.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Year 2026 Plus Project traffic conditions.

- ***Caltrans Year 2045 Buildout Plus Project Traffic Conditions*** – The intersections of SR-55 SB Ramps/4th Street and SR-55 NB Ramps/4th Street will continue to operate at unacceptable LOS E and/or F in the AM and/or PM peak hour with the addition of project traffic. The remaining state-controlled study intersections are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours, with the addition of project traffic. The implementation of recommended improvements at the two (2) intersections of SR-55 SB Ramps/4th Street and SR-55 NB Ramps/4th Street will help offset the Project's increment.

Additionally, queues for the I-5 SB Ramps at 4th Street, I-5 NB Ramp at 4th Street, SR-55 SB Ramps at 4th Street, and SR-55 NB Ramps at 4th Street were reviewed and the existing vehicular storage capacity is considered adequate under Year 2045 Buildout Plus Project traffic conditions.

- ***Daily Existing Plus Project Traffic Conditions*** – All twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to existing traffic.
- ***Year 2026 Cumulative Plus Project Traffic Conditions*** – All twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to Year 2026 traffic.
- ***Year 2045 Buildout Plus Project Traffic Conditions*** – All twelve (12) study segments are forecast to operate at acceptable service levels with the addition of proposed Project traffic to Year 2045 traffic.

- ***Project Site Access*** – The proposed Project driveways are forecast to operate at LOS C or better during the AM peak hour and PM peak hour under Year 2045 Buildout traffic conditions. Additionally, a gap analysis has been completed which concluded that vehicles will have adequate gaps along both Cabrillo Park Drive and 4th Street when exiting the project site.
- ***Planned Improvements*** – The following intersection improvements are anticipated to be implemented as part of the Central Pointe Project. As such, the following intersection improvements are planned.
 - **No. 8 – I-5 NB Ramps at Fourth Street:** Construct an additional westbound right-turn lane. Modify the existing traffic signal as necessary, inclusive any modifications to the traffic signal phasing.
 - **No. 9 – Cabrillo Park Drive at Fourth Street:** Construct an exclusive southbound right-turn lane. Modify the existing traffic signal as necessary. This improvement, which has been incorporated in the Central Pointe site plan as a “design feature” is subject to the review and approval of the City of Santa Ana.
 - **No. 25 – Cabrillo Park Drive at Park Court Place:** Install two-phase traffic signal and implement all necessary signing and striping improvements, inclusive of continental crosswalks and stop bars. This improvement is subject to the review and approval of the City of Santa Ana. It is noted that the proposed Project will also be responsible for the new traffic signal on Cabrillo Park Drive at Park Court Place, inclusive improvements to Project Driveway 2 to accommodate anticipated traffic signal and signing and striping associated the construction of this access.
- ***Existing Plus Project Recommended Improvements*** – The following intersection improvements are recommended to mitigate the impacts of the proposed Project under these conditions.
 - **No. 13 – SR-55 SB Ramps at Fourth Street:** Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana and Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project’s fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

It should be noted that although the intersection of Cabrillo Park Drive at Fourth Street is forecast to operate at acceptable service levels under Existing Plus Project traffic conditions, the intersection requires improvements under future traffic conditions, as noted in Sections 12.2.2 and 12.2.3 of this report. Since the recommended improvement is located within the Project

frontage, the Project may be expected to construct the following improvements and/or to paying their “fair-share” cost responsibility:

- **No. 9 – Cabrillo Park Drive at Fourth Street:** Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to pay a fair-share/local fee to cover the Project’s fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- ***Year 2026 Cumulative Plus Project Recommended Improvements*** – The following intersection improvements are recommended to mitigate the impacts of the proposed Project under these conditions.
 - **No. 9 – Cabrillo Park Drive at Fourth Street:** Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to construct the following improvements and/or pay a fair-share/local fee to cover the Project’s fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
 - **No. 13 – SR-55 SB Ramps at Fourth Street:** Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana and Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project’s fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018), City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- ***Year 2045 Buildout Plus Project Recommended Improvements*** – The following intersection improvements are recommended to mitigate the impacts of the proposed Project under these conditions.
 - **No. 9 – Cabrillo Park Drive at Fourth Street:** *Same as those identified in Section 12.2.2* – Widen and provide the additional right-of-way required to construct an exclusive westbound right-turn lane with 125-feet of storage and 90-feet transition. Modify the existing traffic signal as necessary. Per City requirements and at the discretion of the City, the Project may be expected to construct the following improvements and/or pay a fair-share/local fee to

cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement has been incorporated into Project site plan and is consistent with the recommendation identified in the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.

- **No. 13 – SR-55 SB Ramps at Fourth Street:** Modify the eastbound shared through/right-turn lane to construct a free-right turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana, City of Tustin and/or Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- **No. 14 – SR-55 NB Ramps at Irvine Boulevard:** Modify the eastbound approach to provide dual left-turn lanes and two through lanes. Modify the existing traffic signal as necessary. This improvement is subject to the review and approval of the City of Santa Ana, City of Tustin and/or Caltrans. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these mitigation measures. This improvement is consistent with the recommendation identified in the *MMRP for the MEMU Overlay District Expansion and Elan Development Project (August 2018)*, *City of Santa Ana*, as well as the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*.
- ***Project-Related Fair-Share Contribution*** – The proposed Project results in negative trips at the three (3) study intersections when considering the trip generation of the site's existing office buildings, and therefore, the percentage of net traffic impact has been identified as **0.00%**. However, when no credit for trips generated by the site's existing office building is taken, the proposed Project fair-share cost responsibility at the three (3) study intersections ranges between **3.95%** and **11.98%**, as shown below.

<u>Key Intersection</u>	<u>City/ Jurisdiction</u>	<u>Project Fair- Share Contribution</u>
9. Cabrillo Park Drive at Fourth Street	Santa Ana	11.98%
13. SR-55 SB Ramps at Fourth Street	Santa Ana/ Caltrans	5.84%
14. SR-55 NB Ramps at Fourth St/Irvine Blvd	Tustin/ Caltrans	3.95%