

Appendix R

Traffic Impact Analysis



TRAFFIC IMPACT ANALYSIS

2ND + PCH PROJECT

Long Beach, California
April 10, 2017

Prepared for:

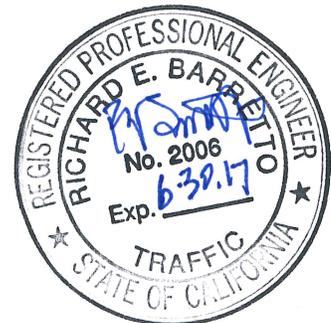
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TRAFFIC IMPACT ANALYSIS

2ND + PCH PROJECT

Long Beach, California

April 10, 2017

1.0 INTRODUCTION

This Traffic Impact Analysis report addresses the potential traffic impacts and circulation needs associated with the proposed 2nd + PCH Project (hereinafter referred to as Project). The project applicant proposes to construct up to 245,000 square feet (SF) of retail/commercial floor area. Of this total, the proposed Project will provide 95,000 SF of retail space, a 55,000 SF grocery store, a 25,000 SF fitness/health club, and 70,000 SF of restaurant uses consisting of 40,000 SF of full service dining, 25,000 SF of high-turnover restaurant/fast-food uses, and 5,000 SF of ready to eat/take-out food. The project site is a 10.77-acre parcel of land located at 6400 East Pacific Coast Highway in the City of Long Beach, California and is currently occupied by the existing 248-room Seaport Marina Hotel.

1.1 Scope of Work

This report documents the findings and recommendations of a traffic impact analysis, conducted by Linscott, Law & Greenspan, Engineers (LLG) for the proposed Project. The traffic analysis evaluates the existing operating conditions at thirty-one (31) key study intersections within the project vicinity, estimates the trip generation potential of the proposed Project, and superimposes the project-related traffic volumes on the circulation system as it currently exists as well as forecasts future operating conditions without and with the Project. Where necessary, intersection improvements/ mitigation measures are identified to offset the impact of the proposed Project.

This traffic report satisfies the traffic impact requirements of the City of Long Beach and is consistent with the current *Congestion Management Program (CMP) for Los Angeles County*. The Scope of Work for this traffic study, which is included in **Appendix A**, was developed in conjunction with City of Long Beach Traffic Engineering staff as well as Caltrans. Given that some of the key study intersections also reside within the City of Seal Beach, this report was also prepared to ensure consistency with City of Seal Beach requirements.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic count information has been collected at thirty-one (31) 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 project site has been researched at the City of Long Beach and City of Seal Beach. Based on our research and reconfirmed by City staff, there are four (4) cumulative projects in the City of Long Beach and two (2) cumulative projects in the City of Seal Beach. These six (6) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday and weekend day (Saturday) peak hour traffic conditions for a near-term (Year 2019) traffic setting upon completion of the proposed Project. Weekday and weekend day (Saturday) peak hour traffic forecasts for the Year 2019 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of one percent (1.0%) per year and adding traffic volumes generated by six (6) cumulative projects.

It should be noted that since the Project description/development tabulation is consistent with the City’s existing General Plan land use designation for the site, a long-term (General Plan Buildout) evaluation is not required.

1.2 Study Area

Thirty-one (31) key study intersections have been identified for evaluation based on discussions with City of Long Beach Traffic Engineering staff and in consideration of the 50 peak hour trip criterion, as well as comments from Caltrans staff. Of the thirty-one (31) identified intersections, twenty-four (24) are located in the City of Long Beach and seven (7) are located in the City of Seal Beach. The thirty-one (31) intersections listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic impact investigation. The jurisdiction where each key study intersection is located is also identified with the following nomenclature utilized; LB = Long Beach and SB = Seal Beach.

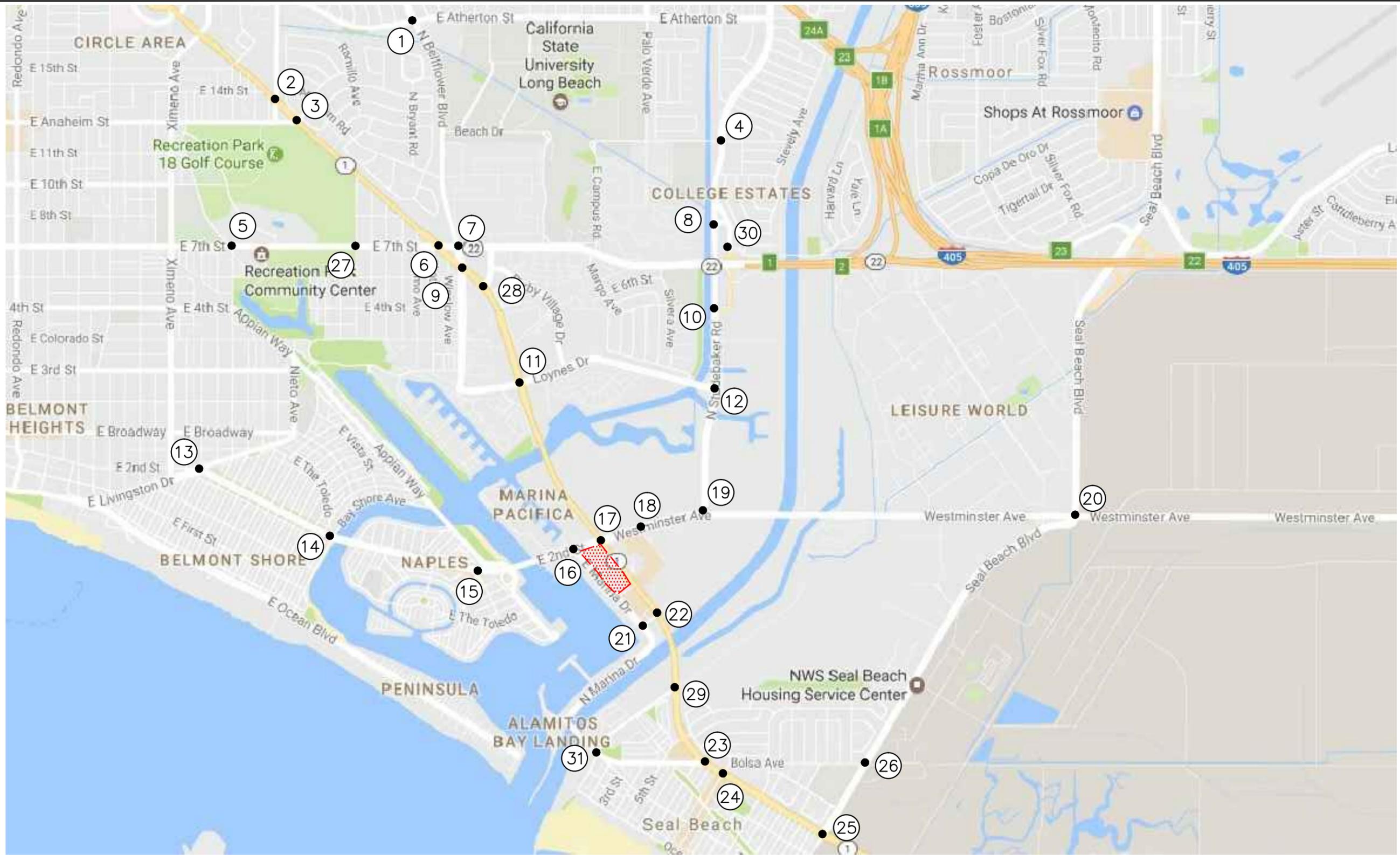
- | | |
|--|---|
| 1. Bellflower Boulevard at Atherton Street (LB) | 17. Pacific Coast Highway at 2nd Street (LB) ¹ |
| 2. Pacific Coast Highway at Clark Avenue (LB) | 18. Shopkeeper Road at 2nd Street (LB) |
| 3. Pacific Coast Highway at Anaheim Street (LB) | 19. Studebaker Road at 2nd Street (LB) |
| 4. Studebaker Road at Anaheim Road (LB) | 20. Seal Beach Blvd at Westminster Avenue (SB) |
| 5. Park Avenue at 7th Street (LB) | 21. Marina Drive at Studebaker Road (LB) |
| 6. Pacific Coast Highway at 7th Street (LB) ¹ | 22. Pacific Coast Highway at Studebaker Road (LB) |
| 7. Bellflower Boulevard at 7th Street (LB) | 23. Pacific Coast Highway at Marina Drive (SB) |
| 8. Studebaker Road at SR-22 WB Ramps (LB) | 24. Pacific Coast Hwy at Main St/Bolsa Ave (SB) |
| 9. Bellflower Blvd at Pacific Coast Highway (LB) | 25. Seal Beach Blvd at Pacific Coast Highway (SB) |
| 10. Studebaker Road at SR-22 EB Ramps (LB) | 26. Seal Beach Boulevard at Bolsa Avenue (SB) |
| 11. Pacific Coast Highway at Loynes Drive (LB) | 27. Santiago Avenue at 7 th Street (LB) |
| 12. Studebaker Road at Loynes Drive (LB) | 28. Pacific Coast Highway at Channel Drive (LB) |
| 13. Livingston Drive at 2nd Street (LB) | 29. Pacific Coast Highway at 1 st Street (SB) |
| 14. Bay Shore Avenue at 2 nd Street (LB) | 30. SR-22 WB Ramps/Studebaker at College Park Dr (LB) |
| 15. Naples Plaza at 2 nd Street (LB) | 31. 1 st Street at Marina Drive (SB) |
| 16. Marina Drive at 2 nd Street (LB) | |

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 Volume-Capacity (V/C) and 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.

¹ Los Angeles County Congestion Management Program (CMP) intersection.

Included in this traffic study report are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Weekday AM peak hour and PM peak hour and weekend day (Saturday) Midday peak hour capacity analyses for existing conditions and existing plus project conditions,
- Weekday AM peak hour, weekday PM peak hour and weekend day (Saturday) Midday peak hour capacity analyses for future (Year 2019) conditions without and with project traffic,
- Caltrans Evaluation,
- Site Access and Internal Circulation Evaluation,
- Area-Wide Traffic Improvements,
- Congestion Management Program Compliance Assessment,
- Caltrans Basic Freeway Segment Analysis, and
- Construction Traffic Impacts.



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SOURCE: GOOGLE

KEY

- # = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 1-1

VICINITY MAP
2ND + PCH PROJECT, LONG BEACH

2.0 PROJECT DESCRIPTION

The proposed project site is a 10.77-acre parcel of land located at 6400 East Pacific Coast Highway in the City of Long Beach, California. The project site is currently occupied primarily by the 248-room Seaport Marina Hotel. Based on information provided by the hotel operator, the existing Seaport Marina Hotel currently has 170 rooms in operation out of a possible 248 rooms. Access to the subject property is now provided by a right-turn only driveway and a full access driveway on Pacific Coast Highway, a right-turn only driveway on 2nd Street, and three driveways on Marina Drive that are limited to right-turn only movements. *Figure 2-1* presents an existing aerial of the Project site.

The proposed Project is expected to redevelop the 10.77-acre site at 6400 East Pacific Coast Highway. According to information provided by Eyestone Environmental and the City of Long Beach, the project site is designated as Land Use District (LUD) No. 7, Mixed Use District, by the City's General Plan and is zoned as Subarea 17 within Planned Development District 1 (PD-1), Southeast Area Development and Improvement Plan (SEADIP). Per the City's General Plan, LUD No.7 uses included development of employment centers, inclusive of retail/commercial uses like that of the proposed Project and hence is consistent with the General Plan land use designation for the subject property. The SEADIP identifies commercial uses within Subarea 17, and with the exception of the general developments provisions applicable to the entire development area, does not include specific development and use standards for Subarea 17².

Figure 2-2 presents the site plan for the proposed Project prepared by Centercal Properties, Inc. *Table 2-1* summarizes the proposed Project development totals for the site. As shown in *Table 2-1*, the proposed development will include the construction of up to 245,000 square feet (SF) of retail/commercial floor area, including 95,000 SF of retail uses, a 55,000 SF grocery store, a 25,000 SF fitness/health club, and 70,000 SF of restaurant uses consisting of 40,000 SF of full service dining, 25,000 SF of high-turnover restaurant/fast-food uses and 5,000 SF of ready to eat/take-out food. The Project would provide a total of 1,150 parking spaces within two main parking structures, including a second-level parking deck above some the single-story uses.

The Project is expected to be constructed in one phase over the next two years or so and completed by 2018. However, to provide a conservative assessment, Year 2019 has been utilized to assess the Project's potential traffic impacts at full occupancy of the retail center within an opening year traffic setting.

² The SEADIP states that Subarea 17 is fully developed in accordance with the Retail Center (CR) zone. Based on modifications for the City's Zoning Regulations, the CR zone now corresponds to the City's Community Commercial Automobile-Oriented (CCA) District. In accordance with the Long Beach Municipal Code, uses allowed in the CCA District include retail and service uses for an entire community, such as convenience and comparison shopping goods and associated services.

2.1 Site Access

As shown in *Figure 2-2*, access to the proposed Project will be provided via two driveways located along Pacific Coast Highway (referred to as Driveway No. 1 and No. 2), via three driveways located along Marina Drive (referred to as Driveway No. 3, No. 4 and No. 5) and via one driveway located along 2nd Street (referred to as Driveway No. 6). The following describes the access assumptions for each project driveway.

Pacific Coast Highway:

- Driveway No. 1: Left-turn in/right-turn in and right-turn out driveway.
- Driveway No. 2: Full access signalized intersection, to be located opposite an existing driveway that now serves the Long Beach Marketplace.

Marina Drive:

- Driveway No. 3: Right-turn in and right-turn out driveway.
- Driveway No. 4: Right-turn in and right-turn out driveway.
- Driveway No. 5: Right-turn in and right-turn out driveway.

2nd Street:

- Driveway No. 6: Right-turn in and right-turn out driveway.

It is noted that Project Driveways No. 1, No. 3, No. 4, and No. 5 are existing driveways that will remain in their current location as part of the proposed Project. Relative to Driveway No. 1, eastbound (outbound) left-turn movements from this driveway to northbound Pacific Coast Highway is currently allowed, but will be prohibited as a part of the Project. Proposed improvements to be completed as a part of the Project at the Pacific Coast Highway and Driveway No.2/Long Beach Marketplace intersection to provide access to the site, subject to the review and approval of the City of Long Beach and Caltrans include the following:

- Construction of Driveway No. 2 opposite the newly realigned Long Beach Marketplace driveway to minimize off set of lanes through the intersection. Driveway No. 2 will provide one (1) inbound lane and three (3) outbound lanes, whereas the Long Beach Marketplace driveway will provide two (2) inbound lanes and two (2) outbound lanes,
- Modification of the existing striping on Pacific Coast Highway to provide a dedicated northbound left-turn lane and dedicated southbound left-turn lane at Driveway No. 2, as well as dedicated southbound right-turn lanes at the Driveway No. 1 and Driveway No. 2.
- Installation of a new traffic signal, to include protected left-turn phasing, subject to the approval of the City of Long Beach and Caltrans.

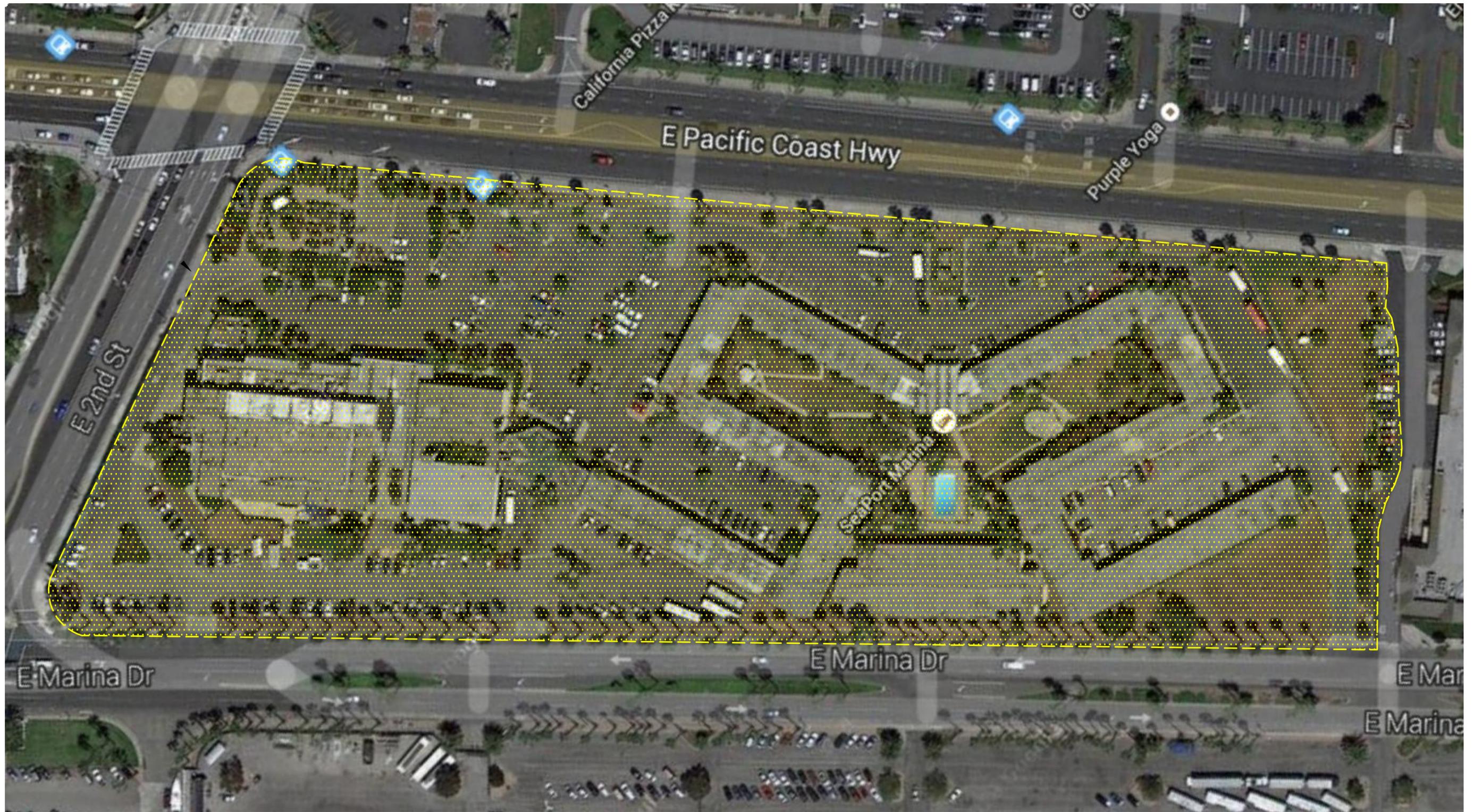
2.2 Pedestrian Circulation

Pedestrian circulation would be provided via existing public sidewalks along Pacific Coast Highway, Marina Drive and 2nd Street, which will connect to the project's internal walkways. The Project will protect the existing sidewalk along project frontage and if necessary repair or reconstruct sidewalks along the project frontage per the City's request. The existing sidewalk system within the project vicinity provides direct connectivity to the adjacent existing commercial development and public transit along Pacific Coast Highway and 2nd Street.

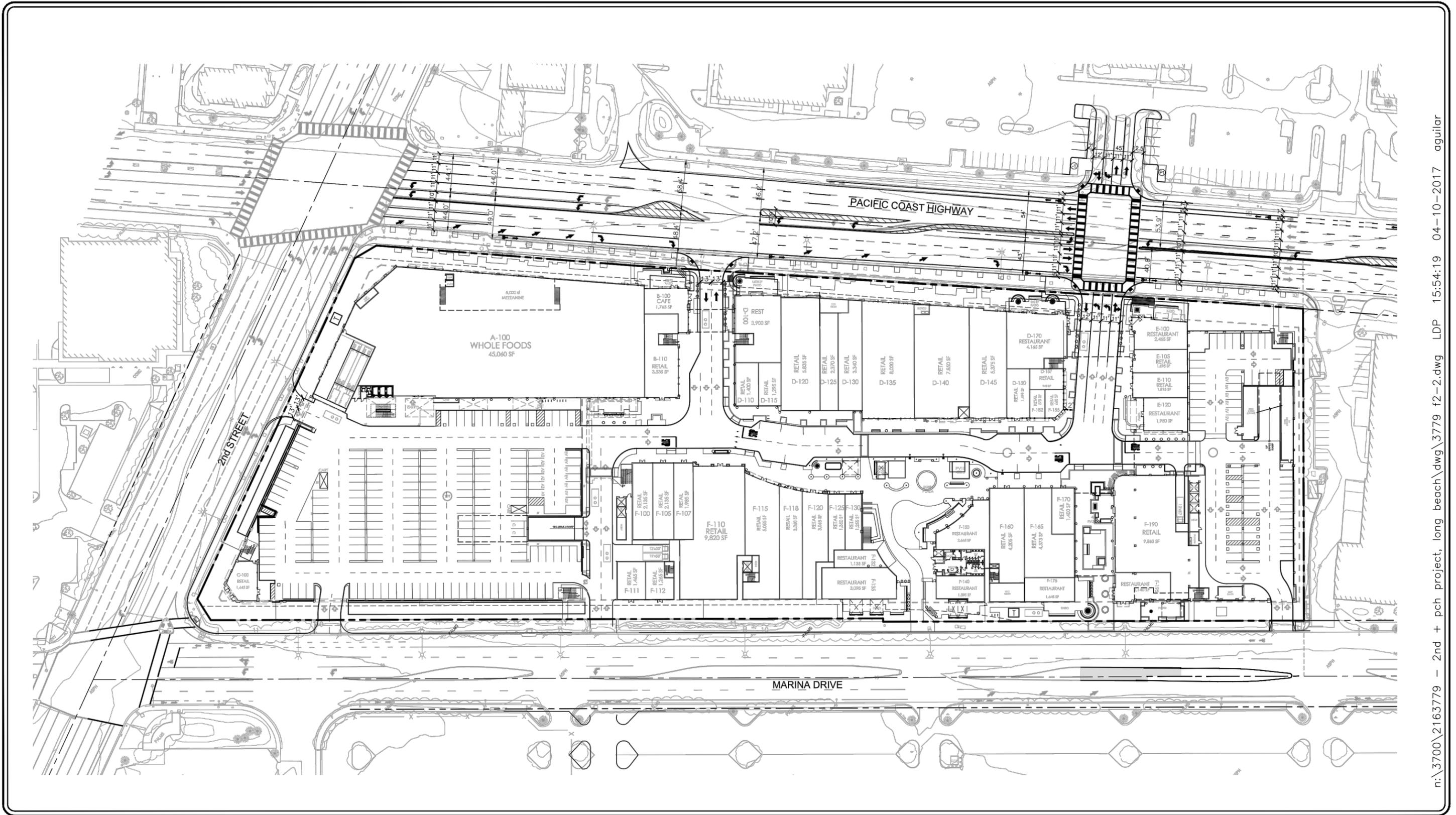
TABLE 2-1
PROJECT DEVELOPMENT SUMMARY³

Land Use / Project Description	Project Development Totals Gross Floor Area (SF)
<input type="checkbox"/> Retail Sales	95,000 SF
<input type="checkbox"/> Grocery Store	55,000 SF
<input type="checkbox"/> Restaurant – Full Service	40,000 SF
<input type="checkbox"/> Restaurant – Fast Food	25,000 SF
<input type="checkbox"/> Restaurant – Ready To Eat	5,000 SF
<input type="checkbox"/> Fitness/Health Club	25,000 SF
<input type="checkbox"/> Parking Supply	1,150 spaces
Total Floor Area (Maximum)	245,000 SF

³ Source: Eyestone Environmental/Centercal Properties, LLC



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SOURCE: CENTRAL PROPERTIES, INC.



FIGURE 2-2

PROPOSED SITE PLAN
2ND + PCH PROJECT, LONG BEACH

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The principal local network of streets serving the project site are Pacific Coast Highway, Studebaker Road, 7th Street, 2nd Street and Marina Drive. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Pacific Coast Highway is generally a four-lane divided roadway oriented in the north-south direction. Pacific Coast Highway borders the project site to the east and will provide access to the site via one unsignalized left-turn in/right-turn in and right-turn out driveway and via one signalized driveway. Parking is generally permitted on either side of this roadway. For the roadway segment of Pacific Coast Highway fronting the project site there are three lanes in the northbound direction and two lanes in the southbound direction, and on-street parking is not permitted on either side of the roadway. The posted speed limit on Pacific Coast Highway is generally 45 miles per hour (mph). Traffic signals control the study intersections of Pacific Coast Highway at Clark Avenue, Anaheim Street, 7th Street, Bellflower Boulevard, Channel Drive, Loynes Drive, 2nd Street, Studebaker Road, 1st Street, Main Street/Bolsa Avenue and Seal Beach Boulevard.

Studebaker Road is generally a four-lane divided roadway oriented in the north-south direction. Parking is not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on Studebaker Road is generally 45 mph. Traffic signals control the study intersections of Studebaker Road at Anaheim Road, the SR-22 Westbound Ramps, the SR-22 Eastbound Ramps, Loynes Drive, 2nd Street and Pacific Coast Highway.

7th Street is generally a six-lane undivided roadway oriented in the east-west direction. However, near Park Avenue, 7th Street is a four-lane roadway. Parking is generally not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on 7th Street is generally 40 mph. Traffic signals control the study intersections of 7th Street at Park Avenue, Santiago Avenue, Pacific Coast Highway and Bellflower Boulevard.

2nd Street is generally a four-lane divided roadway oriented in the east-west direction, which borders the project site to the north. However, between Naples Plaza and Studebaker Road, 2nd Street is a six-lane divided roadway. 2nd Street will provide access to the site via one right-turn in/right-turn out only driveway. Parking is generally not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on 2nd Street ranges from 25-50 mph, while the segment fronting the project site has a posted speed limit of 40 mph. Traffic signals control the study intersections of 2nd Street at Livingston Drive, Bay Shore Avenue, Naples Plaza, Marina Drive, Pacific Coast Highway, Shopkeeper Road, Studebaker Road and Seal Beach Boulevard.

Marina Drive is generally a four-lane divided roadway oriented in the north-south direction. Marina Drive borders the project site to the west and will provide access to the site via one unsignalized left-turn in/right-turn in and right-turn out driveway and via two unsignalized right-turn in and right-turn out driveways. Parking is generally not permitted on either side of this roadway

within the vicinity of the project. The posted speed limit on Marina Drive is 35 mph. A traffic signal controls the study intersection of Marina Drive and 2nd Street.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. The number of travel lanes and intersection controls for the key area intersections are identified.

3.2 Existing Traffic Volumes

Thirty-one (31) 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 expected relative impacts of the project. These key intersections were selected for evaluation based on discussions with City of Long Beach staff and in consideration of Los Angeles County CMP requirements.

Existing weekday peak hour traffic volumes for the thirty-one (31) key study intersections evaluated in this report were obtained from manual turning movement counts conducted by Transportation Studies, Inc. (TSI) in November 2016 when local area schools were in session. Existing weekend day (Saturday) Midday peak hour traffic counts for the key study intersections were conducted by Transportation Studies, Inc. (TSI) in August 2013. The Year 2013 Saturday traffic count data was factored up by 3.0% (i.e. one percent per year for three years) to bring them up to current Year 2016 existing Saturday baseline traffic conditions.

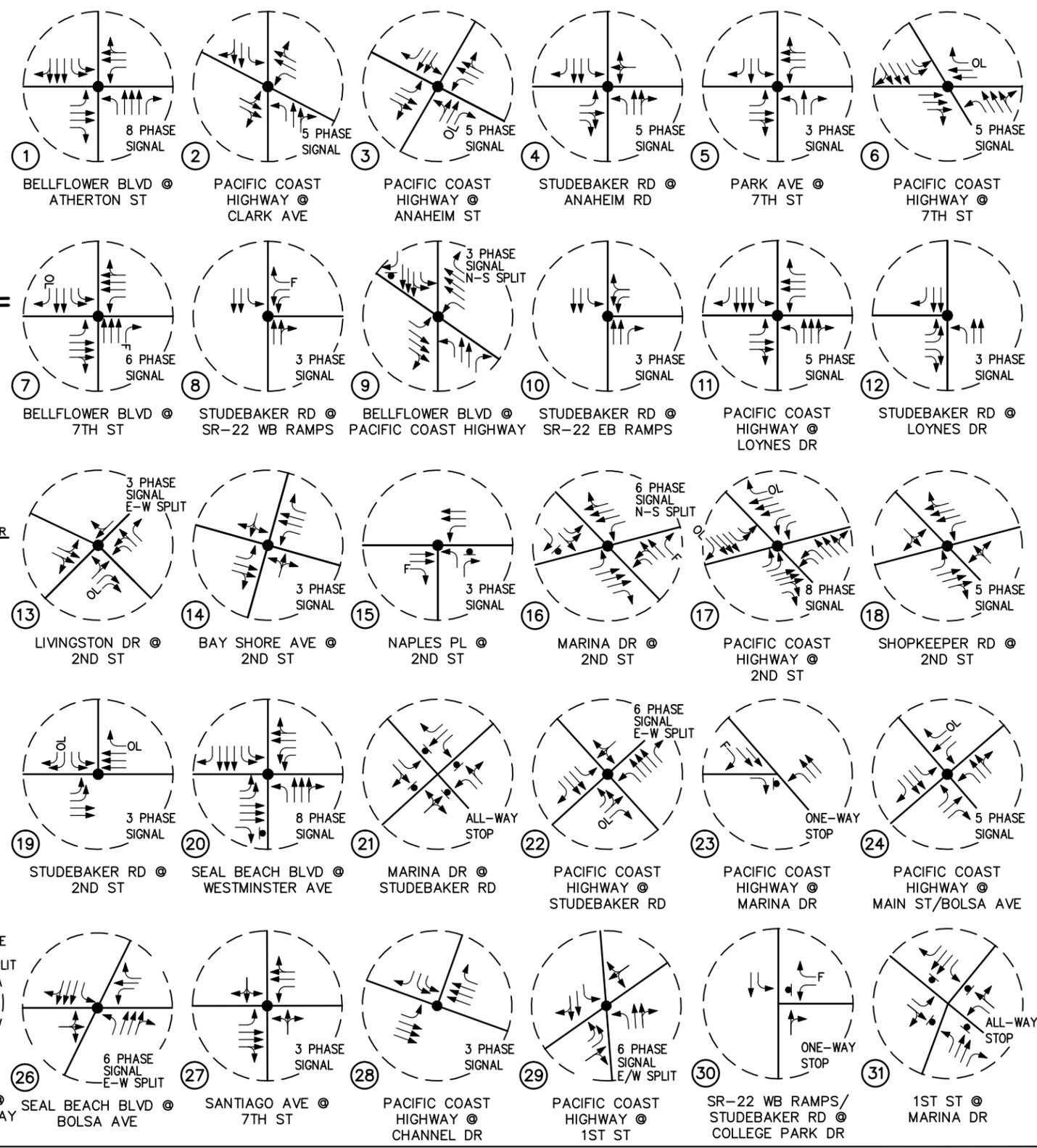
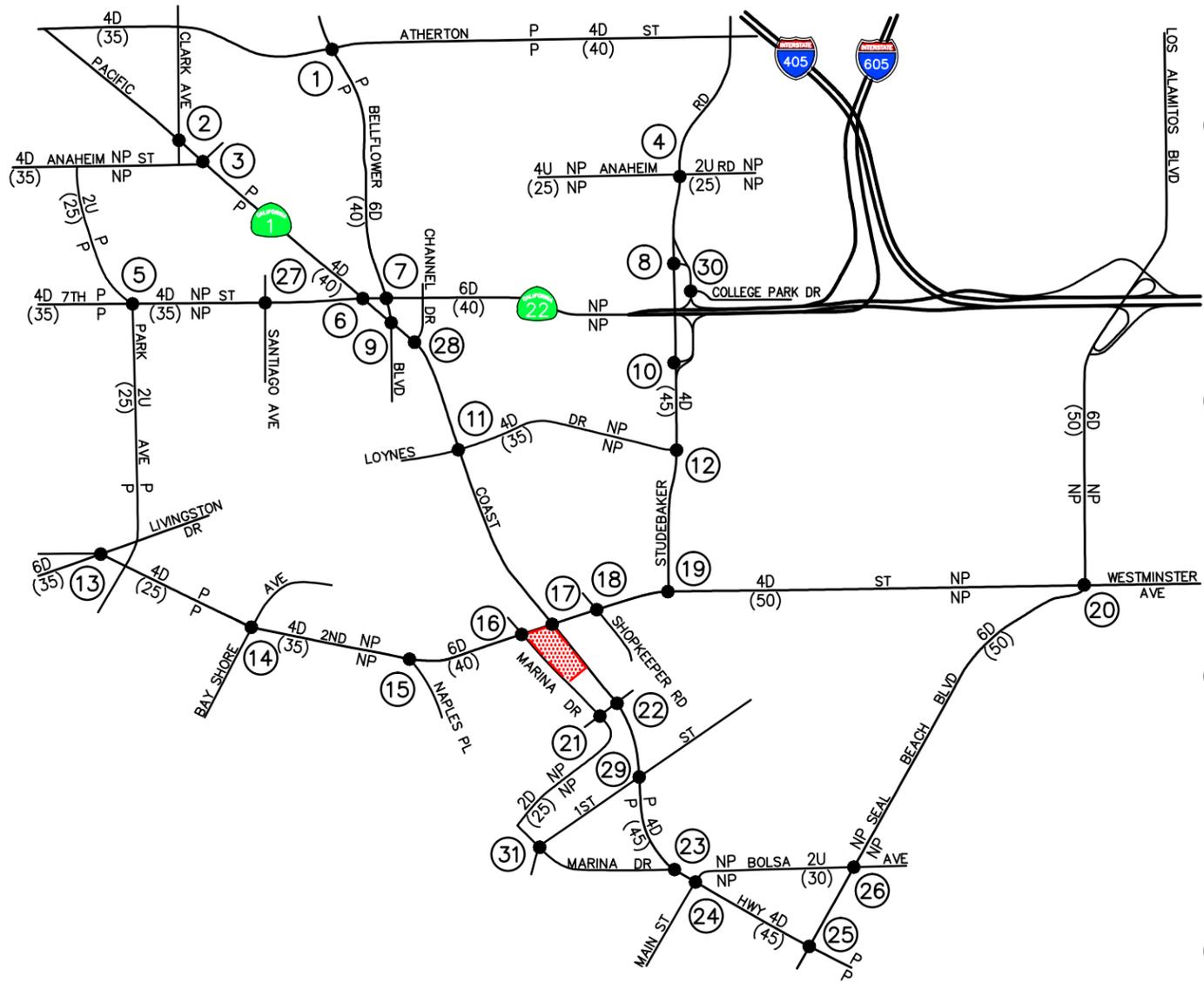
Figures 3-2 and **3-3** illustrate the existing weekday AM and PM peak hour traffic volumes at the thirty-one (31) key study intersections evaluated in this report, respectively. **Figure 3-4** illustrates the existing weekend day (Saturday) Midday peak hour traffic volumes at the key study intersections. **Appendix B** contains the detailed peak hour count sheets for the key intersections evaluated in this report.

3.3 Existing Public Transit

Long Beach Transit (LBT), the Los Angeles County Metropolitan Transportation Authority and the Orange County Transportation Authority (OCTA) provide public transit services in the vicinity of the proposed Project. **Figures 3-5A, 3-5B** and **3-5C** graphically illustrate the LBT routes, the Los Angeles County Metropolitan Transportation Authority routes and the OCTA routes within the project study area, respectively. **Figure 3-6** identifies the location of the existing bus stops in proximity to the Project site.

3.4 Existing Bicycle Master Plan

The City of Long Beach promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bicycle Master Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The City of Long Beach Bicycle Facilities in the vicinity of the Project site (existing and proposed) is shown on **Figure 3-7**.



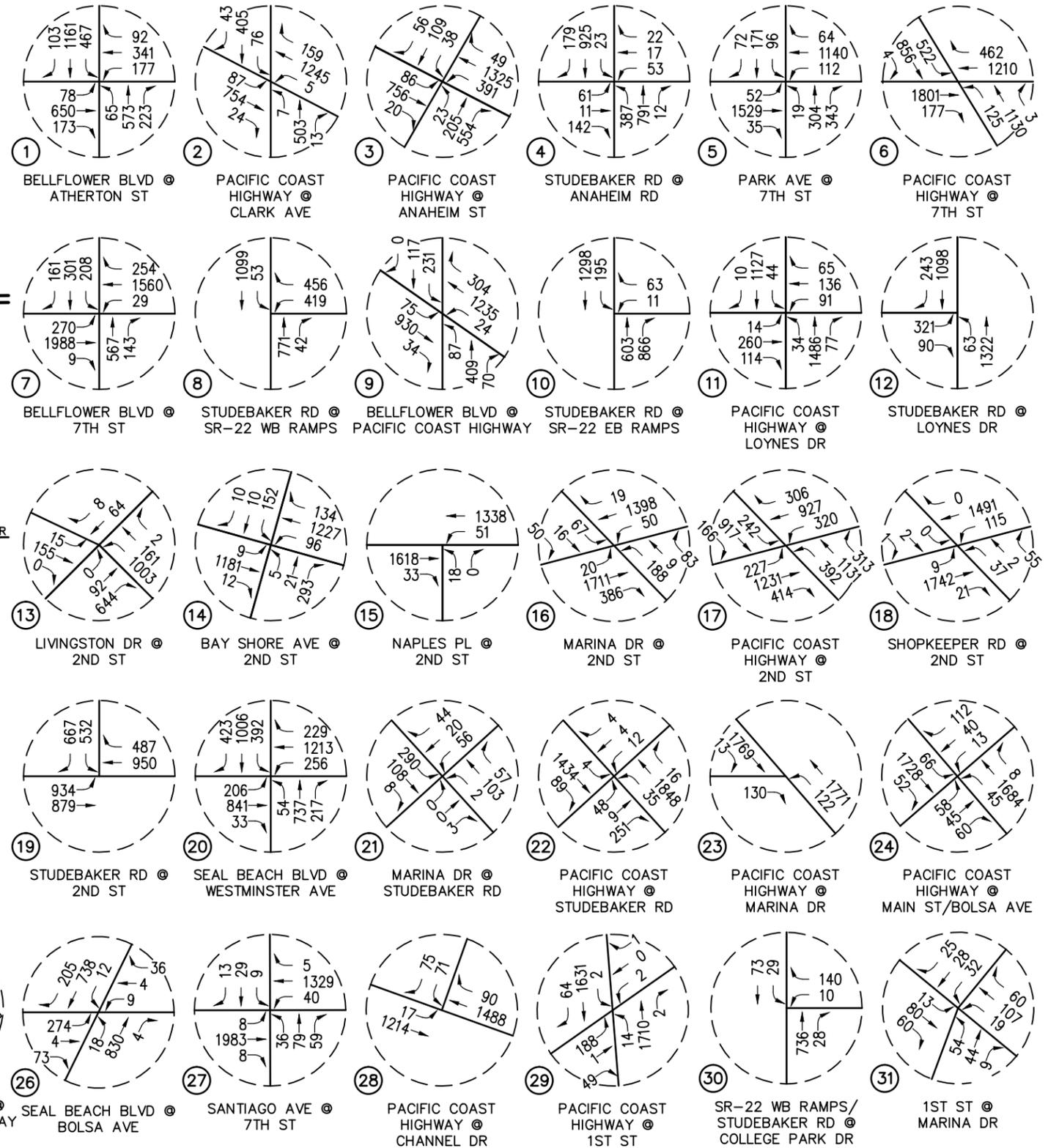
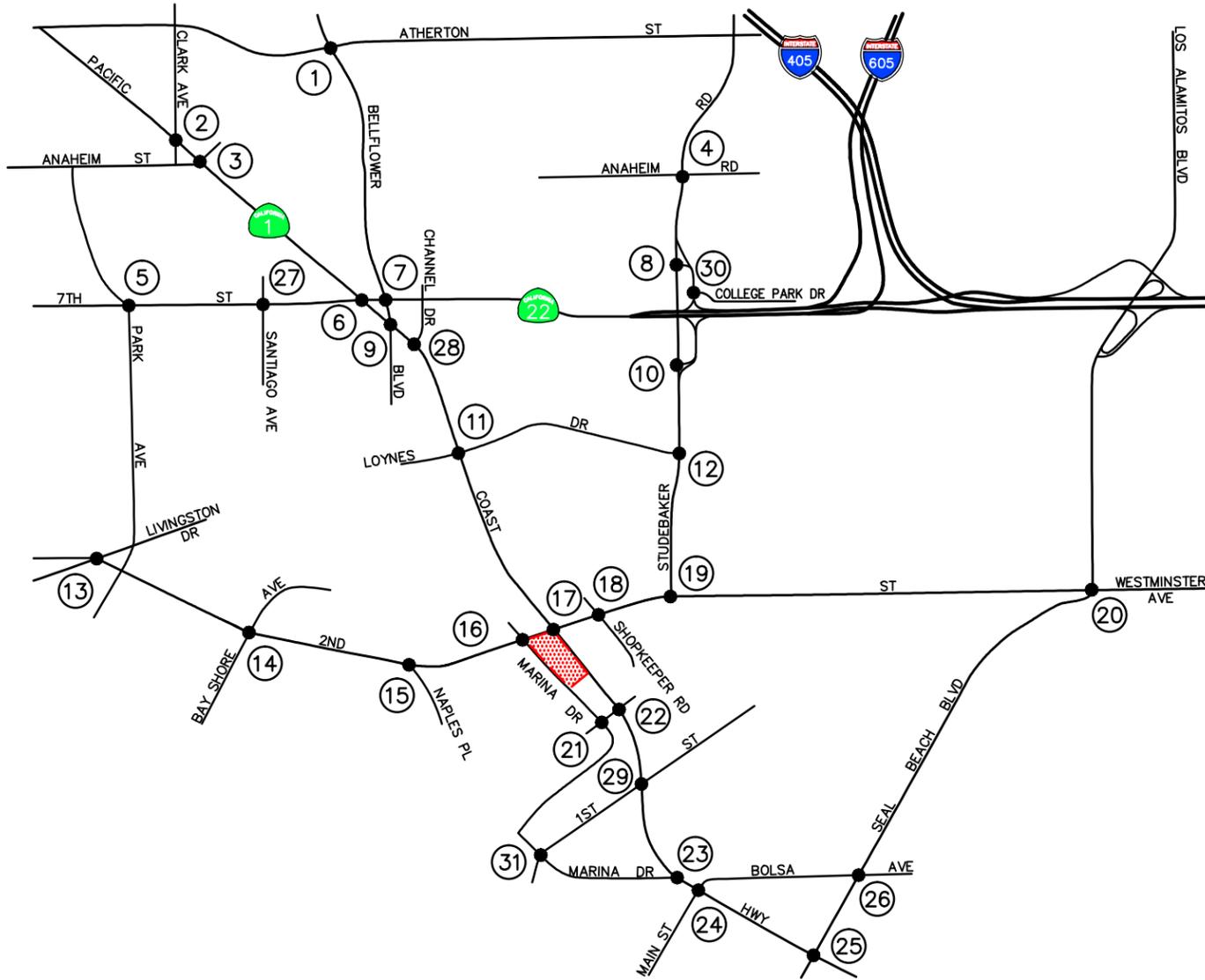
LINSCOTT
LAW &
GREENSPAN
engineers



- KEY**
- # = STUDY INTERSECTION
 - ← = APPROACH LANE ASSIGNMENT
 - = TRAFFIC SIGNAL, ▼ = STOP SIGN
 - P = PARKING, NP = NO PARKING
 - U = UNDIVIDED, D = DIVIDED
 - 2 = NUMBER OF TRAVEL LANES
 - (XX) = POSTED SPEED LIMIT (MPH)
 - F = FREE-RIGHT
 - OL = OVERLAP
 - [Red Hatched Box] = PROJECT SITE

FIGURE 3-1
EXISTING ROADWAY CONDITIONS
AND INTERSECTION CONTROLS
2ND + PCH PROJECT, LONG BEACH

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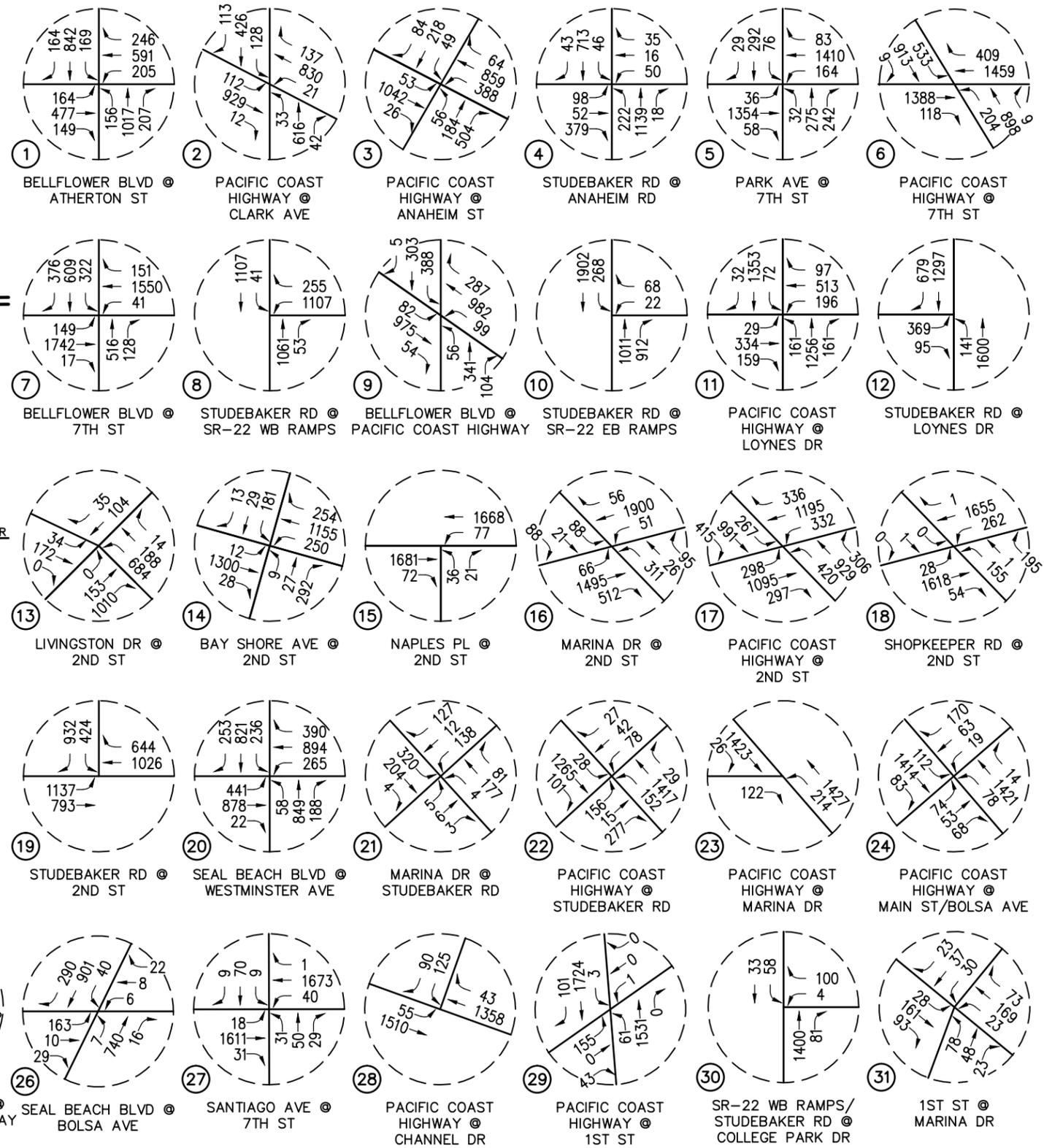
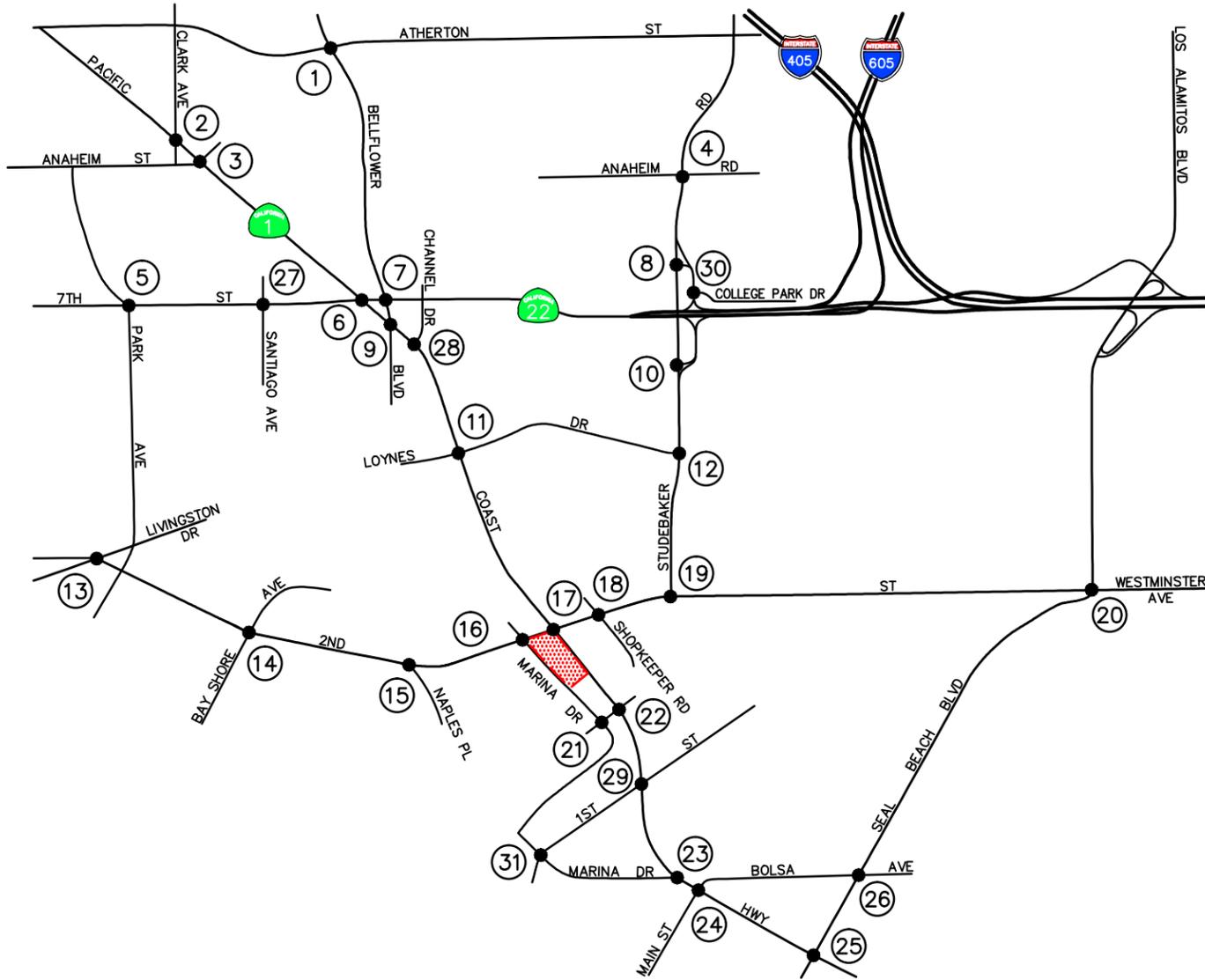


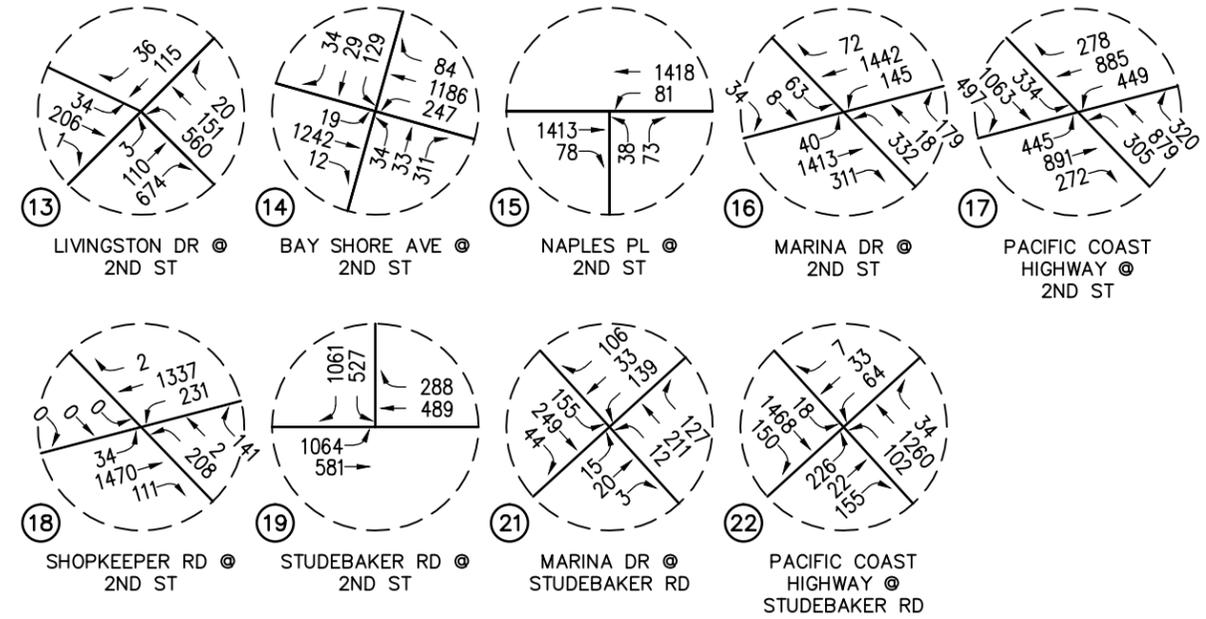
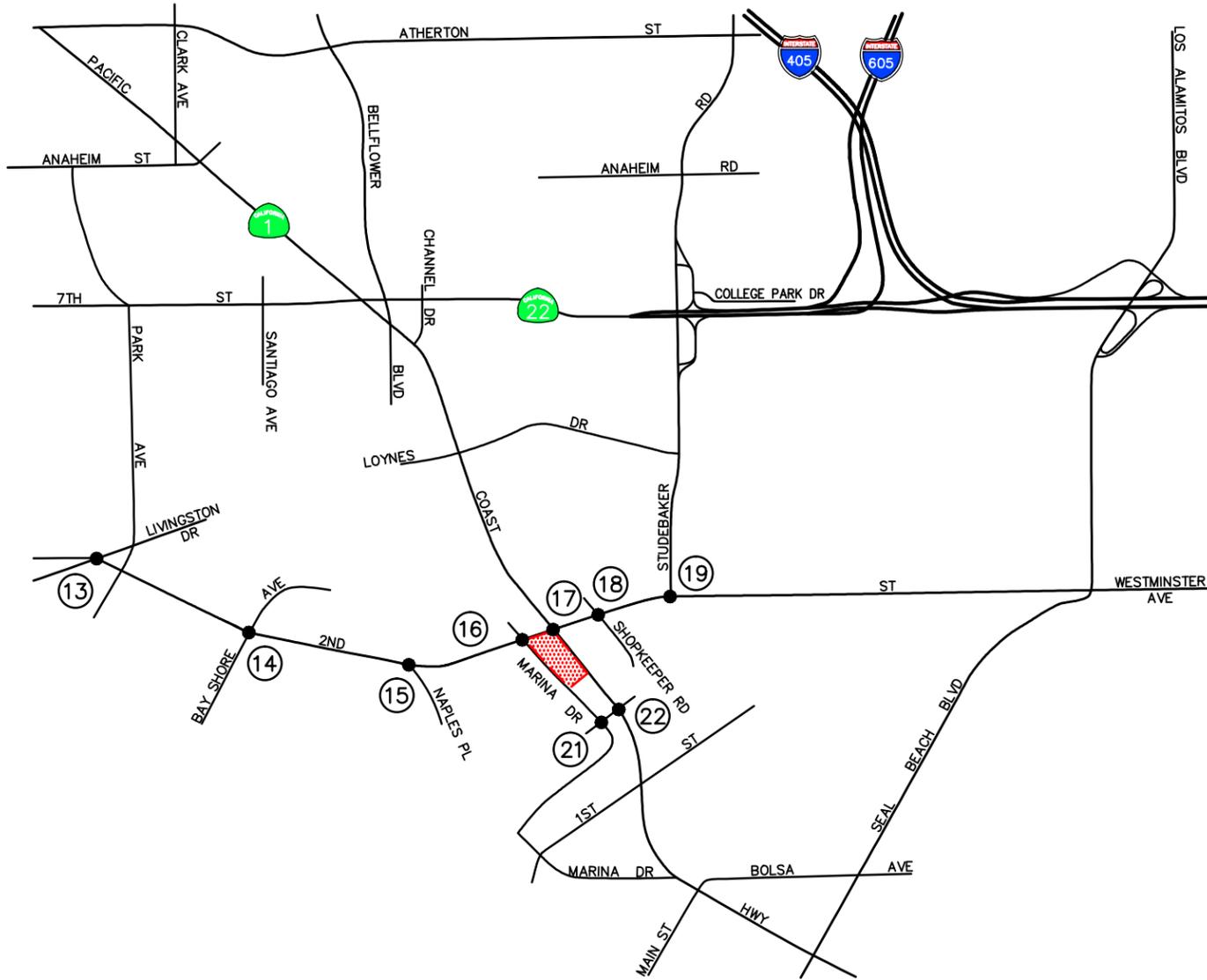
KEY
 # = STUDY INTERSECTION
 [Red Hatched Box] = PROJECT SITE

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

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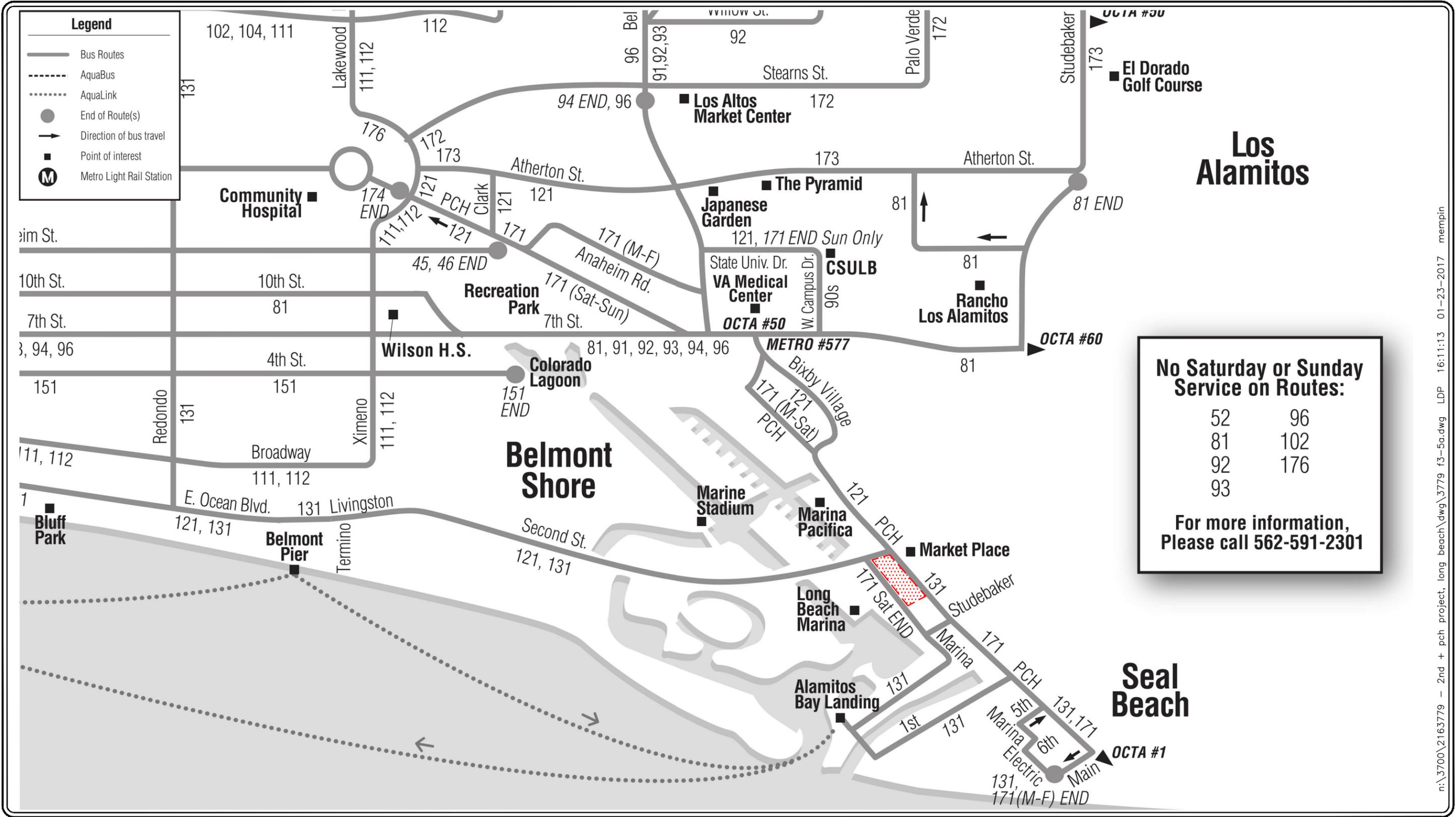


KEY

- = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 3-4

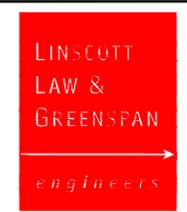
EXISTING SATURDAY PEAK HOUR TRAFFIC VOLUMES
2ND + PCH PROJECT, LONG BEACH



No Saturday or Sunday Service on Routes:

52	96
81	102
92	176
93	

For more information, Please call 562-591-2301



SOURCE: CITY OF LONG BEACH

KEY
 = PROJECT SITE

FIGURE 3-5A

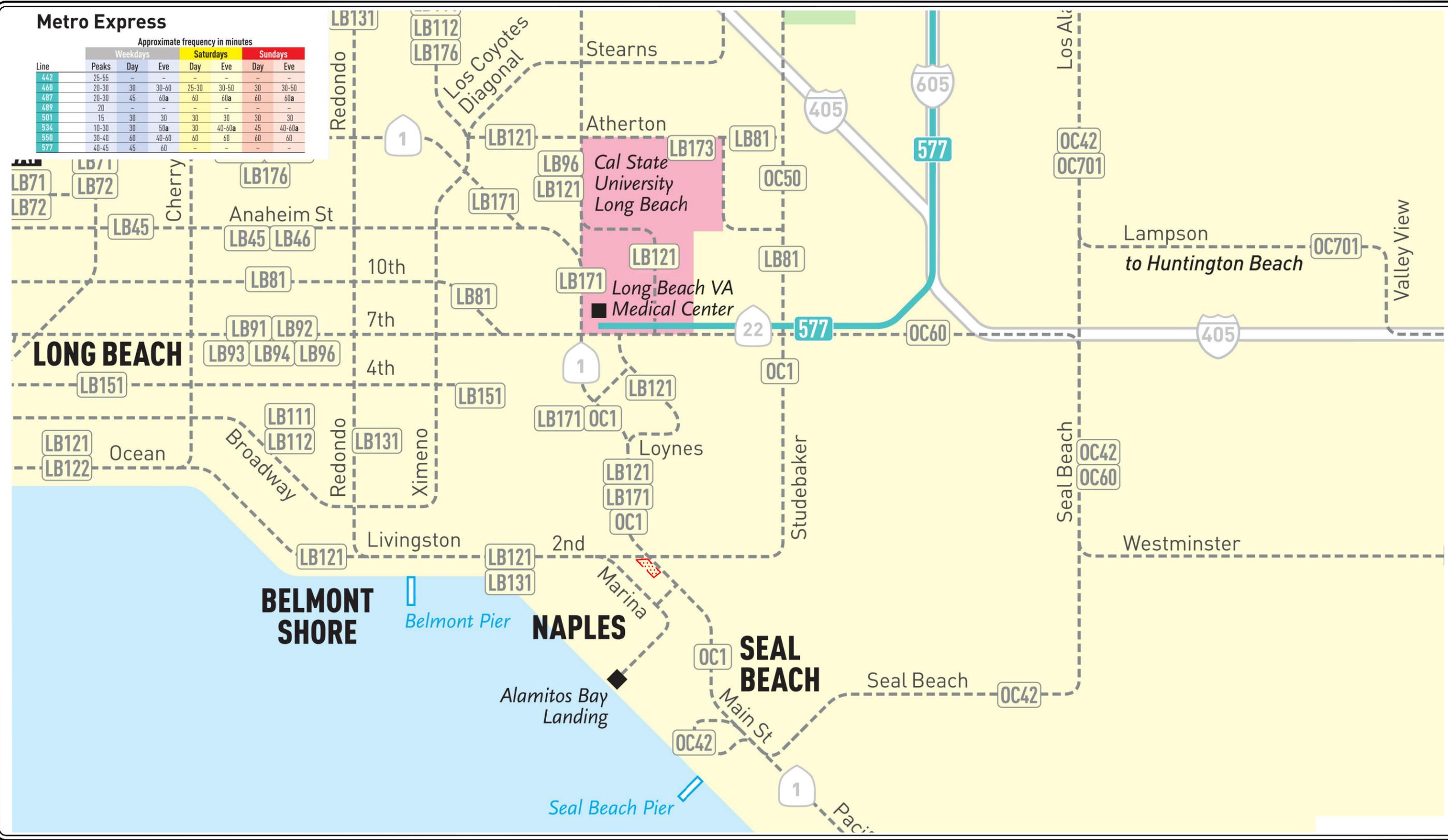
EXISTING LONG BEACH TRANSIT MAP
 2ND + PCH PROJECT, LONG BEACH

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Metro Express

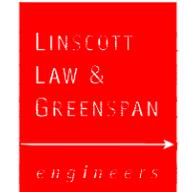
Approximate frequency in minutes

Line	Weekdays			Saturdays		Sundays	
	Peaks	Day	Eve	Day	Eve	Day	Eve
442	25-55	-	-	-	-	-	-
460	20-30	30	30-60	25-30	30-50	30	30-50
487	20-30	45	60a	60	60a	60	60a
489	20	-	-	-	-	-	-
501	15	30	30	30	30	30	30
534	10-30	30	50a	30	40-60a	45	40-60a
550	30-40	60	40-60	60	60	60	60
577	40-45	45	60	-	-	-	-



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SOURCE: LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY



KEY
 = PROJECT SITE

FIGURE 3-5B

EXISTING LOS ANGELES METRO TRANSIT MAP
 2ND + PCH PROJECT, LONG BEACH

- 1 — Routes offering 15 minutes (or less) Weekday rush hour frequency
- 1 — Local Routes (1-99)
- 100 — Community and Shuttle Routes (100-199)
- 200 — Intracounty Express Routes (200-299) Weekday Rush Hour Only
- 400 — Stationlink Metrolink Rail Feeder Routes (400-499) Weekday Rush Hour Only
- 543 — Bravo Limited Stop Service
- 700 — Intercounty Express Service Weekday Rush Hour Only
-  Rail Stations
-  OC BUS Transit Centers

Effective October 9, 2016



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SOURCE: ORANGE COUNTY TRANSPORTATION AUTHORITY (OCTA)

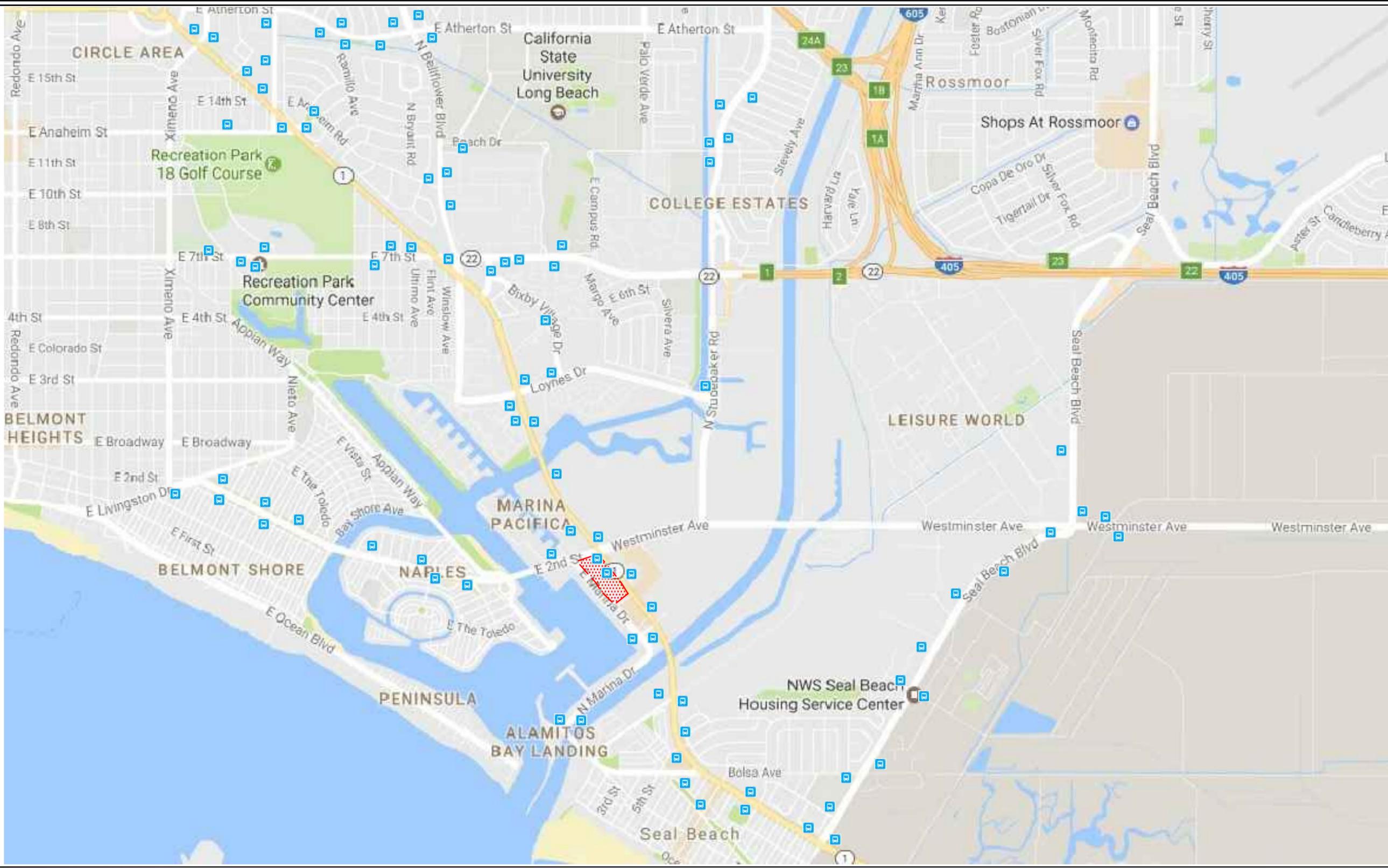
KEY
 = PROJECT SITE

LINSCOTT
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 GREENSPAN
 engineers



FIGURE 3-5C

EXISTING OCTA TRANSIT MAP
 2ND + PCH PROJECT, LONG BEACH



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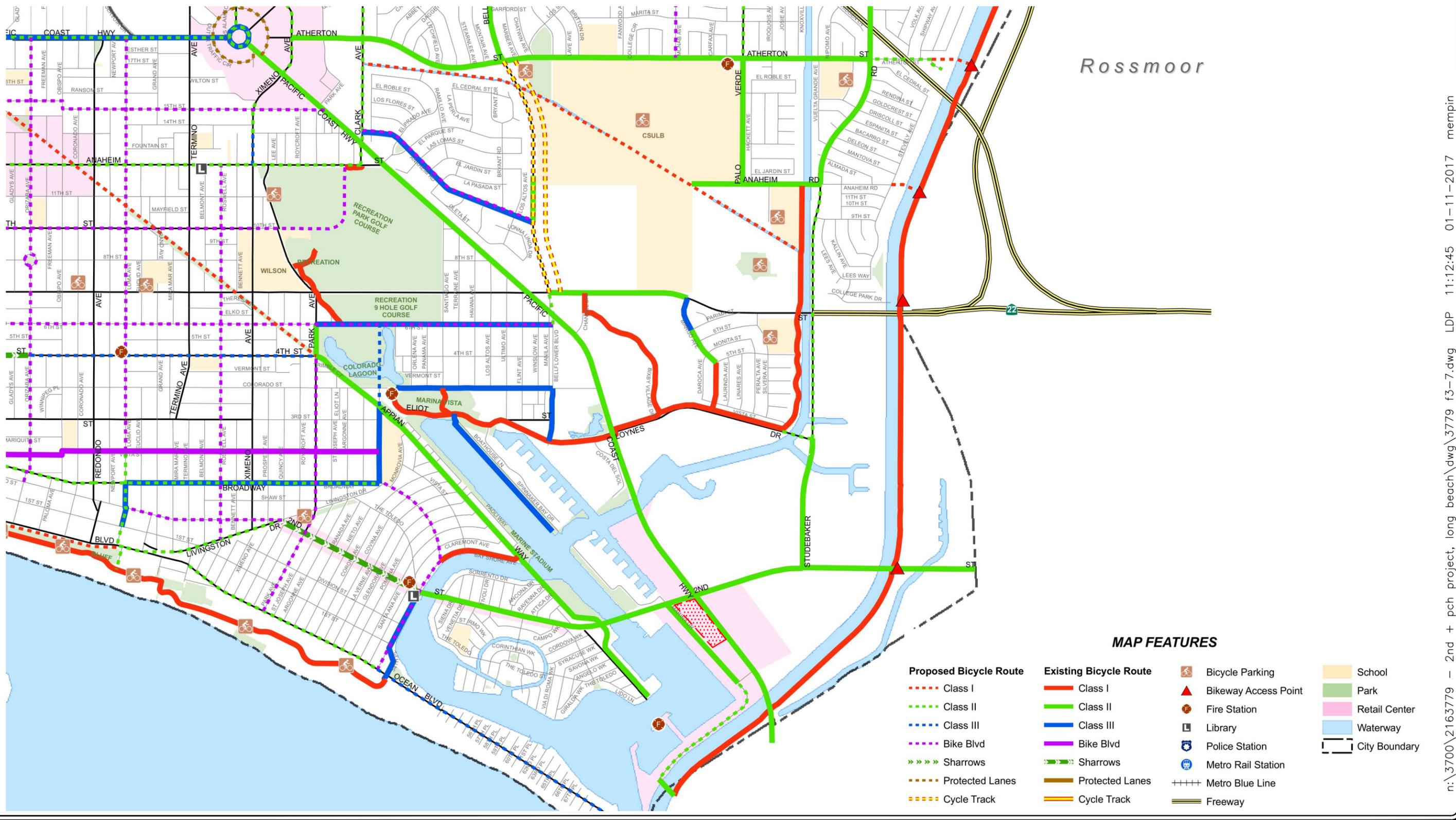


SOURCE: GOOGLE

- KEY
-  = PROJECT SITE
 -  = TRANSIT STOP

FIGURE 3-6

TRANSIT STOP LOCATIONS
2ND + PCH PROJECT, LONG BEACH



3.5 Existing Intersection Conditions

Existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology. All unsignalized intersections were evaluated using the *Highway Capacity Manual* (HCM) 2010 Operations methodology. The HCM 2010 Operations methodology was also utilized to evaluate key study intersections that are also under the jurisdiction of Caltrans.

3.5.1 *Intersection Capacity Utilization (ICU) Method of Analysis*

In conformance with City of Long Beach and LA County CMP requirements, existing weekday and weekend day (Saturday) 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 LA County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through, and right-turn lanes, and dual left turn capacity of 2,880 vph. A clearance interval is also added to each Level of Service calculation. Per City of Long Beach requirements, clearance intervals are based on the number of phases in the intersection and whether the left turning movements are all fully protected or whether some of them are permitted with other left-turn movements being protected. **Table 3-1** shows the clearance intervals used in the analysis of the key study intersections within the City of Long Beach.

For the study intersections located in the City of Seal Beach, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn lanes and shared lanes and a through lane and right-turn lane capacity of 1,700 vph. Per City of Seal Beach requirements, a clearance adjustment factor of 0.10 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 six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in **Table 3-2**. 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 movements.

3.5.2 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

Based on the HCM 2010 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 3-3**.

3.5.3 Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)

The HCM 2010 unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections and project driveways. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. For all-way stop controlled intersections, the overall average control delay measured in seconds per vehicle, and level of service is then calculated for the entire intersection. For one-way and two-way stop-controlled (minor street stop-controlled) intersections, this methodology estimates the worst side street delay, measured in seconds per vehicle and determines the level of service for that approach. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in **Table 3-4**.

3.6 Level of Service Criteria

According to the City of Long Beach, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, or the current LOS if the existing LOS is worse than LOS D (i.e. LOS E or F). For the study intersections in the City of Seal Beach, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours.

TABLE 3-1
CITY OF LONG BEACH CLEARANCE INTERVALS⁴

Number of Signal Phases	Left-turn Phasing Type	Clearance Interval (Percent)
2	Permitted	10%
3	Protected and Permitted	12%
3	Fully Protected	15%
4	Protected and Permitted	14%
4	Fully Protected	18%

⁴ Source: *City of Long Beach Guidelines for Signalized Intersection Analysis, 2004.*

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601 – 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	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	0.901 – 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	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 3-3
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM METHODOLOGY)⁵

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	<p>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.</p>
B	> 10.0 and ≤ 20.0	<p>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.</p>
C	> 20.0 and ≤ 35.0	<p>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.</p>
D	> 35.0 and ≤ 55.0	<p>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.</p>
E	> 55.0 and ≤ 80.0	<p>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.</p>
F	≥ 80.0	<p>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.</p>

⁵ Source: *Highway Capacity Manual* (Signalized Intersections).

TABLE 3-4
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS⁶

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	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

⁶ Source: *Highway Capacity Manual* (Unsignalized Intersections).

3.7 Existing Level of Service Results

Table 3-5 summarizes the existing peak hour service level calculations for the thirty-one (31) key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-5* indicates that ten (10) of the thirty-one (31) key study intersections currently operate at an unacceptable LOS during the AM and/or PM peak hours. The remaining twenty-one (21) key study intersections currently operate at acceptable LOS D or better during the AM and/or PM peak hours. The intersections operating at an adverse level of service are:

<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>
5. Park Avenue at 7 th Street	0.953	E	---	---
6. Pacific Coast Highway at 7 th Street	0.979	E	0.980	E
7. Bellflower Boulevard at 7 th Street	0.917	E	---	---
8. Studebaker Rd at SR-22 WB Ramps	---	---	0.908	E
10. Studebaker Rd at SR-22 EB Ramps	---	---	0.931	E
14. Bay Shore Avenue at 2 nd Street	---	---	1.009	F
17. Pacific Coast Highway at 2 nd Street	0.933	E	---	---
19. Studebaker Road at 2 nd Street	---	---	0.947	E
20. Seal Beach Blvd at Westminster Ave	0.936	E	0.929	E
23. Pacific Coast Highway at Marina Dr	36.5 s/v	E	---	---

Appendix C presents the existing ICU/LOS and HCM/LOS calculations for the thirty-one (31) key study intersections.

TABLE 3-5
EXISTING PEAK HOUR LEVELS OF SERVICE

Key Intersection	Jurisdiction	Time Period	Control Type	ICU/HCM	LOS
1. Bellflower Boulevard at Atherton Street	Long Beach	AM PM	8Ø Traffic Signal	0.795 0.851	C D
2. Pacific Coast Highway at Clark Avenue	Long Beach/ Caltrans	AM PM	5Ø Traffic Signal	0.854 0.818	D D
3. Pacific Coast Highway at Anaheim Street	Long Beach/ Caltrans	AM PM	5Ø Traffic Signal	0.763 0.845	C D
4. Studebaker Road at Anaheim Road	Long Beach	AM PM	5Ø Traffic Signal	0.777 0.706	C C
5. Park Avenue at 7th Street	Long Beach	AM PM	3Ø Traffic Signal	0.953 0.883	E D
6. Pacific Coast Highway at 7th Street	Long Beach/ Caltrans	AM PM	5Ø Traffic Signal	0.979 0.980	E E
7. Bellflower Boulevard at 7th Street	Long Beach/ Caltrans	AM PM	6Ø Traffic Signal	0.917 0.847	E D
8. Studebaker Road at SR-22 Westbound Ramps	Long Beach/ Caltrans	AM PM	3Ø Traffic Signal	0.639 0.908	B E
9. Bellflower Boulevard at Pacific Coast Highway	Long Beach/ Caltrans	AM PM	3Ø Traffic Signal	0.662 0.668	B B
10. Studebaker Road at SR-22 Eastbound Ramps	Long Beach/ Caltrans	AM PM	3Ø Traffic Signal	0.852 0.931	D E
11. Pacific Coast Highway at Loynes Drive	Long Beach/ Caltrans	AM PM	5Ø Traffic Signal	0.677 0.809	B D
12. Studebaker Road at Loynes Drive	Long Beach	AM PM	3Ø Traffic Signal	0.675 0.791	B C
13. Livingston Drive at 2nd Street	Long Beach	AM PM	3Ø Traffic Signal	0.624 0.583	B A

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards
- s/v = seconds per vehicle

TABLE 3-5 (CONTINUED)
EXISTING PEAK HOUR LEVELS OF SERVICE

Key Intersection	Jurisdiction	Time Period	Control Type	ICU/HCM	LOS
14. Bay Shore Avenue at 2nd Street	Long Beach	AM	3Ø Traffic	0.847	D
		PM	Signal	1.009	F
15. Naples Plaza at 2nd Street	Long Beach	AM	3Ø Traffic	0.699	B
		PM	Signal	0.746	C
16. Marina Drive at 2nd Street	Long Beach	AM	6Ø Traffic	0.664	B
		PM	Signal	0.792	C
17. Pacific Coast Highway at 2nd Street	Long Beach/ Caltrans	AM	8Ø Traffic	0.933	E
		PM	Signal	0.876	D
18. Shopkeeper Road at 2nd Street	Long Beach	AM	5Ø Traffic	0.648	B
		PM	Signal	0.881	D
19. Studebaker Road at 2nd Street	Long Beach	AM	3Ø Traffic	0.857	D
		PM	Signal	0.947	E
20. Seal Beach Boulevard at Westminster Avenue	Seal Beach	AM	8Ø Traffic	0.936	E
		PM	Signal	0.929	E
21. Marina Drive at Studebaker Road	Long Beach	AM	All-Way	11.9 s/v	B
		PM	Stop	15.8 s/v	C
22. Pacific Coast Highway at Studebaker Rd	Long Beach/ Caltrans	AM	6Ø Traffic	0.797	C
		PM	Signal	0.840	D
23. Pacific Coast Highway at Marina Drive	Seal Beach/ Caltrans	AM	One-Way	36.5 s/v	E
		PM	Stop	19.9 s/v	C
24. Pacific Coast Highway at Main/Bolsa Avenue	Seal Beach/ Caltrans	AM	5Ø Traffic	0.730	C
		PM	Signal	0.702	C
25. Seal Beach Boulevard at Pacific Coast Highway	Seal Beach/ Caltrans	AM	6Ø Traffic	0.885	D
		PM	Signal	0.811	D
26. Seal Beach Boulevard at Bolsa Avenue	Seal Beach	AM	6Ø Traffic	0.548	A
		PM	Signal	0.492	A

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards
- s/v = seconds per vehicle

TABLE 3-5 (CONTINUED)
EXISTING PEAK HOUR LEVELS OF SERVICE

Key Intersection	Jurisdiction	Time Period	Control Type	ICU/HCM	LOS
27. Santiago Avenue at 7th Street	Long Beach	AM	3Ø Traffic	0.674	B
		PM	Signal	0.729	C
28. Pacific Coast Highway at Channel Drive	Long Beach/ Caltrans	AM	3Ø Traffic	0.518	A
		PM	Signal	0.524	A
29. Pacific Coast Highway at 1st Street	Seal Beach/ Caltrans	AM	6Ø Traffic	0.699	B
		PM	Signal	0.758	C
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	Long Beach/ Caltrans	AM	One-Way	15.2 s/v	C
		PM	Stop	26.7 s/v	D
31. 1st Street at Marina Drive	Seal Beach	AM	All-Way	9.2 s/v	A
		PM	Stop	11.3 s/v	B

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards
- s/v = seconds per vehicle

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 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.

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 9th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2012].

Table 5-1 summarizes the trip generation rates and equations used in forecasting the vehicular trips generated by the proposed Project and the existing land use (i.e. Seaport Marina Hotel). For this analysis, the trip generation potential of the existing Seaport Marina Hotel was estimated using ITE Land Use 310: Hotel trip rates, however only the rooms that are currently in operation were used to establish the site's trip budget (i.e. 170 rooms). The trip generation potential of the proposed Project was estimated using ITE Land Use 820: Shopping Center trip equations, ITE Land Use 931: Quality Restaurant trip rates and ITE Land Use 932: High-Turnover (Sit-Down) Restaurant trip rates. It should be noted that the retail project component (i.e. 95,000 SF), grocery store project component (i.e. 55,000 SF), ready to eat restaurant project component (i.e. 5,000 SF) and health club project component (i.e. 25,000 SF) were included under ITE Land Use 820, per the ITE definition of a shopping center. Although restaurant land uses are also included under the ITE shopping center definition, traffic associated with the proposed restaurant floor area was forecast separately to provide a conservative trip generation forecast.

Table 5-2 summarizes the Project's trip generation forecast for a typical weekday and weekend day (Saturday). Review of the top portion of **Table 5-2** shows that the existing Seaport Marina Hotel currently generates 1,389 weekday daily trips, 90 weekday AM peak hour trips, 102 weekday PM peak hour trips, 1,392 weekend day (Saturday) daily trips and 122 weekend day (Saturday) Midday peak hour trips. Please note that the trip generation for the existing Seaport Marina Hotel is based upon the number of rooms currently in operation. Based on information provided by the hotel operator, the existing hotel currently has 170 rooms in operation out of a possible 248 rooms. Therefore, the trip generation for the existing land use is based upon 170 rooms.

Review of the middle portion of **Table 5-2** shows that the proposed Project, prior to taking credit for the existing land use is forecast to generate 15,055 weekday daily trips, 502 weekday AM peak hour trips (289 inbound, 213 outbound), 894 weekday PM peak hour trips (478 inbound, 416 outbound), 19,003 weekend day (Saturday) daily trips and 1,561 weekend day (Saturday) Midday peak hour trips (838 inbound, 723 outbound).

Please note that the aforementioned overall project trip generation includes adjustments for pass-by as recommended by ITE. The pass-by reduction factors used in this report, which are summarized in the footnotes of **Table 5-2**, are based on information published in the *Trip Generation Handbook*, published by ITE (2012) and input from the City of Long Beach Traffic Engineer.

TABLE 5-1
PROJECT TRAFFIC GENERATION RATES AND EQUATIONS⁷

ITE Land Use Code/Description	Time Period	Rates/Equations	Percent Entering	Percent Exiting
<ul style="list-style-type: none"> ▪ 310: Hotel (TE/Room) 	Daily	$T = 8.17 (X)$	50%	50%
	AM Peak	$T = 0.53 (X)$	59%	41%
	PM Peak	$T = 0.60 (X)$	51%	49%
	Saturday Daily	$T = 8.19 (X)$	50%	50%
	Saturday Midday	$T = 0.72 (X)$	56%	44%
<ul style="list-style-type: none"> ▪ 820: Shopping Center (TE/1,000SF) 	Daily	$LN (T) = 0.65 LN(X) + 5.83$	50%	50%
	AM Peak	$LN (T) = 0.61 LN(X) + 2.24$	62%	38%
	PM Peak	$LN (T) = 0.67 LN (X) + 3.31$	48%	52%
	Saturday Daily	$LN (T) = 0.63 LN(X) + 6.23$	50%	50%
	Saturday Midday	$LN (T) = 0.65 LN(X) + 3.78$	52%	48%
<ul style="list-style-type: none"> ▪ 931: Quality Restaurant (TE/1,000 SF) 	Daily	$T = 89.95 (X)$	50%	50%
	AM Peak	$T = 0.81 (X)$	50%	50%
	PM Peak	$T = 7.49 (X)$	67%	33%
	Saturday Daily	$T = 94.36 (X)$	50%	50%
	Saturday Midday	$T = 10.82 (X)$	59%	41%
<ul style="list-style-type: none"> ▪ 932: High-Turnover (Sit-Down) Restaurant (TE/1,000 SF) 	Daily	$T = 127.15 (X)$	50%	50%
	AM Peak	$T = 10.81 (X)$	55%	45%
	PM Peak	$T = 9.85 (X)$	60%	40%
	Saturday Daily	$T = 158.37 (X)$	50%	50%
	Saturday Midday	$T = 14.07 (X)$	53%	47%

⁷ Source: *Trip Generation*, 9th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).

TABLE 5-2
PROJECT TRAFFIC GENERATION FORECAST⁸

Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour			Saturday Midday			
		Enter	Exit	Total	Enter	Exit	Total	Daily	Enter	Exit	Total
<u>Existing Land Use:</u>											
▪ Hotel (170 Rooms)	1,389	53	37	90	52	50	102	1,392	68	54	122
<u>Proposed Project Uses:</u>											
▪ Retail (180,000 SF)	9,951	138	85	223	426	462	888	13,381	666	615	1,281
Pass-By Reduction ⁹	<u>-995</u>	<u>-14</u>	<u>-9</u>	<u>-23</u>	<u>-145</u>	<u>-157</u>	<u>-302</u>	<u>-1,338</u>	<u>-173</u>	<u>-160</u>	<u>-333</u>
Subtotal	8,956	124	76	200	281	305	586	12,043	493	455	948
▪ Quality Restaurant (40,000 SF)	3,598	16	16	32	201	99	300	3,774	255	178	433
Pass-By Reduction ⁹	<u>-360</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>-88</u>	<u>-44</u>	<u>-132</u>	<u>-377</u>	<u>-56</u>	<u>-39</u>	<u>-95</u>
Subtotal	3,238	16	16	32	113	55	168	3,397	199	139	338
▪ High-Turnover Restaurant (25,000 SF)	3,179	149	121	270	148	98	246	3,959	187	165	352
Pass-By Reduction ⁹	<u>-318</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>-64</u>	<u>-42</u>	<u>-106</u>	<u>-396</u>	<u>-41</u>	<u>-36</u>	<u>-77</u>
Subtotal	2,861	149	121	270	84	56	140	3,563	146	129	275
Total Project Trip Generation	15,055	289	213	502	478	416	894	19,003	838	723	1,561
Less Existing Trip Generation	-1,389	-53	-37	-90	-52	-50	-102	-1,392	-68	-54	-122
Total Net Project Trip Generation	13,666	236	176	412	426	366	792	17,611	770	669	1,439

⁸ Source: *Trip Generation*, 9th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).

⁹ Source: *Trip Generation Handbook*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2012)]. Pass-by reductions for the retail, quality restaurant and high-turnover restaurant project uses are as follows:

- Retail: Weekday (Daily: 10%, AM: 10% and PM: 34%); Weekend (Daily: 10% and Midday: 26%)
- Quality Restaurant: Weekday (Daily: 10%, AM: 0% and PM: 44%); Weekend (Daily: 10% and Midday: 22%)
- High-Turnover Restaurant: Weekday (Daily: 10%, AM: 0% and PM: 43%); Weekend (Daily: 10% and Midday: 22%)

Review of the lower portion of *Table 5-2* (i.e. row showing the “Total Net Project Trip Generation”) shows that with application of existing trip credits, the proposed Project is forecast to generate a net of 13,666 weekday daily trips, 412 weekday AM peak hour trips (236 inbound, 176 outbound), 792 weekday PM peak hour trips (426 inbound, 366 outbound), 17,611 weekend day (Saturday) daily trips and 1,439 weekend day (Saturday) Midday peak hour trips (770 inbound, 669 outbound). The potential traffic impacts of the aforementioned net Project trips are evaluated in the traffic impact analysis section of this report.

5.2 Project Traffic Distribution and Assignment

Figure 5-1 presents the general directional as well as the detailed intersection distribution pattern for the proposed Project, respectively. 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:

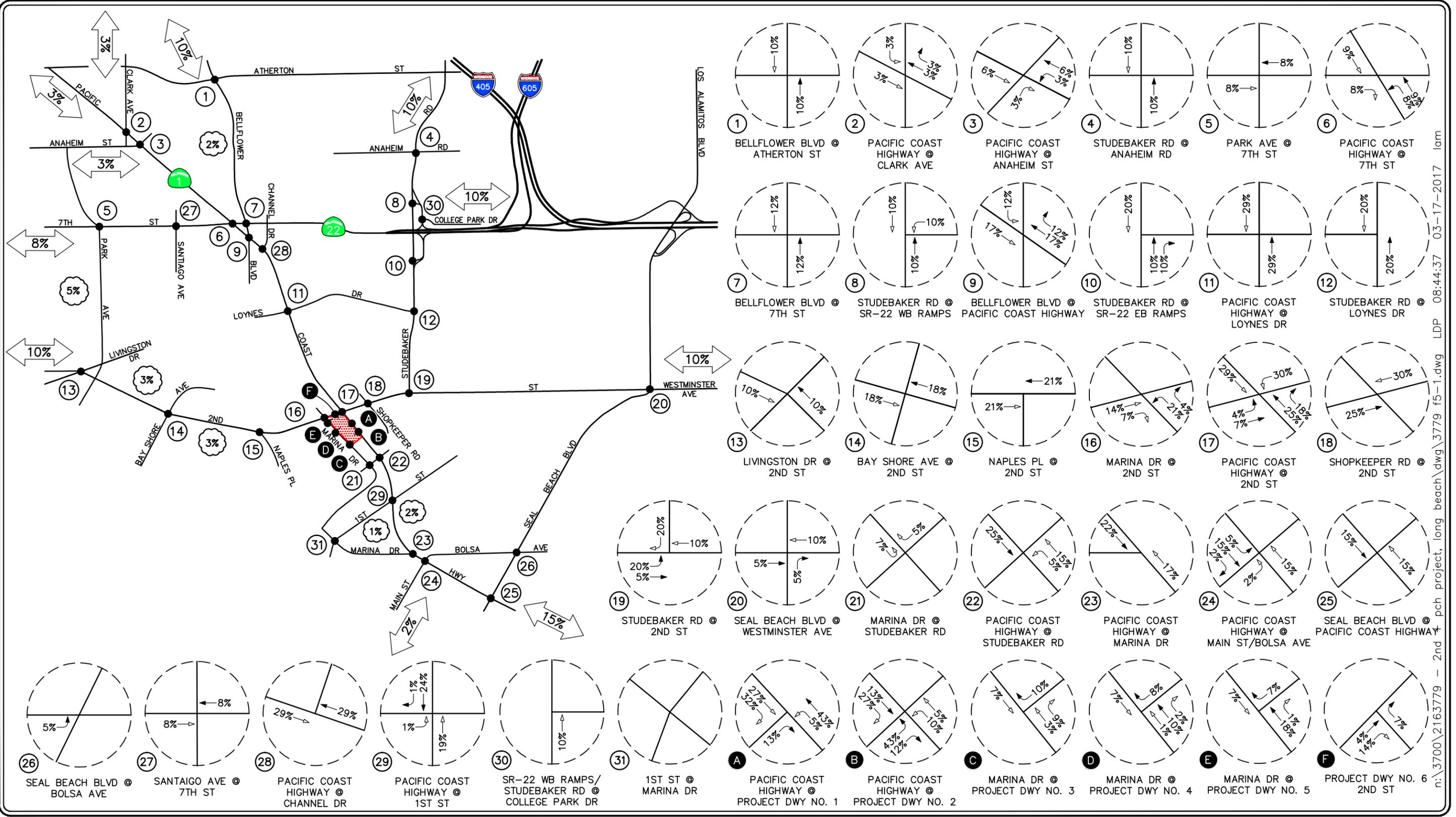
- the site's proximity to major traffic carriers (i.e. 2nd Street, Pacific Coast Highway, etc).
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals,
- ingress/egress availability at the project site and the location of proposed parking areas, and
- input from City staff.

The anticipated AM, PM and Saturday Midday peak hour project traffic volumes associated with the proposed Project are presented in *Figures 5-2, 5-3* and *5-4*, respectively. The traffic volume assignments presented in *Figures 5-2, 5-3* and *5-4* reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-2*.

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 pursuant to the California Environmental Quality Act (CEQA) guidelines, which require that the potential impacts of a Project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

Figures 5-5, 5-6 and *5-7* present projected AM, PM and Saturday Midday peak hour traffic volumes at the thirty-one (31) key study intersections with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively.



KEY

- ⊙ = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- ↔ = DIRECTIONAL DISTRIBUTION
- ▨ = PROJECT SITE

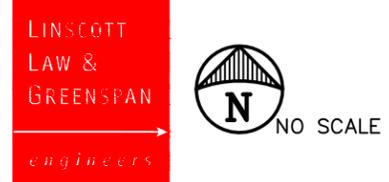
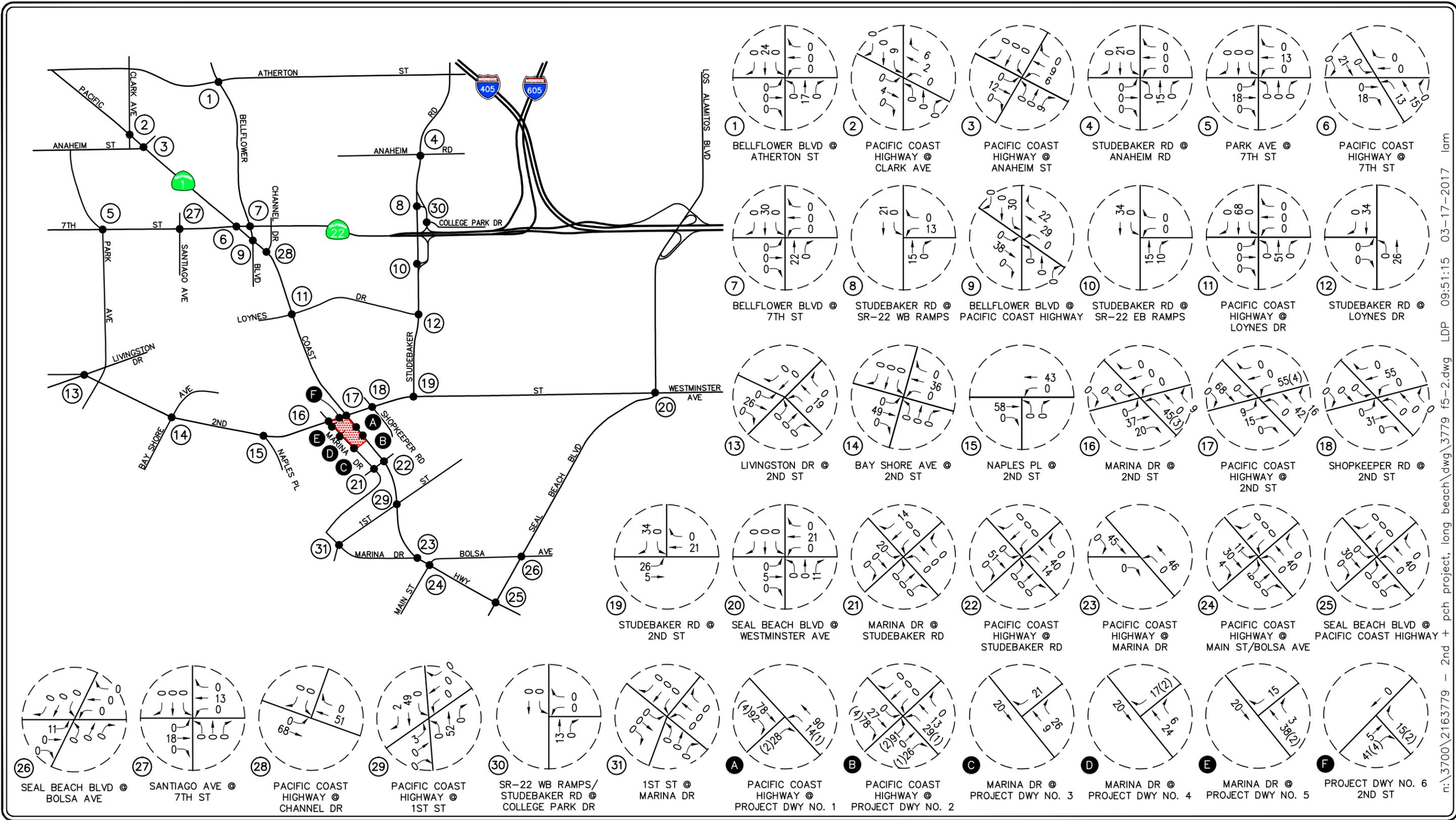


FIGURE 5-1
PROJECT TRAFFIC DISTRIBUTION PATTERN
 2ND + PCH PROJECT, LONG BEACH

n:\3700\2163779 - 2nd pch project, long beach\dwg\3779 f5-1.dwg LDP 08:44:37 03-17-2017 lam



n:\3700\2163779 - 2nd pch project, long beach\dwg\3779 f5-2.dwg LDP 09:51:15 03-17-2017 lam

KEY
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 XXX(XXX) = PROJECT TRIPS (PASS-BY TRIPS)
 = PROJECT SITE

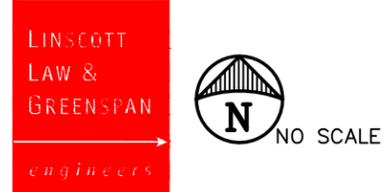
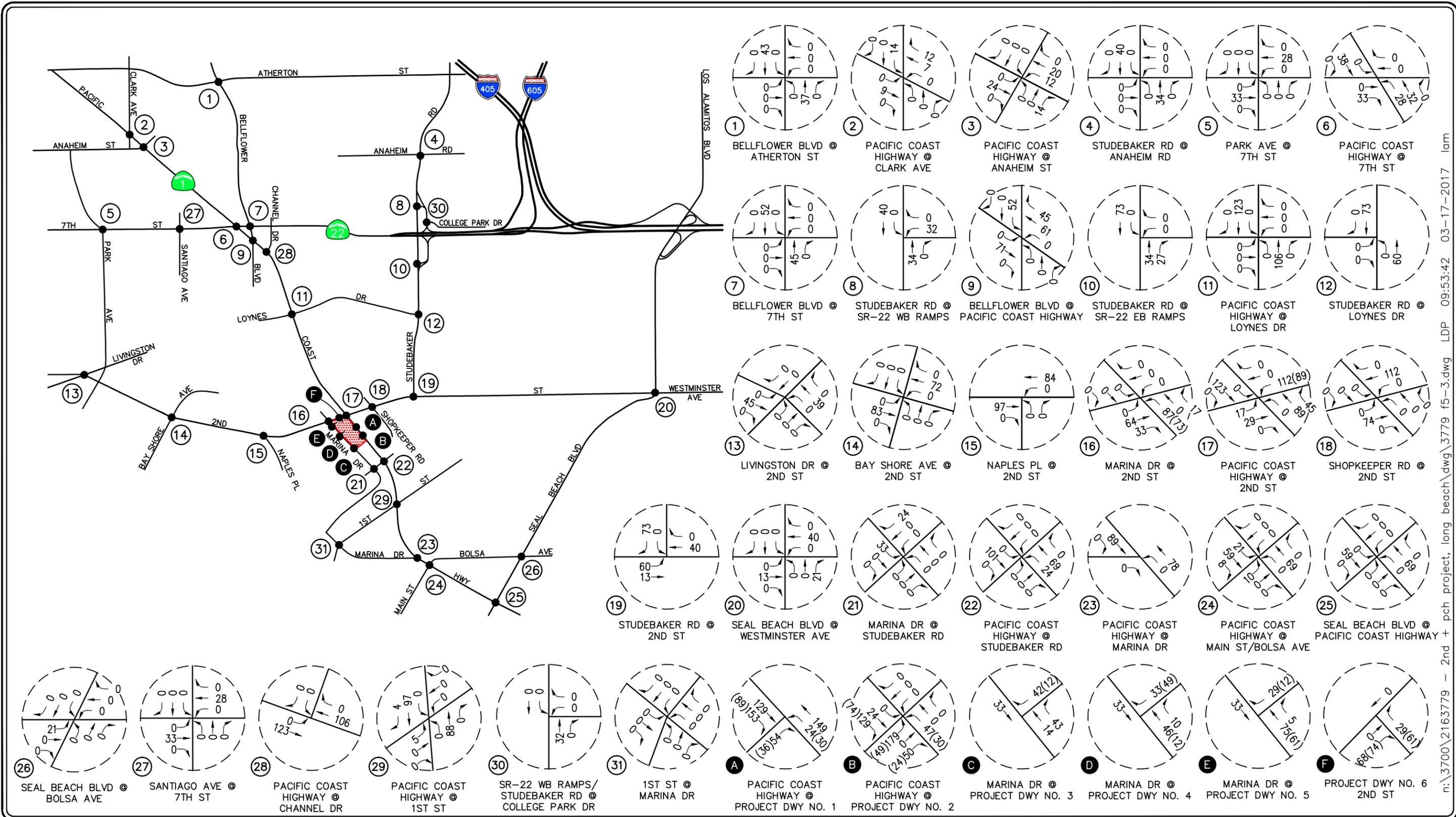
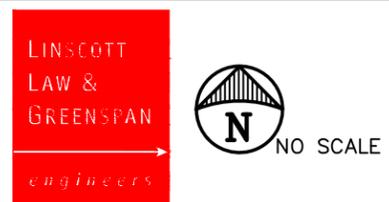


FIGURE 5-2
AM PEAK HOUR PROJECT TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

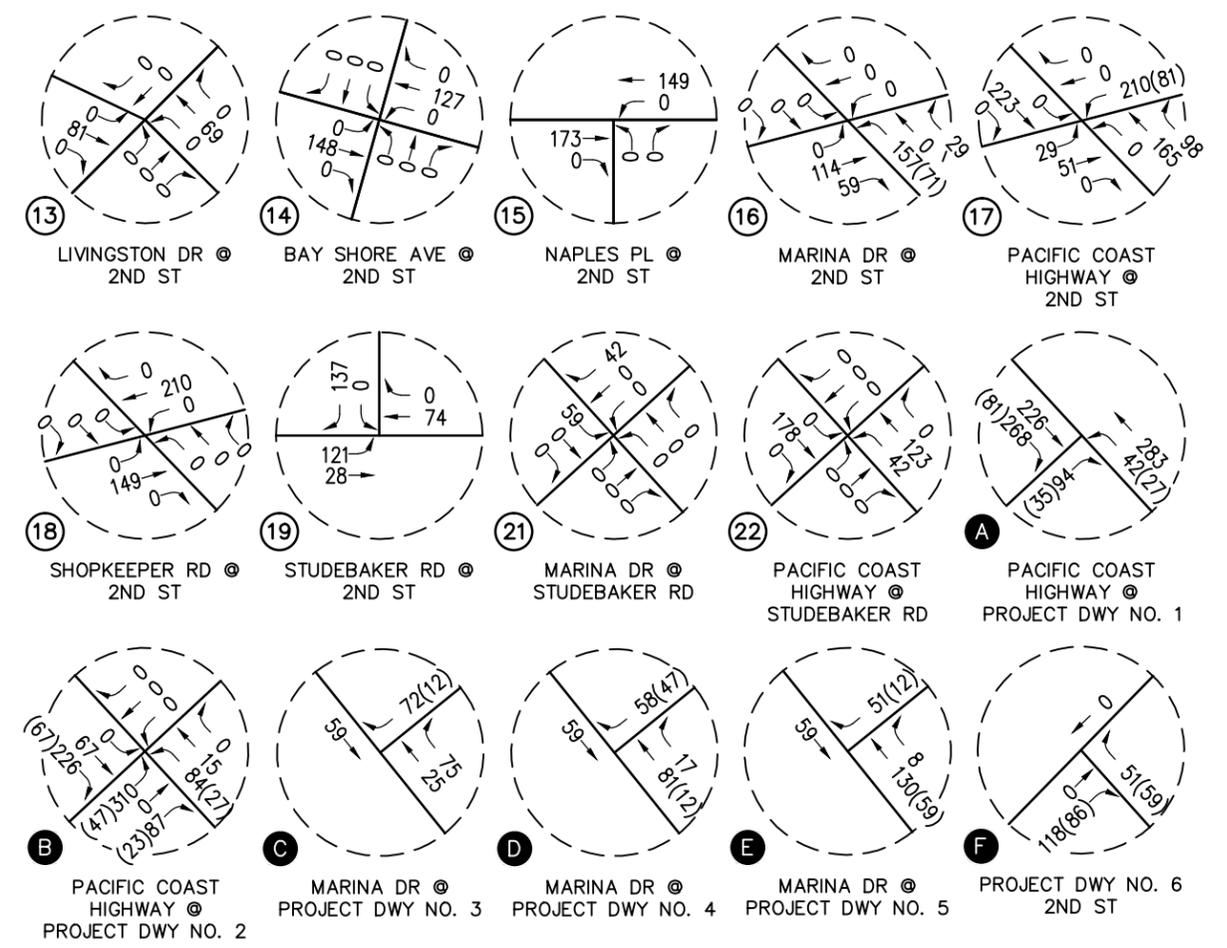
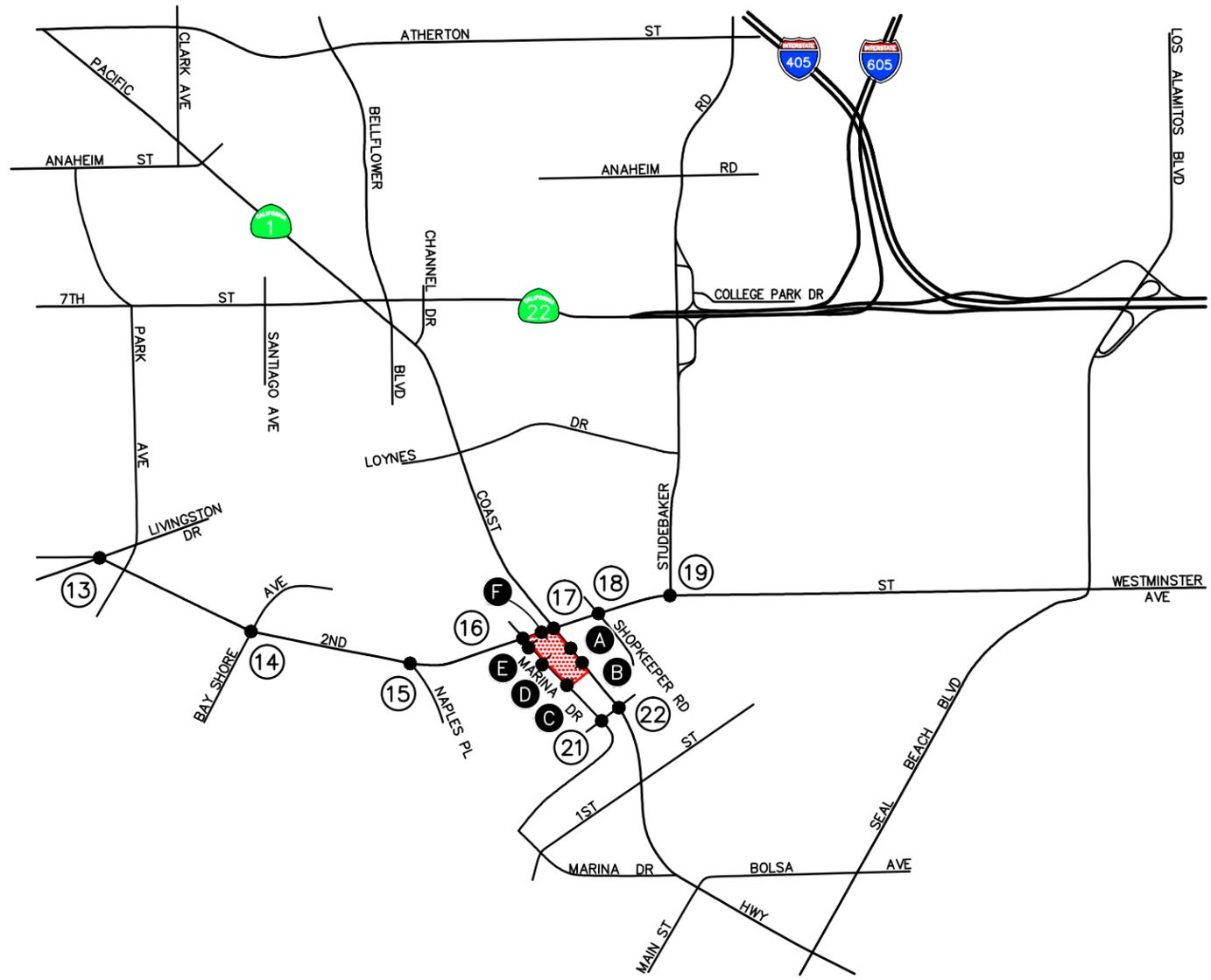


n:\3700\2163779 - 2nd pch project, long beach\dwg\3779 f5-3.dwg LDP 09:53:42 03-17-2017 lam



KEY
 # = STUDY INTERSECTION
 XXX(XXX) = PROJECT TRIPS (PASS-BY TRIPS)
 = PROJECT SITE

FIGURE 5-3
 PM PEAK HOUR PROJECT TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH



KEY

= STUDY INTERSECTION

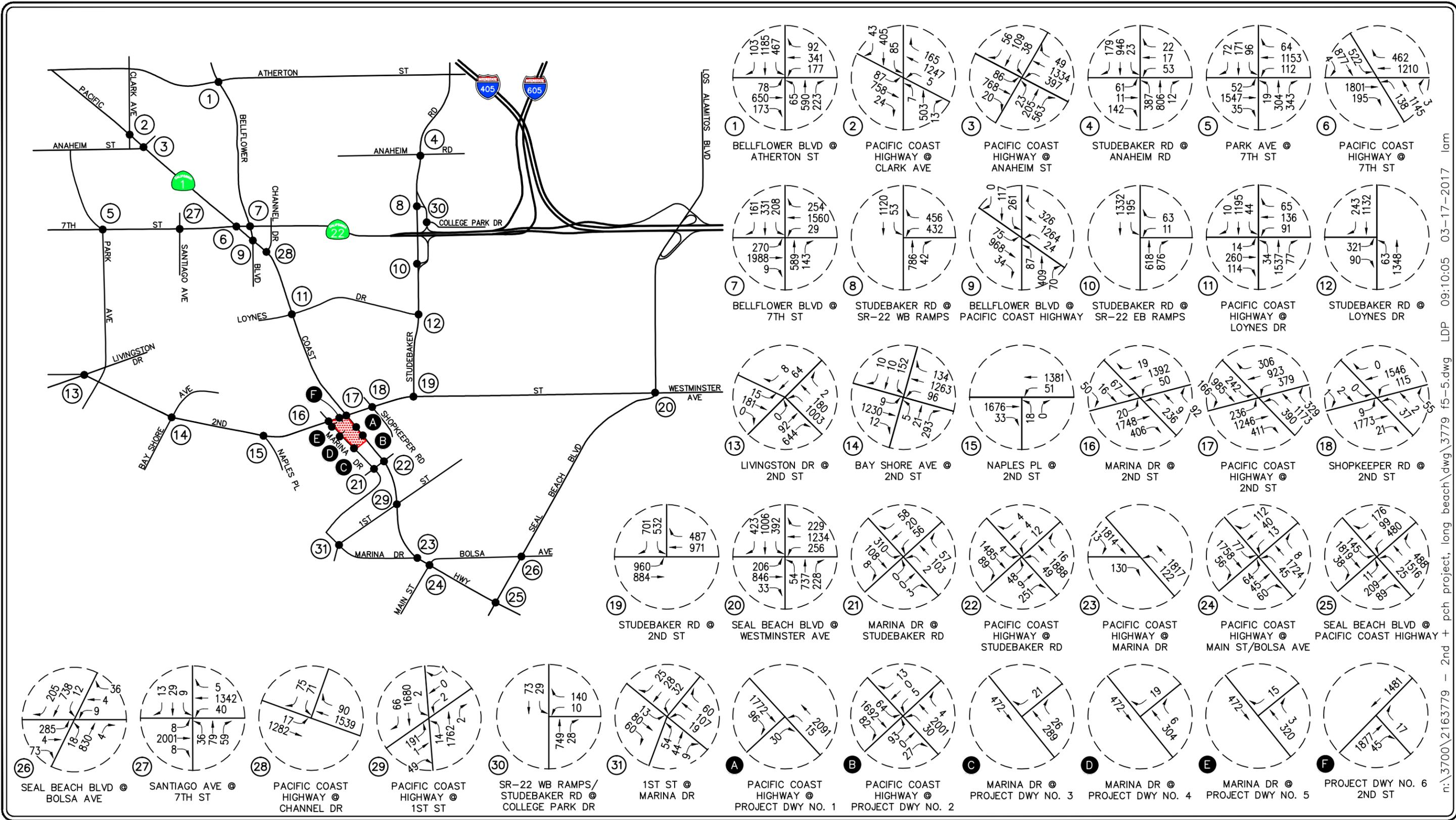
XXX(XXX) = PROJECT TRIPS (PASS-BY TRIPS)

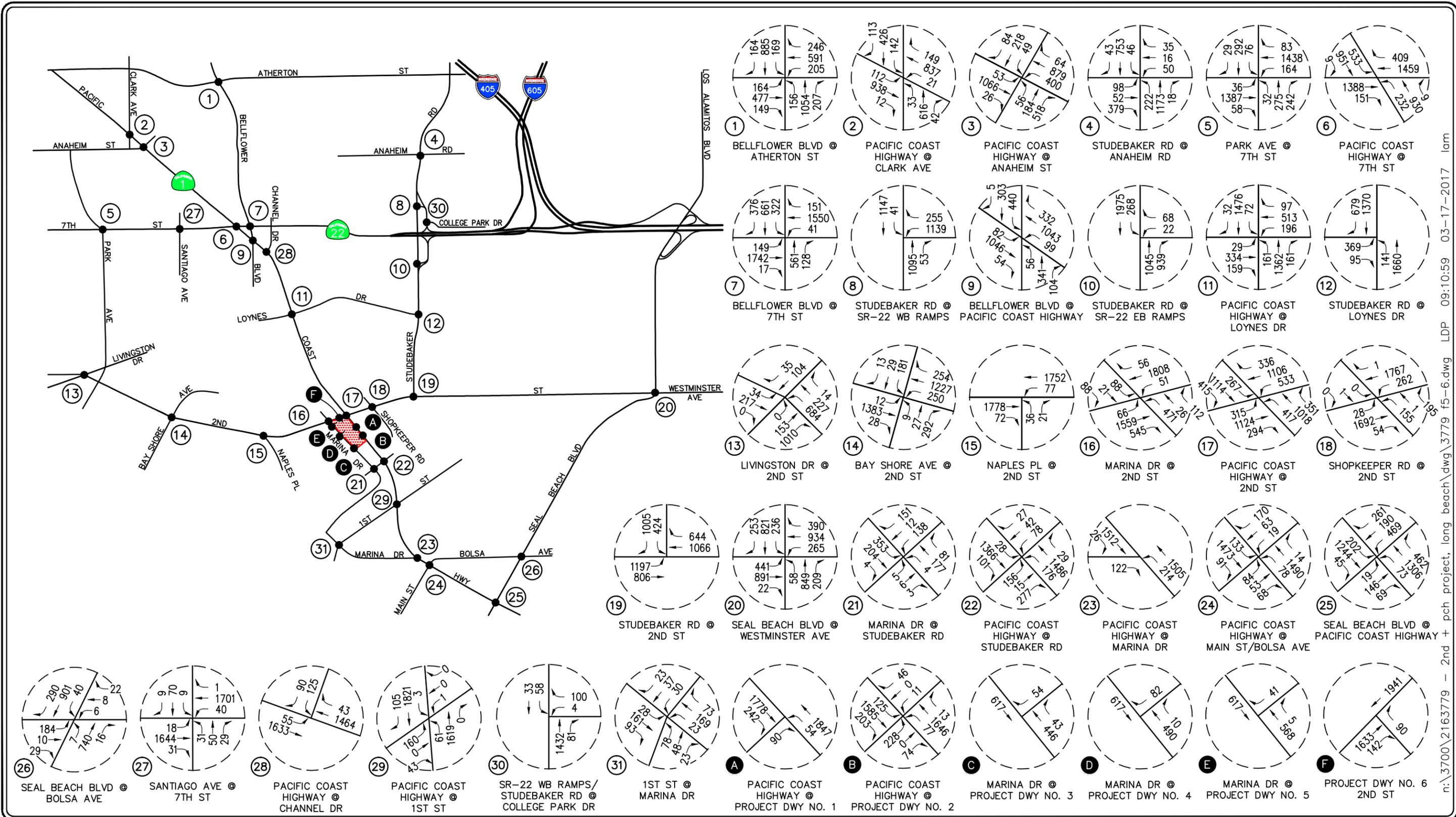
[Red Hatched Box] = PROJECT SITE

FIGURE 5-4

SATURDAY PEAK HOUR PROJECT TRAFFIC VOLUMES
2ND + PCH PROJECT, LONG BEACH

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n:\3700\2163779 - 2nd + pch project, long beach\dwg\3779 f5-6.dwg LDP 09:10:59 03-17-2017 lam

KEY

= STUDY INTERSECTION

= PROJECT SITE

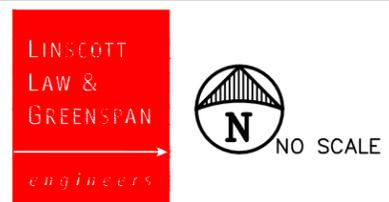
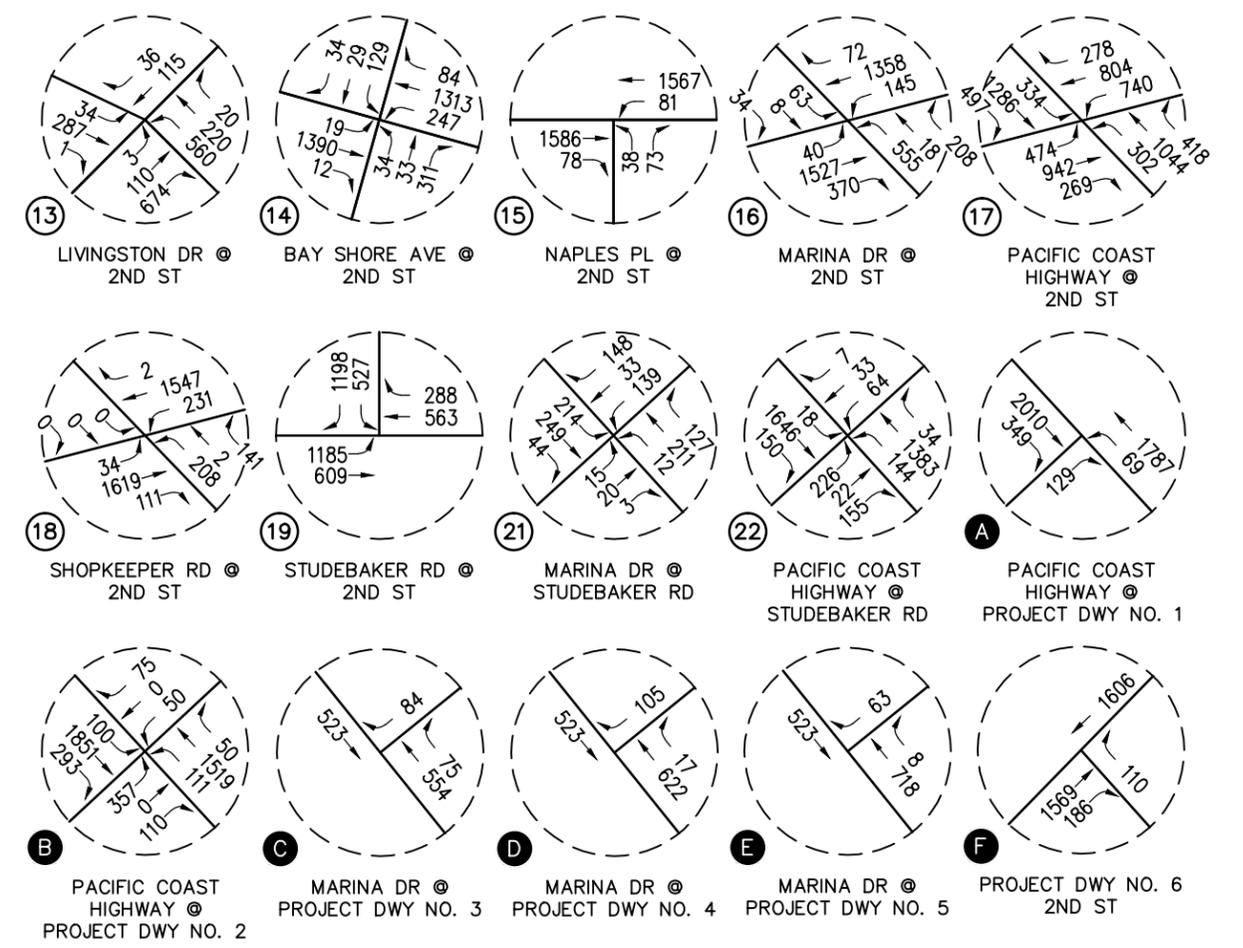
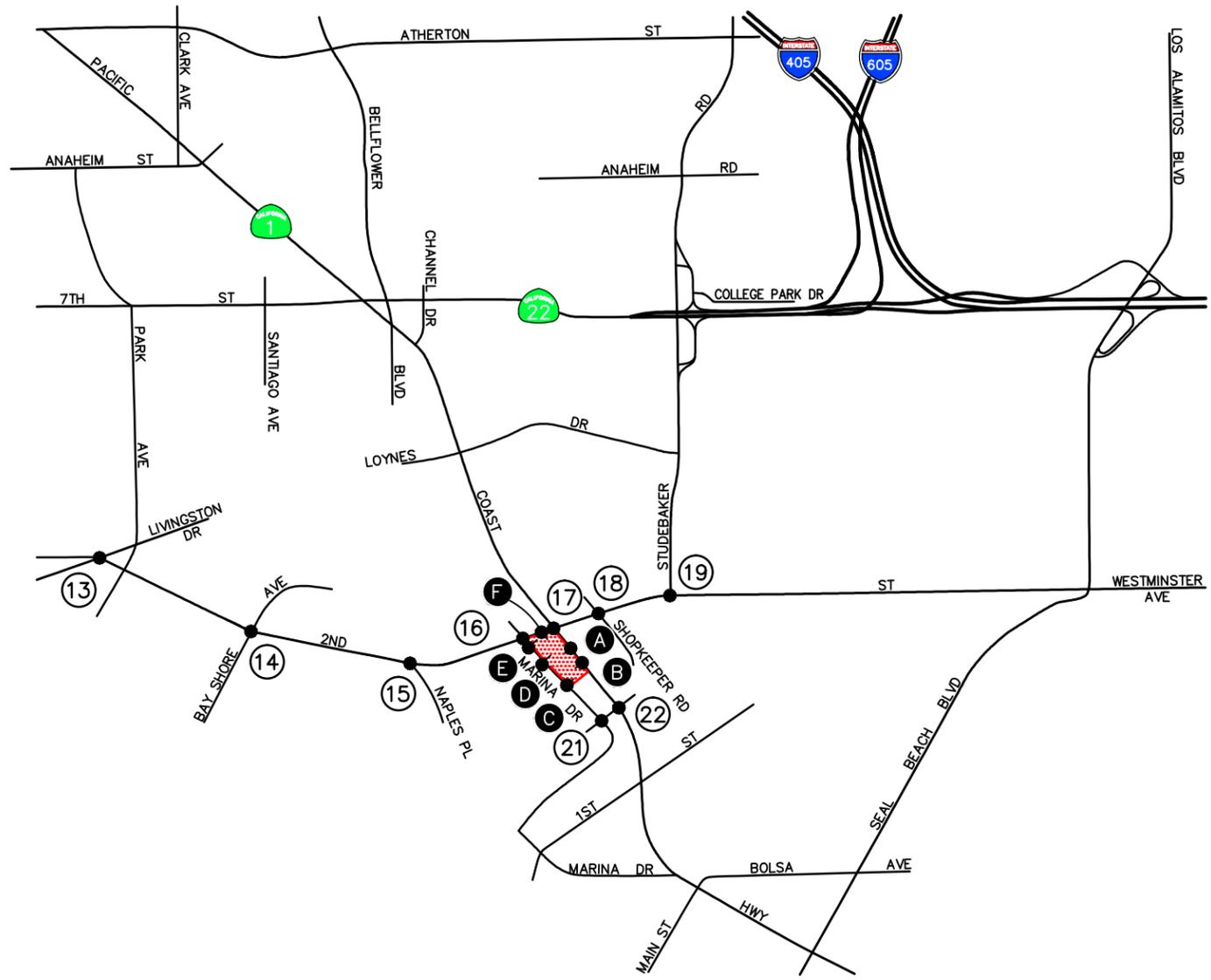


FIGURE 5-6

EXISTING PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

2ND + PCH PROJECT, LONG BEACH



KEY
 # = STUDY INTERSECTION
 [Red Hatched Box] = PROJECT SITE

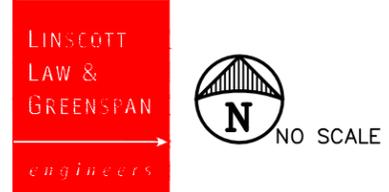


FIGURE 5-7

EXISTING PLUS PROJECT SATURDAY PEAK HOUR TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

n:\3700\2163779 - 2nd + pch project, long beach\dwg\3779 f5-7.dwg LDP 09:11:49 03-17-2017 lam

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Cumulative traffic growth estimates have been calculated using an ambient growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative 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%) per year. Applied to existing Year 2016 traffic volumes results in a three percent (3%) increase of growth in existing volumes to horizon year 2019.

Please note that the recommended ambient growth factor is generally consistent with the background traffic growth estimates contained in the most current *Congestion Management Program for Los Angeles County*. It should be further noted that the 1.0% per year ambient growth factor was approved by City of Long Beach staff.

6.2 Cumulative Projects Traffic Characteristics

The City of Long Beach identified four (4) cumulative projects and the City of Seal Beach identified two (2) cumulative projects within the Project study area. Cumulative projects, as defined by Section 15355 of the CEQA Guidelines, are “closely related past, present and reasonably foreseeable probable future projects”. The Traffic Impact Analysis assumes that all of these cumulative projects will be developed and operational when the proposed Project is operational. This is the most conservative, worst-case approach, since the exact timing of each cumulative project is uncertain. In addition, impacts for these cumulative projects would likely be, or have been, subject to mitigation measures, which could reduce potential impacts. Under this analysis, however, those mitigation measures are not considered. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development. These six (6) cumulative projects have been included as part of the cumulative background setting.

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

Table 6-2 presents the resultant trip generation for the six (6) cumulative projects. As shown in **Table 6-2**, the six (6) cumulative projects are expected to generate a combined total of 6,390 weekday daily trips, 560 weekday AM peak hour trips (263 inbound and 297 outbound), 624 weekday PM peak hour trips (316 inbound and 308 outbound), 11,435 weekend day (Saturday) daily trips and 1,157 weekend day (Saturday) Midday peak hour trips (742 inbound, 415 outbound).

The AM, PM and Saturday Midday peak hour traffic volumes associated with the six (6) cumulative projects are presented in **Figures 6-2, 6-3** and **6-4**, respectively.

TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS¹⁰

No.	Cumulative Project	Location	Description
<u>City of Long Beach</u>			
1.	AES Battery Energy Storage System	690 Studebaker Road	300-megawatt battery energy storage system facility which consists of three (3) buildings and ancillary facilities totaling 400,950 SF
2.	Belmont Pool Revitalization Project ¹¹	4000 E. Olympic Plaza	125,500 SF pool complex that includes indoor and outdoor pool components, 1,500 SF outdoor café, indoor seating for approximately 1,250 spectators and outdoor seating for 3,000 spectators
3.	5744 E. 2 nd Street Retail	5744 E. 2 nd Street	1,122 SF commercial
4.	Los Cerritos Wetlands Restoration and Oil Consolidation Project	Four sites located at 6422 E 2 nd Street, 6701 E. Pacific Coast Highway, NE Corner of Studebaker Road and 2 nd Street, and Shopkeeper Road at 2 nd Street	Establish a wetlands mitigation bank and public access trail on the northerly 78-acres of the Synergy Oil Field property, construct a 5,200 SF office building and 9,750 SF storage/warehouse building on the Pumpkin Patch site, and develop oil wells on the LCWA site and City property site.
<u>City of Seal Beach</u>			
5.	Ocean Place Residential Project ¹²	1 st Street and Marina Drive	48 DU single-family homes and 6.4 acre neighborhood park
6.	Main and PCH Mixed-Use Center Project ¹³	350 Main Street	6,808 SF retail, 5,593 SF office, 999 SF dessert/café, and 1,600 SF dojo

¹⁰ Source: City of Long Beach and City of Seal Beach Planning Departments.

¹¹ Source: *Draft Environmental Impact Report for the Belmont Pool Revitalization Project*, dated April 2016.

¹² Source: *Traffic Impact Analysis Report for the Ocean Place Residential Project*, dated October 27, 2011, prepared by LLG.

¹³ Source: *Revised Addendum to the Traffic Impact Analysis Report for the Main & PCH Mixed-Use Center Project (dated April 20, 2013)*, dated September 27, 2016, prepared by LLG.

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST¹⁴

Cumulative Projects Description	Daily 2-Way	AM Peak Hour			PM Peak Hour			Saturday Midday			
		Enter	Exit	Total	Enter	Exit	Total	Daily	Enter	Exit	Total
1. AES Battery Energy Storage System	1,427	95	25	120	32	96	128	493	33	19	52
2. Belmont Pool Revitalization Project	3,300 ¹⁵	100	200	300	200	130	330	9,000 ¹⁵	600	300	900
3. 5744 E. 2 nd Street Retail	36	1	0	1	1	2	3	42	2	2	4
4. Los Cerritos Wetlands Restoration and Oil Consolidation Project ¹⁶	482	34	28	62	20	26	46	415	20	18	38
5. Ocean Place Residential Project ¹⁷	561	13	34	47	36	21	57	847	48	35	83
6. Main and PCH Mixed-Use Center Project ¹⁸	584	20	10	30	27	33	60	638	39	41	80
Total Cumulative Projects Trip Generation Potential	6,390	263	297	560	316	308	624	11,435	742	415	1,157

¹⁴ Unless otherwise noted, Source: *Trip Generation*, 9th Edition, Institute of Transportation Engineers (ITE) [Washington, D.C. (2012)].

¹⁵ Source: *Draft Environmental Impact Report for the Belmont Pool Revitalization Project*, dated April 2016. No data is provided for the Daily trips, therefore, the daily trips were assumed to be equal to PM/Saturday Midday peak hour multiplied by a factor of 10.

¹⁶ Public access trail trips on the northern 78-acre portion of the Synergy Oil Field Property was forecasted using the *(Not So) Brief Guide of Vehicle Traffic Generation Rates for the San Diego Area* published by SANDAG (April 2002).

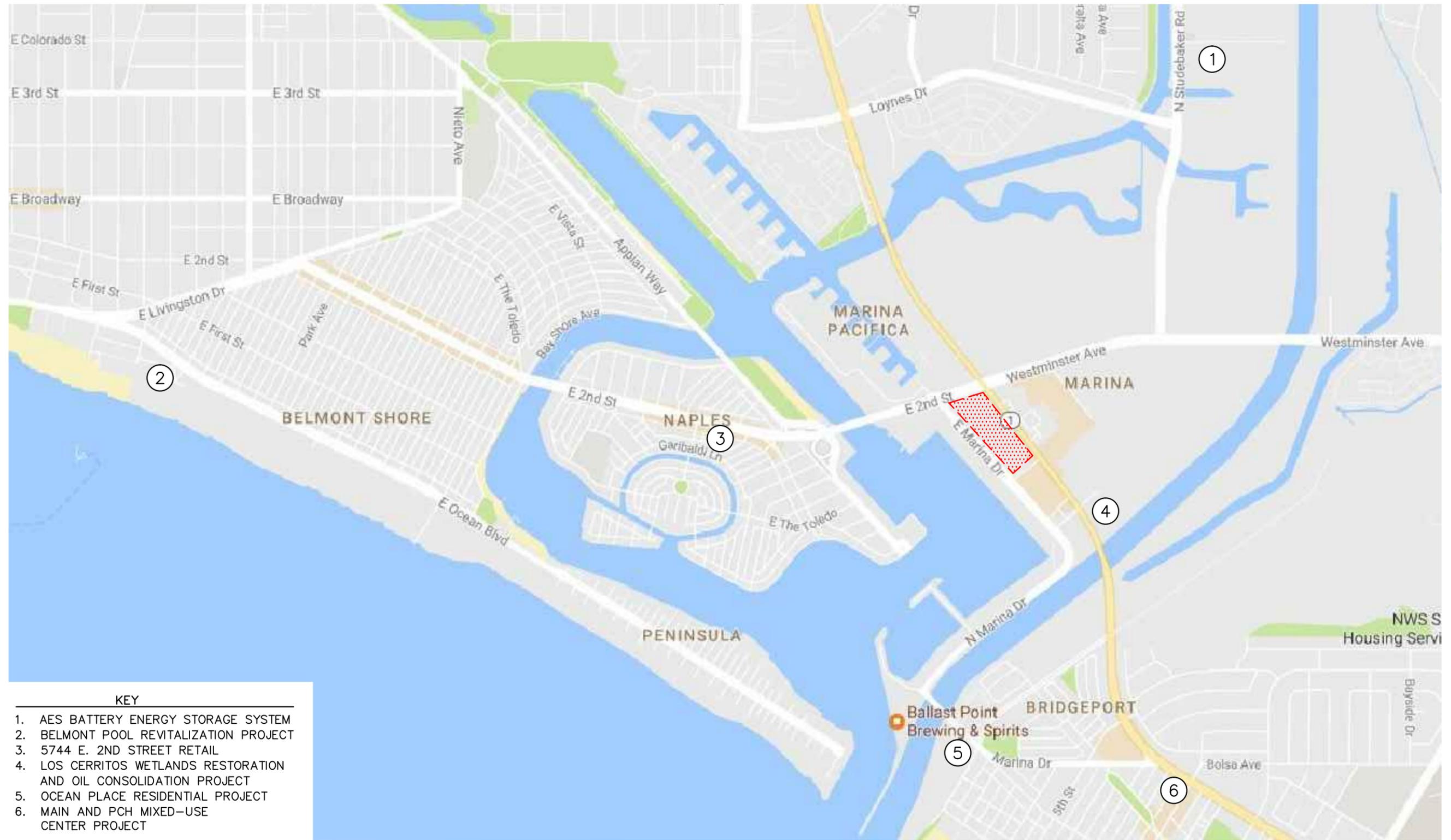
¹⁷ Source: *Traffic Impact Analysis Report for the Ocean Place Residential Project*, dated October 27, 2011, prepared by LLG.

¹⁸ Source: *Revised Addendum to the Traffic Impact Analysis Report for the Main & PCH Mixed-Use Center Project (dated April 20, 2013)*, dated September 27, 2016, prepared by LLG.

6.3 Year 2019 Traffic Volumes

Figures 6-5, 6-6 and 6-7 present future AM, PM and Saturday Midday peak hour cumulative traffic volumes at the thirty-one (31) key study intersections for the Year 2019, respectively. Please note that the cumulative traffic volumes represent the accumulation of existing traffic, ambient growth traffic and cumulative projects traffic.

Figures 6-8, 6-9 and 6-10 illustrate Year 2019 forecast AM, PM and Saturday Midday peak hour traffic volumes with the inclusion of the trips generated by the proposed Project, respectively.



KEY

- 1. AES BATTERY ENERGY STORAGE SYSTEM
- 2. BELMONT POOL REVITALIZATION PROJECT
- 3. 5744 E. 2ND STREET RETAIL
- 4. LOS CERRITOS WETLANDS RESTORATION AND OIL CONSOLIDATION PROJECT
- 5. OCEAN PLACE RESIDENTIAL PROJECT
- 6. MAIN AND PCH MIXED-USE CENTER PROJECT

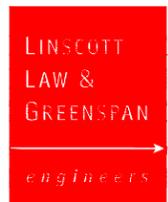
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KEY

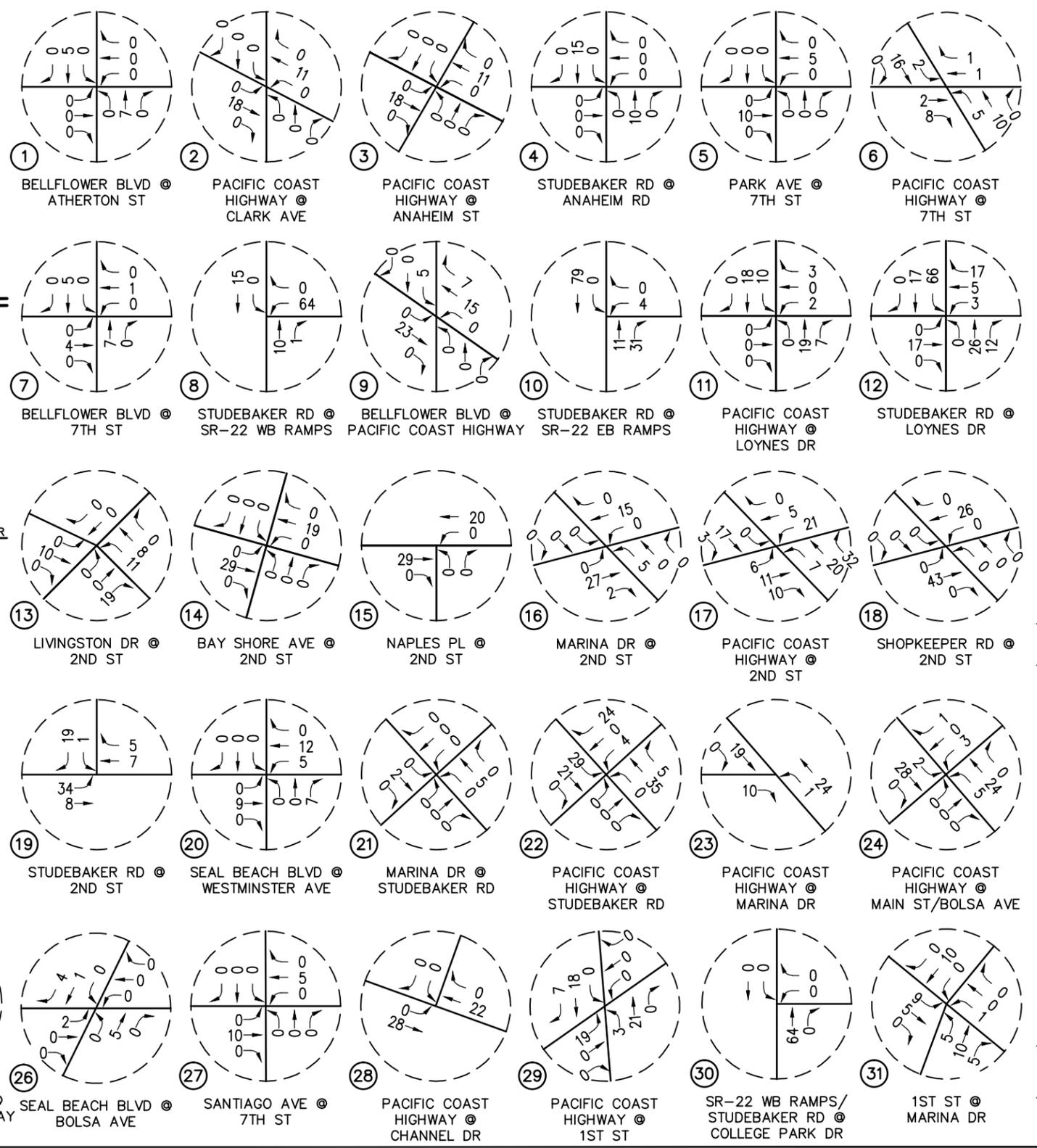
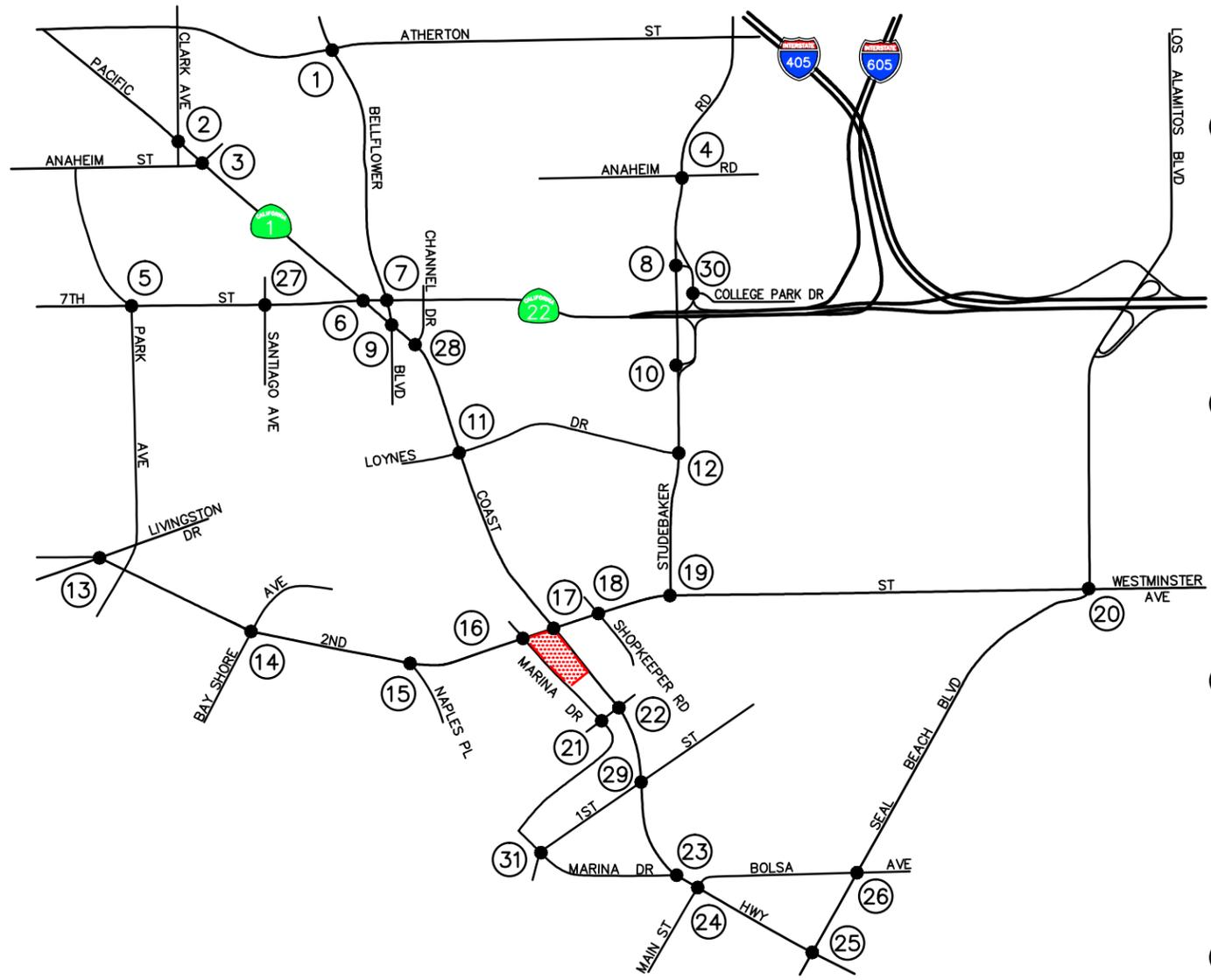
- = LOCATION OF CUMULATIVE PROJECT
- = PROJECT SITE

FIGURE 6-1

CUMULATIVE PROJECT LOCATION MAP
2ND + PCH PROJECT, LONG BEACH



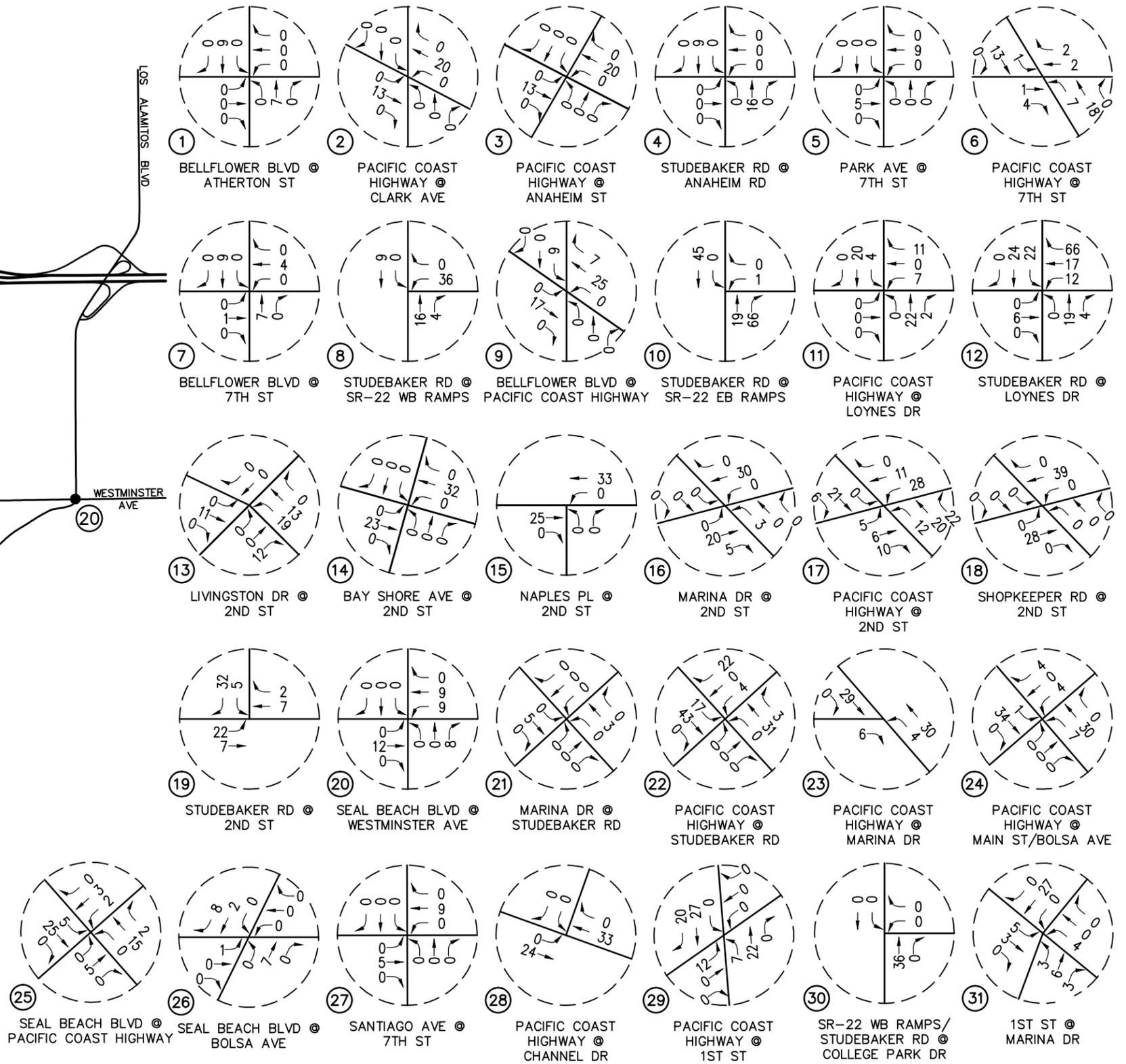
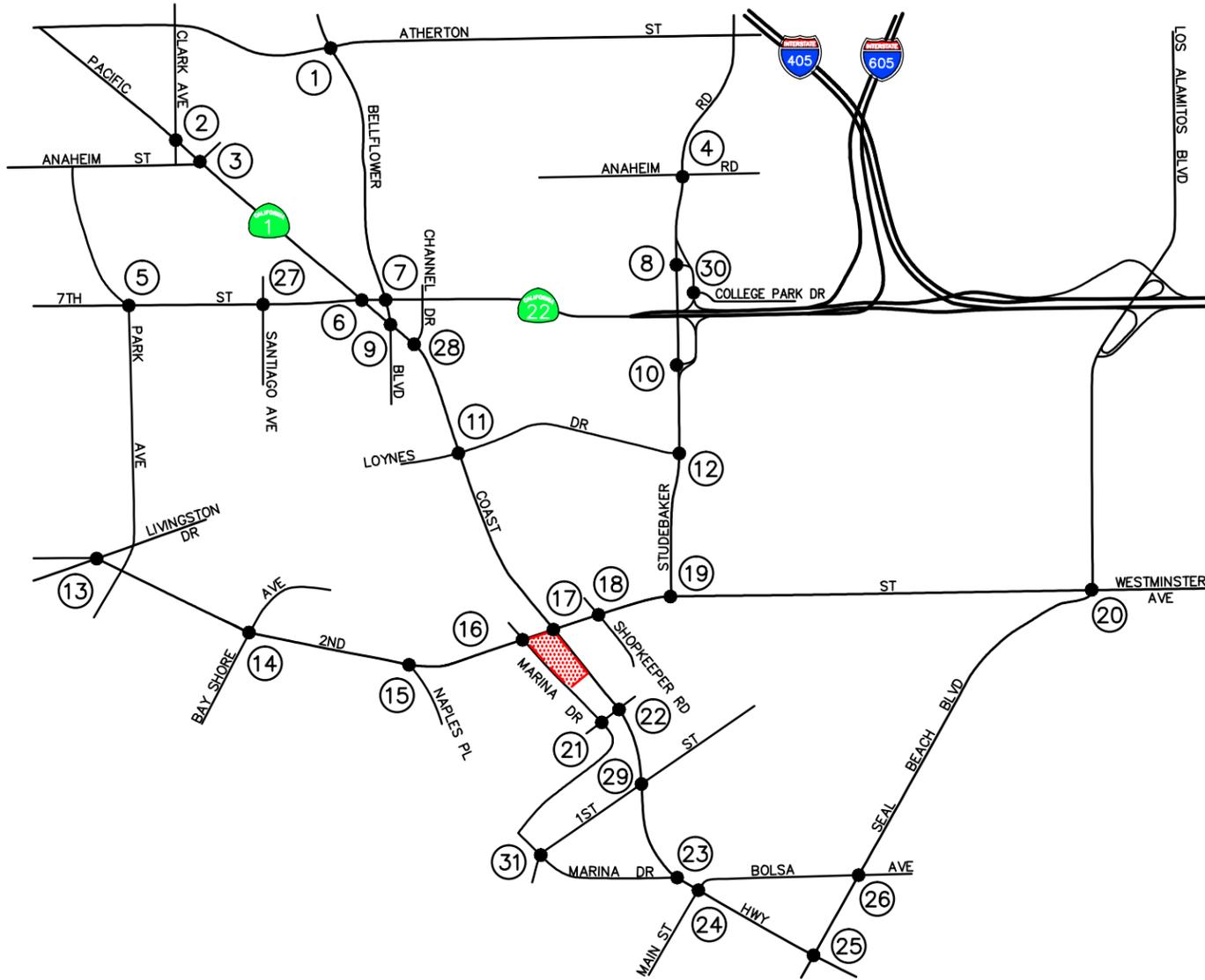
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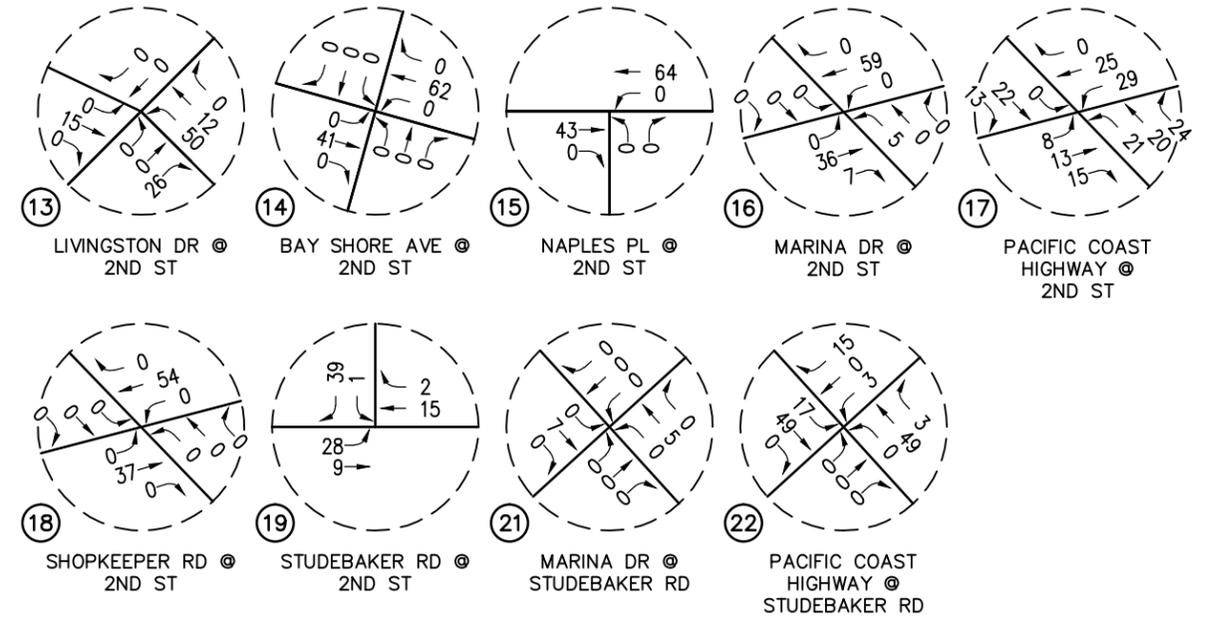
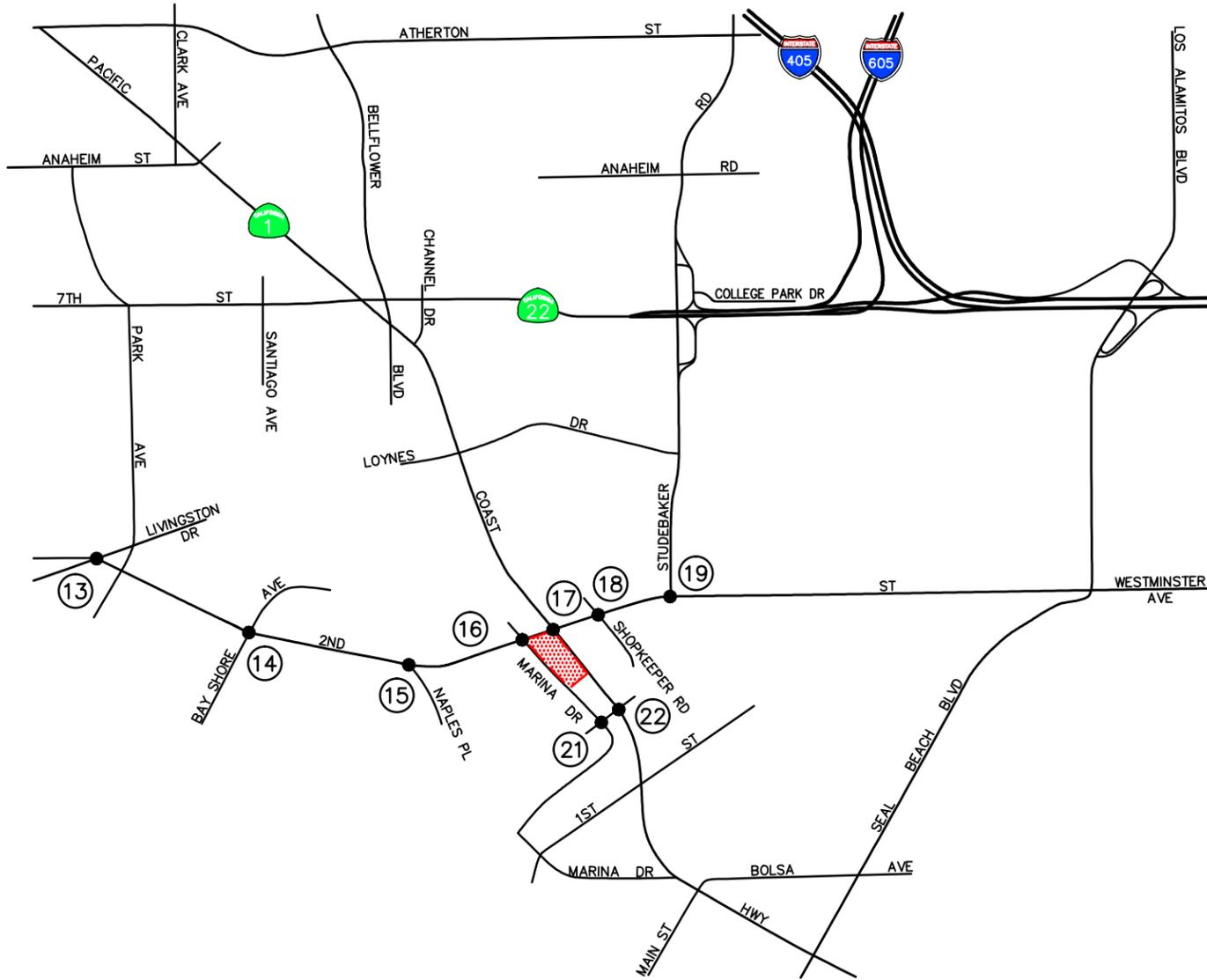
KEY
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 [Red Hatched Box] = PROJECT SITE

FIGURE 6-2
AM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

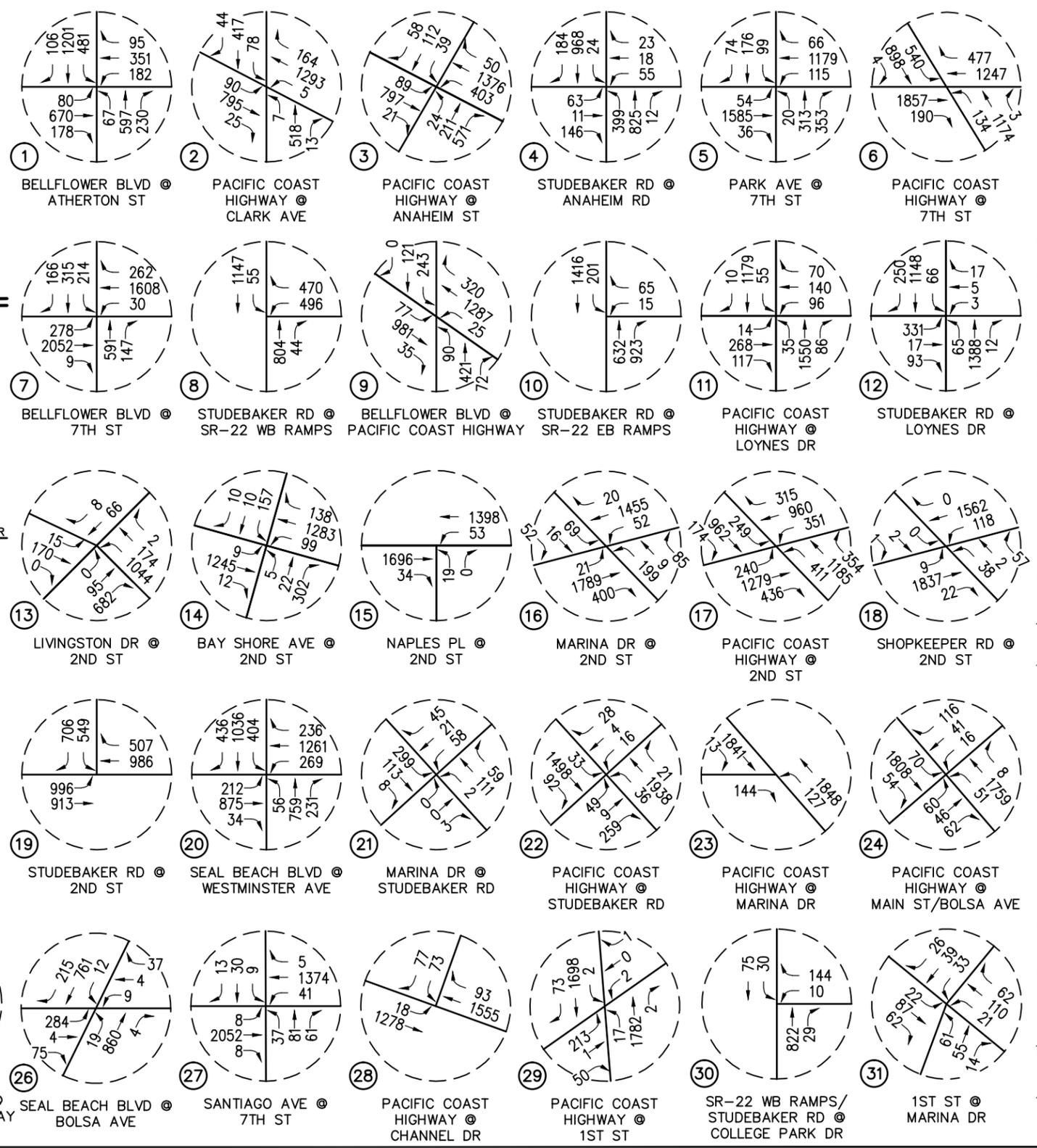
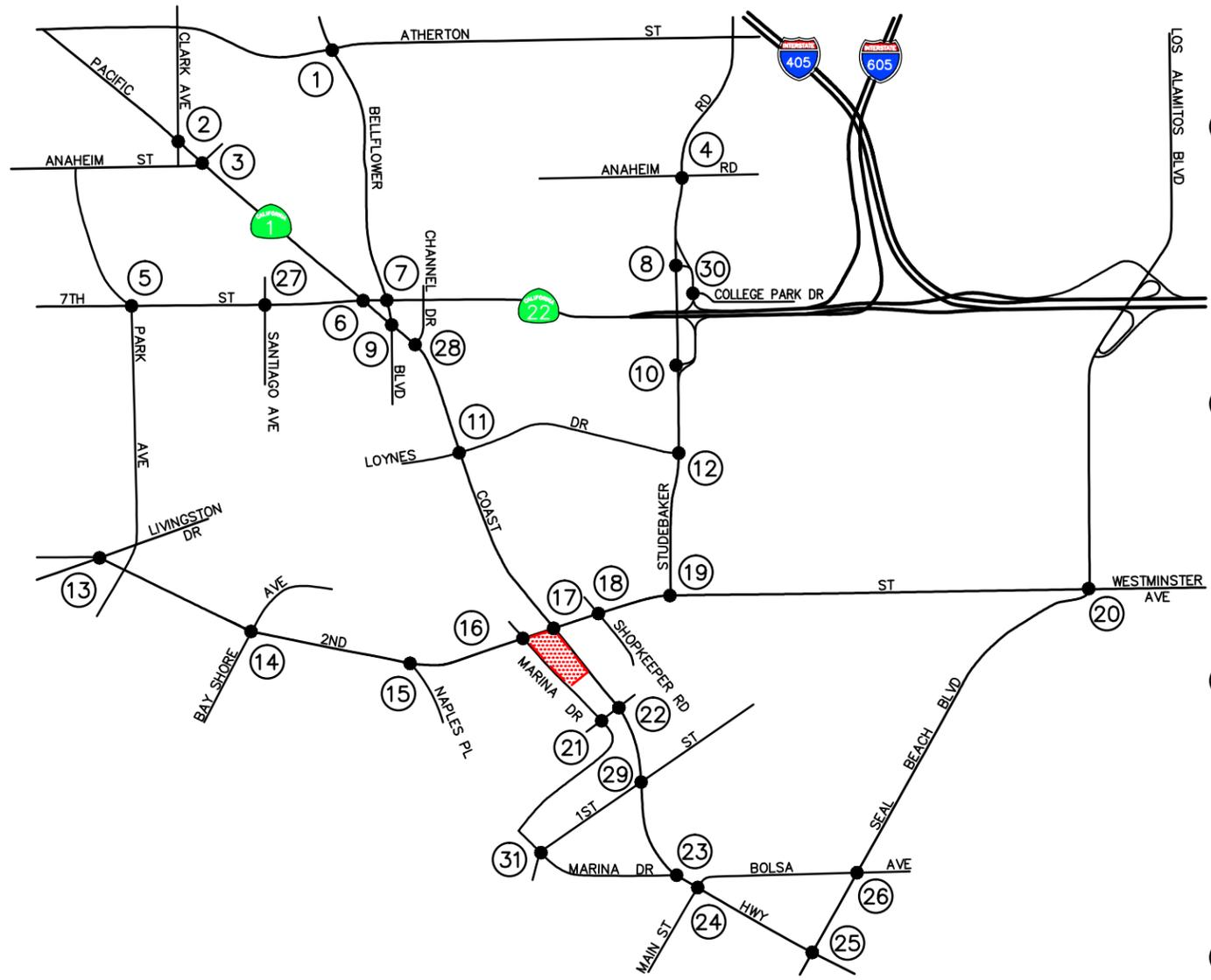
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KEY
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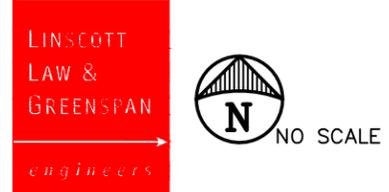
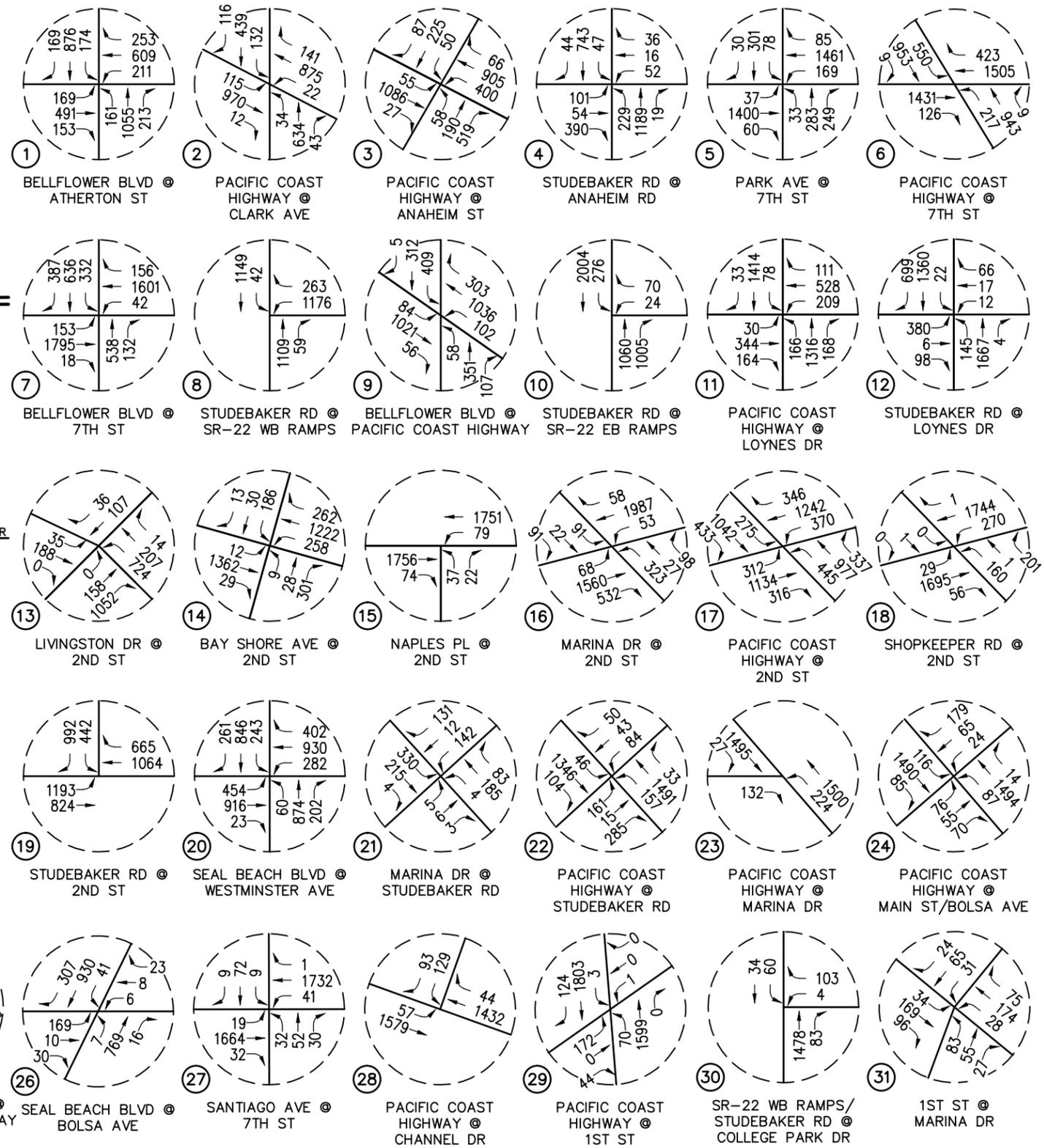
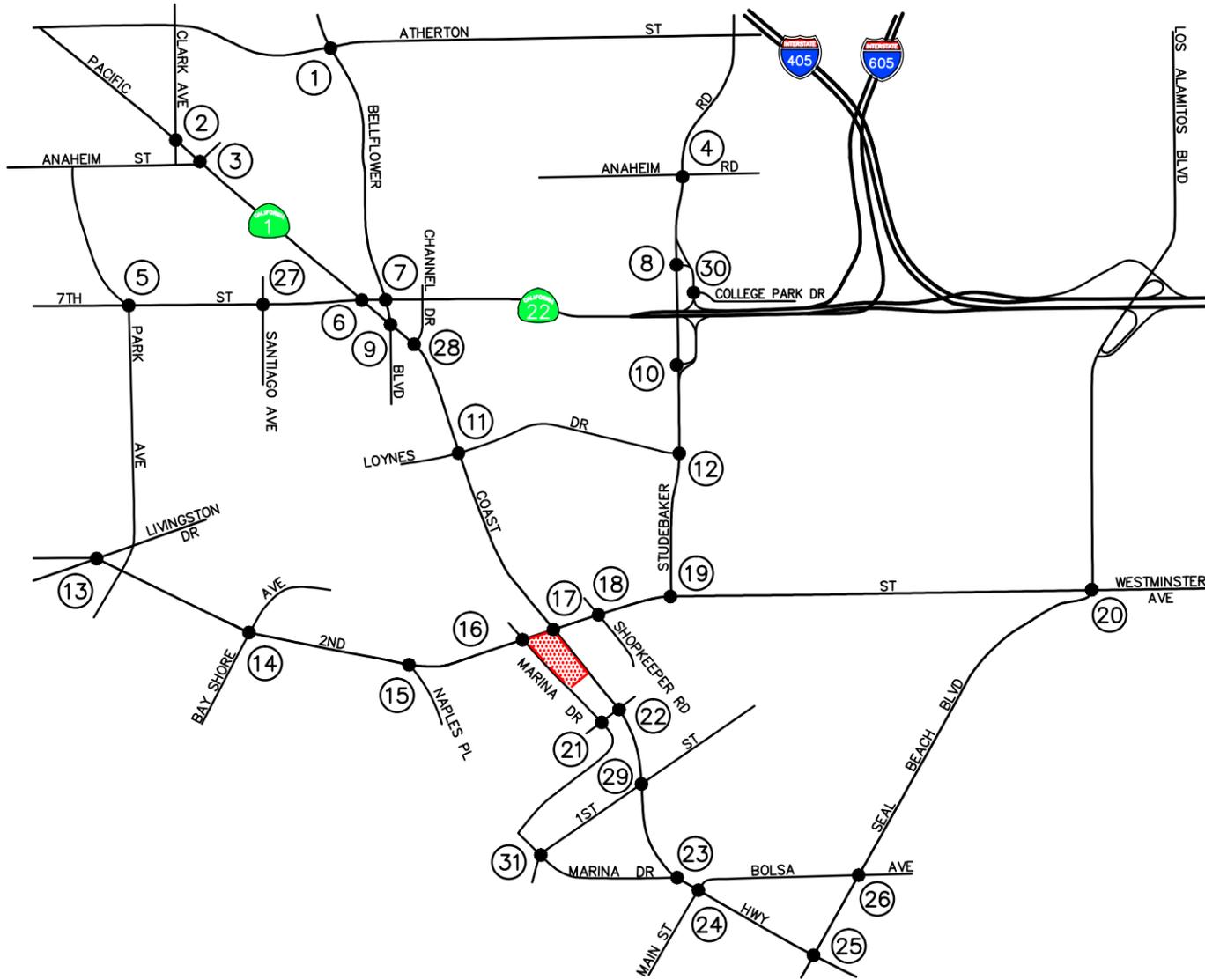


FIGURE 6-5
 YEAR 2019 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

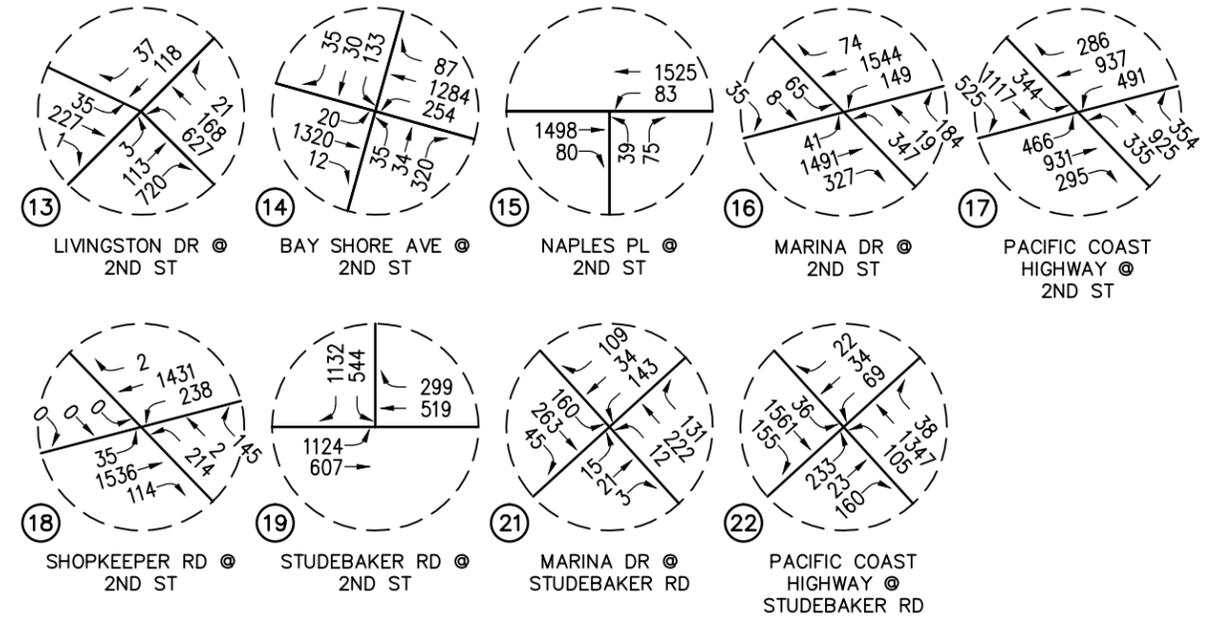
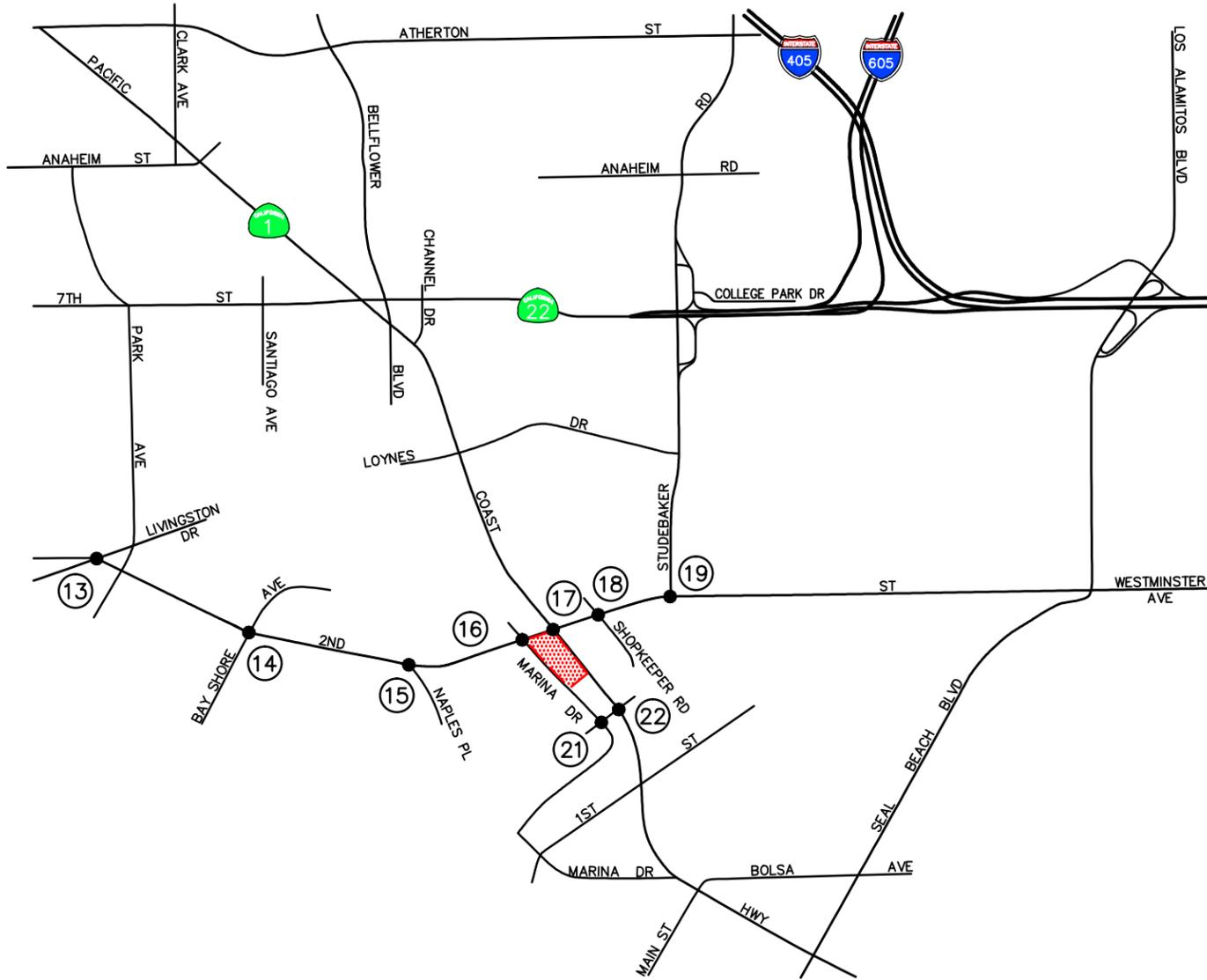
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KEY
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 [Red Hatched Box] = PROJECT SITE

FIGURE 6-6
 YEAR 2019 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH

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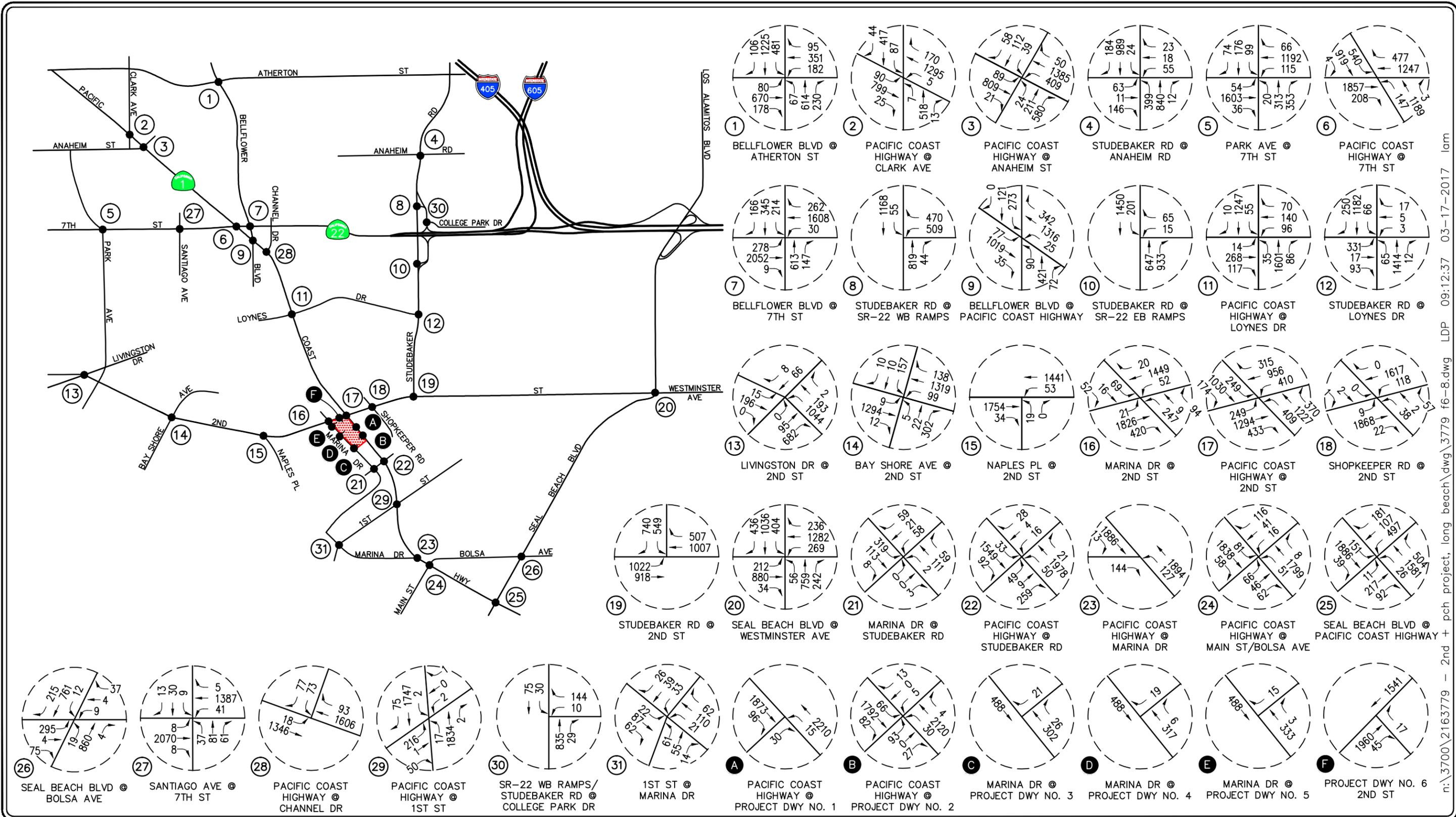


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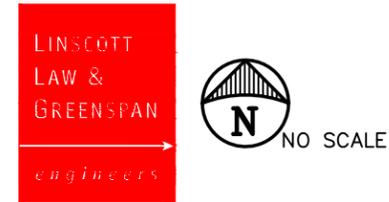
- = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 6-7

YEAR 2019 CUMULATIVE SATURDAY PEAK HOUR TRAFFIC VOLUMES
2ND + PCH PROJECT, LONG BEACH

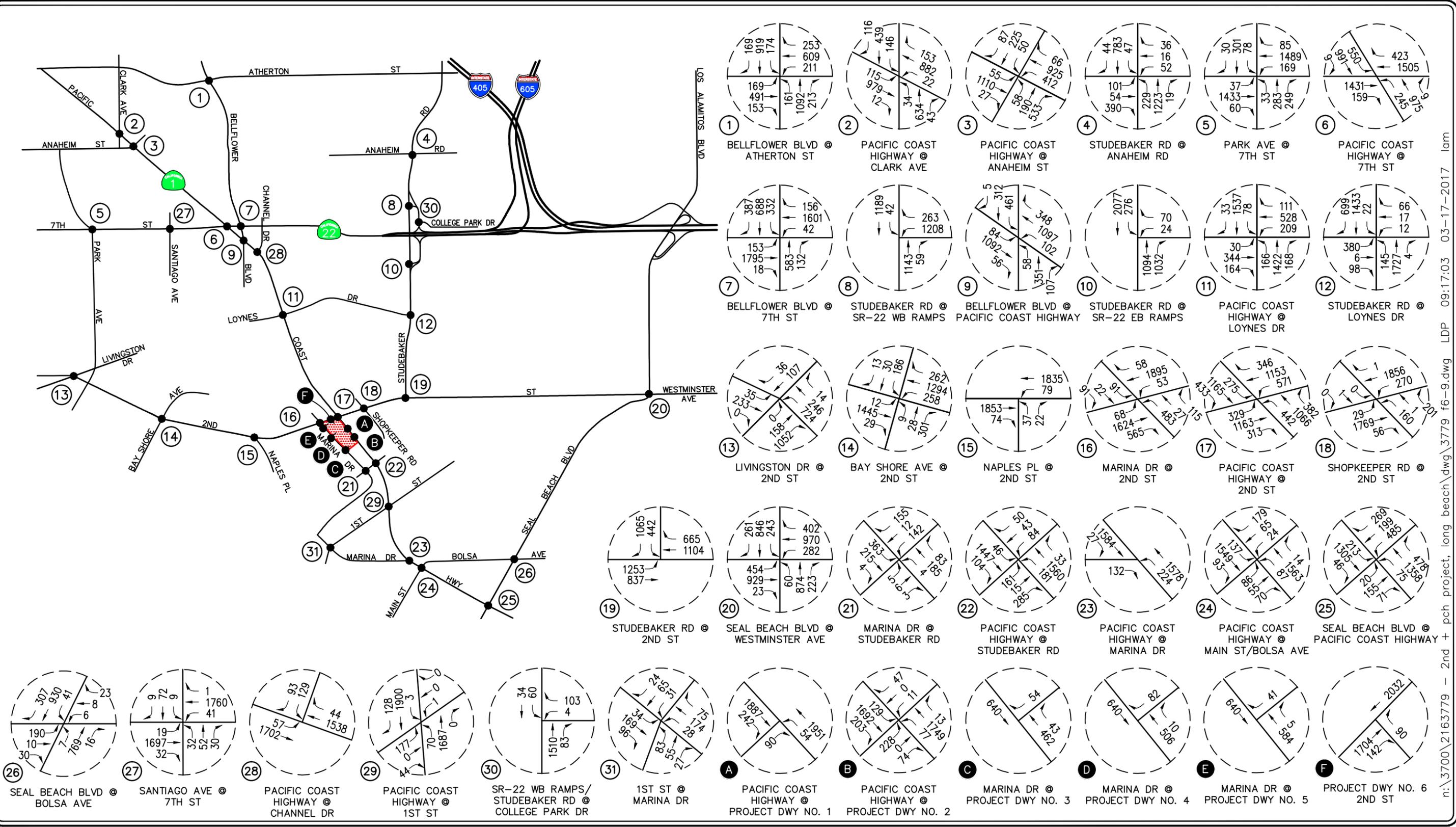


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KEY
 # = STUDY INTERSECTION
 [Red Hatched Box] = PROJECT SITE

FIGURE 6-8
 YEAR 2019 CUMULATIVE PLUS PROJECT
 AM PEAK HOUR TRAFFIC VOLUMES
 2ND + PCH PROJECT, LONG BEACH



KEY

= STUDY INTERSECTION

= PROJECT SITE

FIGURE 6-9

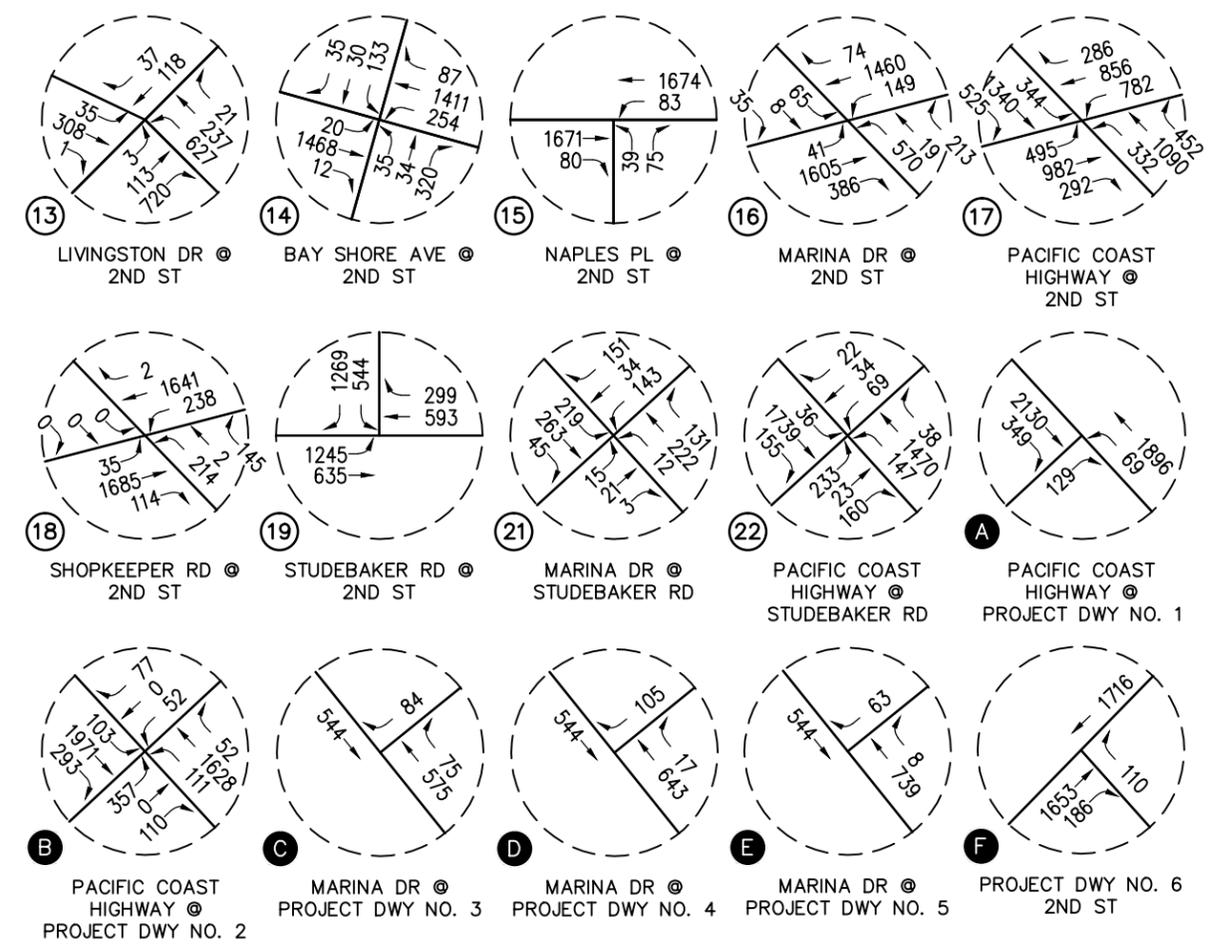
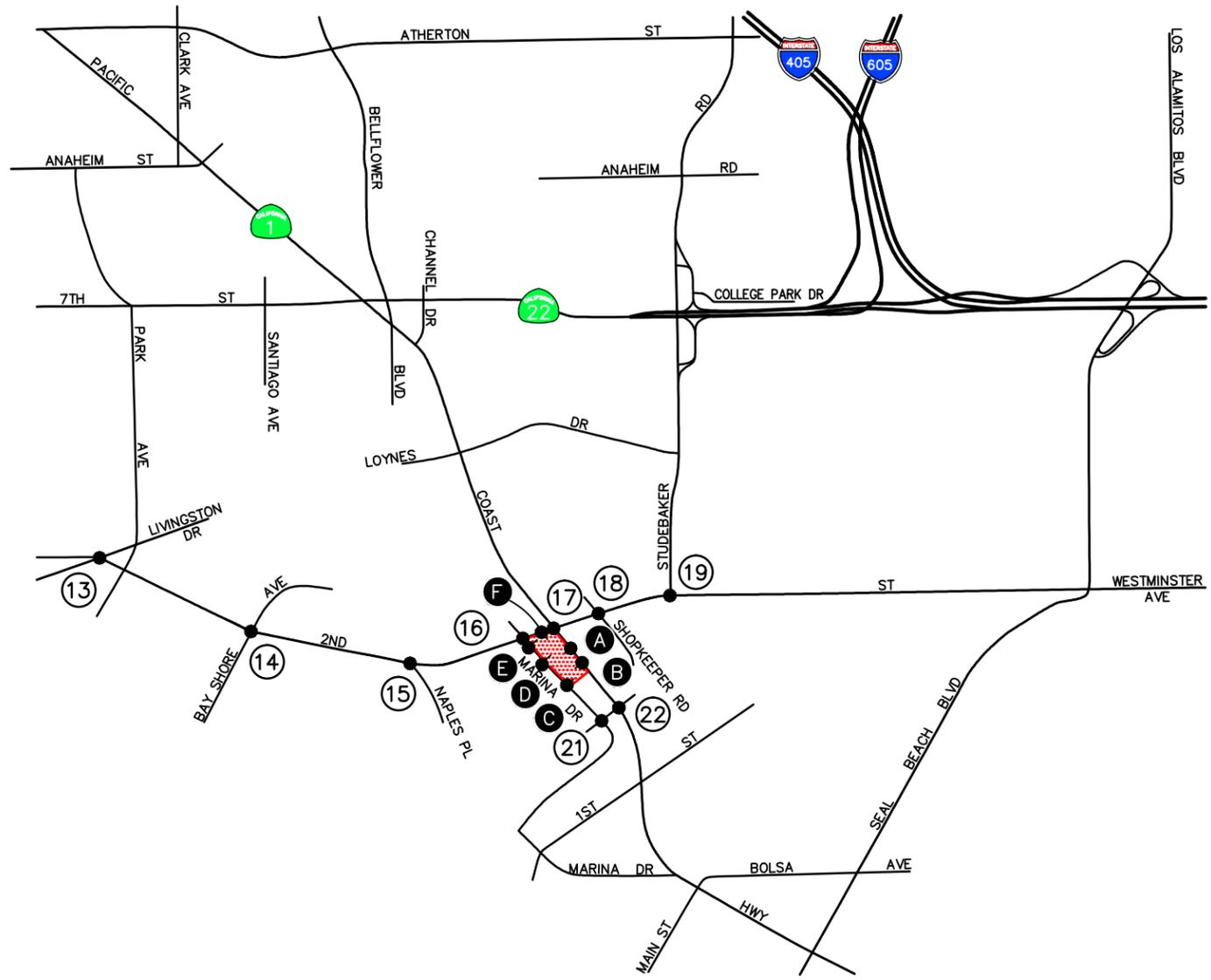
YEAR 2019 CUMULATIVE PLUS PROJECT

PM PEAK HOUR TRAFFIC VOLUMES

2ND + PCH PROJECT, LONG BEACH

NO SCALE

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7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

7.1 Impact Criteria and Thresholds

The relative impact of the added project traffic volumes generated by the proposed Project during the weekday and weekend day (Saturday) peak hours was evaluated based on analysis of future operating conditions at the thirty-one (31) 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.

7.1.1 *City of Long Beach*

Impacts to City of Long Beach intersections (i.e. all thirty-one key study intersections except 20, 23, 24, 25, 26, 29 and 31) are considered significant if:

- An unacceptable peak hour Level of Service (LOS) (i.e. LOS E or F) at any of the key intersections is projected. The City of Long Beach considers LOS D (ICU = 0.801 - 0.900) to be the minimum acceptable LOS for all intersections. For the City of Long Beach, the current LOS, if worse than LOS D (i.e. LOS E or F), should also be maintained; and
- The project increases traffic demand at the study intersection by 2% of capacity (ICU increase ≥ 0.020), causing or worsening LOS E or F (ICU > 0.901).
- At unsignalized intersections, an impact is considered to be significant if the project causes an intersection operating at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a traffic signal is justified.

7.1.2 *City of Seal Beach*

Impacts to City of Seal Beach intersections (i.e. key study intersections 20, 23, 24, 25, 26, 29 and 31) are considered significant if:

- An unacceptable peak hour Level of Service (LOS) (i.e. LOS E or F) at any of the key intersections is projected. The City of Seal Beach considers LOS D (ICU = 0.801 - 0.900) to be the minimum acceptable LOS for all intersections; and
- Per City of Seal Beach criteria, a significant transportation impact is determined based on a sliding scale that varies with LOS. At LOS A or B, the threshold of significance is an increase of 0.06 or greater in the ICU value. At LOS C or D, the threshold of significance is an increase of 0.04 or greater or 0.02 or greater, respectively, in the ICU value. This is reduced to 0.01 or greater under LOS E and F.
- At unsignalized intersections, this report identifies a significant traffic impact when the addition of Project traffic results in a decrease in LOS by one level or more for those locations operating at LOS D or E.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the twenty-six (26) key study intersections using the ICU/HCM methodologies:

- A. Existing Traffic Conditions;
- B. Existing Plus Project Traffic Conditions;
- C. Scenario (B) with Improvements, if necessary;
- D. Year 2019 Cumulative Traffic Conditions;
- E. Year 2019 Cumulative Plus Project Traffic Conditions; and
- F. Scenario (E) with Improvements, if necessary.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Existing Plus Project Traffic Conditions

Table 8-1 summarizes the peak hour Level of Service results at the thirty-one (31) 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 (which were also presented in *Table 3-5*). The second column (2) lists existing plus project traffic conditions, shows the increase in ICU value or Delay value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The third column (3) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

8.1.1 Existing Plus Project Traffic Conditions

Review of Column 2 of *Table 8-1* indicates that traffic associated with the proposed Project will significantly impact eight of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The eight intersections impacted by the proposed Project under existing plus project traffic conditions and the time period in which the impact occurs include:

<u>Key Intersection</u>	<u>Impacted Time Period</u>
8. Studebaker Road at SR-22 WB Ramps	PM
14. Bay Shore Avenue at 2 nd Street	PM
17. Pacific Coast Highway at 2 nd Street	AM / PM
19. Studebaker Road at 2 nd Street	PM
20. Seal Beach Boulevard at Westminster Avenue	PM
23. Pacific Coast Highway at Marina Drive	AM
24. Pacific Coast Highway at Main/Bolsa Avenue	PM
25. Seal Beach Boulevard at Pacific Coast Highway	PM

Please note that although the intersections of Park Avenue/7th Street, Pacific Coast Highway/7th Street, Bellflower Boulevard/7th Street and Studebaker Road/SR-22 EB Ramps are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours with the addition of project traffic, the proposed Project is expected to add less than 0.020 to the ICU value. The remaining nineteen (19) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to existing traffic.

As shown in column 3 of *Table 8-1*, the implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street, Studebaker Road/2nd Street and Seal Beach Boulevard/Westminster Avenue offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or F during the AM and/or PM peak hours. The implementation of improvements at the five remaining impacted key study intersections completely

offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours. Refer to Section 12.3 for details on the recommended improvements. *Appendix D* presents the existing plus project ICU/LOS and HCM/LOS calculations for the thirty-one (31) key study intersections.

8.2 Year 2019 Traffic Conditions

Table 8-2 summarizes the peak hour Level of Service results at the thirty-one (31) key study intersections for the Year 2019 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 (which were also presented in *Table 3-5*). The second column (2) lists future Year 2019 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic) based on existing intersection geometry, but 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, shows the increase in ICU value or Delay value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

8.2.1 Year 2019 Cumulative Traffic Conditions

An analysis of future (Year 2019) cumulative traffic conditions indicates that ambient traffic growth and cumulative projects traffic will cumulatively impact thirteen (13) of the thirty-one (31) key study intersections during the AM and/or PM peak hours. The remaining eighteen (18) key study intersections are forecast to continue to operate at an acceptable LOS based on the LOS criteria identified in this report. The locations projected to operate at an adverse LOS are as follows:

<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. Bellflower Blvd at Atherton Street	---	---	0.945	E
5. Park Avenue at 7 th Street	0.981	E	0.908	E
6. Pacific Coast Highway at 7 th Street	1.009	F	1.010	F
7. Bellflower Blvd at 7 th Street	1.002	F	0.925	E
8. Studebaker Rd at SR-22 WB Ramps	---	---	0.950	E
10. Studebaker Rd at SR-22 EB Ramps	---	---	0.995	E
14. Bay Shore Avenue at 2 nd Street	---	---	1.043	F
17. Pacific Coast Highway at 2 nd Street	0.977	E	0.916	E
18. Shopkeeper Road at 2 nd Street	---	---	0.910	E
19. Studebaker Road at 2 nd Street	---	---	0.980	E
20. Seal Beach Blvd at Westminster Ave	0.967	E	0.958	E
23. Pacific Coast Hwy at Marina Drive	38.5 s/v	E	---	---
25. Seal Beach Blvd at Pacific Coast Hwy	0.914	E	---	---

Please note that the level of service results for the intersections of Bellflower Boulevard/Atherton Street (key study intersection 1), Bellflower Boulevard/7th Street (key study intersection 7) and Bellflower Boulevard/Pacific Coast Highway (key study intersection 9) include improvements planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. Please note that the level of service results for the intersection of Studebaker Road/Loynes Drive (key study intersection 12) include improvements associated with the cumulative project located at the intersection (i.e. Cumulative Project #1; AES Battery Energy Storage System located at 690 Studebaker Road). The planned improvements are summarized in Section 12.2.

8.2.2 Year 2019 Cumulative Plus Project Traffic Conditions

Review of Column 3 of *Table 8-2* indicates that traffic associated with the proposed Project will significantly impact eleven of the thirty-one (31) key study intersections in the Year 2019, when compared to the LOS standards and significant impact criteria specified in this report. The eleven intersections impacted by the proposed Project under Year 2019 plus project traffic conditions and the time period in which the impact occurs include:

<u>Key Intersection</u>	<u>Impacted Time Period</u>
8. Studebaker Road at SR-22 WB Ramps	PM
12. Studebaker Road at Loynes Drive	PM
14. Bay Shore Avenue at 2 nd Street	PM
17. Pacific Coast Highway at 2 nd Street	AM / PM
19. Studebaker Road at 2 nd Street	AM / PM
20. Seal Beach Blvd at Westminster Avenue	PM
22. Pacific Coast Highway at Studebaker Road	PM
23. Pacific Coast Highway at Marina Drive	AM
24. Pacific Coast Highway at Main/Bolsa Avenue	PM
25. Seal Beach Blvd at Pacific Coast Highway	PM
29. Pacific Coast Highway at 1 st Street	PM

Please note that although the intersections of Bellflower Boulevard/Atherton Street, Park Avenue/7th Street, Pacific Coast Highway/7th Street, Bellflower Boulevard/7th Street, Studebaker Road/SR-22 EB Ramps and Shopkeeper Road/2nd Street are forecast to operate at unacceptable LOS E and/or LOS F during the AM and/or PM peak hours with the addition of project traffic, the proposed Project is expected to add less than 0.020 to the ICU value. The remaining fourteen (14) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2019.

As shown in column 4 of *Table 8-2*, the implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street, Pacific Coast Highway/2nd Street, Studebaker Road/2nd Street and Seal Beach Boulevard/Westminster Avenue offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or F during the AM

and/or PM peak hours. The implementation of improvements at the seven remaining impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours. Refer to Section 12.4 for details on the recommended improvements.

Appendix E presents the Year 2019 ICU/LOS and HCM/LOS calculations for the thirty-one (31) key study intersections.

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

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ¹⁹				(3) Existing Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
1. Bellflower Boulevard at Atherton Street	AM	0.795	C	0.803	D	0.008	No	--	--	--	--
	PM	0.851	D	0.860	D	0.009	No	--	--	--	--
2. Pacific Coast Highway at Clark Avenue	AM	0.854	D	0.862	D	0.008	No	--	--	--	--
	PM	0.818	D	0.833	D	0.015	No	--	--	--	--
3. Pacific Coast Highway at Anaheim Street	AM	0.763	C	0.772	C	0.009	No	--	--	--	--
	PM	0.845	D	0.860	D	0.015	No	--	--	--	--
4. Studebaker Road at Anaheim Road	AM	0.777	C	0.783	C	0.006	No	--	--	--	--
	PM	0.706	C	0.717	C	0.011	No	--	--	--	--
5. Park Avenue at 7th Street	AM	0.953	E	0.959	E	0.006	No	--	--	--	--
	PM	0.883	D	0.893	D	0.010	No	--	--	--	--
6. Pacific Coast Highway at 7th Street	AM	0.979	E	0.986	E	0.007	No	--	--	--	--
	PM	0.980	E	0.987	E	0.007	No	--	--	--	--
7. Bellflower Boulevard at 7th Street	AM	0.917	E	0.922	E	0.005	No	--	--	--	--
	PM	0.847	D	0.856	D	0.009	No	--	--	--	--
8. Studebaker Road at SR-22 Westbound Ramps	AM	0.639	B	0.650	B	0.011	No	0.542	A	-0.097	No
	PM	0.908	E	0.930	E	0.022	Yes	0.798	C	-0.110	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

¹⁹ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

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

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ²⁰				(3) Existing Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
9. Bellflower Boulevard at Pacific Coast Highway	AM	0.662	B	0.679	B	0.017	No	--	--	--	--
	PM	0.668	B	0.700	C	0.032	No	--	--	--	--
10. Studebaker Road at SR-22 Eastbound Ramps	AM	0.852	D	0.859	D	0.007	No	--	--	--	--
	PM	0.931	E	0.948	E	0.017	No	--	--	--	--
11. Pacific Coast Highway at Loynes Drive	AM	0.677	B	0.687	B	0.010	No	--	--	--	--
	PM	0.809	D	0.835	D	0.026	No	--	--	--	--
12. Studebaker Road at Loynes Drive	AM	0.675	B	0.683	B	0.008	No	--	--	--	--
	PM	0.791	C	0.794	C	0.003	No	--	--	--	--
13. Livingston Drive at 2nd Street	AM	0.624	B	0.638	B	0.014	No	--	--	--	--
	PM	0.583	A	0.609	B	0.026	No	--	--	--	--
14. Bay Shore Avenue at 2nd Street	AM	0.847	D	0.863	D	0.016	No	0.846	D	-0.001	No
	PM	1.009	F	1.035	F	0.026	Yes	1.013	F	0.004	No
15. Naples Plaza at 2nd Street	AM	0.699	B	0.717	C	0.018	No	--	--	--	--
	PM	0.746	C	0.776	C	0.030	No	--	--	--	--
16. Marina Drive at 2nd Street	AM	0.664	B	0.689	B	0.025	No	--	--	--	--
	PM	0.792	C	0.828	D	0.036	No	--	--	--	--

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²⁰ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

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

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ²¹				(3) Existing Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
17. Pacific Coast Highway at 2nd Street	AM	0.933	E	0.968	E	0.035	Yes	0.803	D	-0.130	No
	PM	0.876	D	0.977	E	0.101	Yes	0.897	D	0.021	No
18. Shopkeeper Road at 2nd Street	AM	0.648	B	0.654	B	0.006	No	--	--	--	--
	PM	0.881	D	0.897	D	0.016	No	--	--	--	--
19. Studebaker Road at 2nd Street	AM	0.857	D	0.870	D	0.013	No	0.759	C	-0.098	No
	PM	0.947	E	0.968	E	0.021	Yes	0.830	D	-0.117	No
20. Seal Beach Boulevard at Westminster Avenue	AM	0.936	E	0.945	E	0.009	No	0.904	E	-0.032	No
	PM	0.929	E	0.946	E	0.017	Yes	0.892	D	-0.037	No
21. Marina Drive at Studebaker Road	AM	11.9 s/v	B	10.0 s/v	A ²²	0.0 s/v	No	--	--	--	--
	PM	15.8 s/v	C	12.7 s/v	B	0.0 s/v	No	--	--	--	--
22. Pacific Coast Highway at Studebaker Rd	AM	0.797	C	0.813	D	0.016	No	--	--	--	--
	PM	0.840	D	0.872	D	0.032	No	--	--	--	--
23. Pacific Coast Highway at Marina Drive	AM	36.5 s/v	E	39.1 s/v	E	2.6 s/v	Yes	0.836	D	--	No
	PM	19.9 s/v	C	21.5 s/v	C	1.6 s/v	No	0.800	D	--	No
24. Pacific Coast Highway at Main/Bolsa Avenue	AM	0.730	C	0.753	C	0.023	No	0.709	C	-0.021	No
	PM	0.702	C	0.743	C	0.041	Yes	0.672	B	-0.030	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²¹ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

²² The LOS calculations for this intersection include the following improvements that will be constructed as part of the proposed Project:

- Provide an exclusive northbound right-turn lane and a second southbound left-turn lane.

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

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ²³				(3) Existing Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
25. Seal Beach Boulevard at Pacific Coast Highway	AM	0.885	D	0.894	D	0.009	No	0.862	D	-0.023	No
	PM	0.811	D	0.831	D	0.020	Yes	0.807	D	-0.004	No
26. Seal Beach Boulevard at Bolsa Avenue	AM	0.548	A	0.555	A	0.007	No	--	--	--	--
	PM	0.492	A	0.505	A	0.013	No	--	--	--	--
27. Santiago Avenue at 7th Street	AM	0.674	B	0.678	B	0.004	No	--	--	--	--
	PM	0.729	C	0.737	C	0.008	No	--	--	--	--
28. Pacific Coast Highway at Channel Drive	AM	0.518	A	0.528	A	0.010	No	--	--	--	--
	PM	0.524	A	0.546	A	0.022	No	--	--	--	--
29. Pacific Coast Highway at 1st Street	AM	0.699	B	0.716	C	0.017	No	--	--	--	--
	PM	0.758	C	0.791	C	0.033	No	--	--	--	--
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	AM	15.2 s/v	C	15.4 s/v	C	0.2 s/v	No	--	--	--	--
	PM	26.7 s/v	D	27.6 s/v	D	0.9 s/v	No	--	--	--	--
31. 1st Street at Marina Drive	AM	9.2 s/v	A	9.2 s/v	A	0.0 s/v	No	--	--	--	--
	PM	11.3 s/v	B	11.3 s/v	B	0.0 s/v	No	--	--	--	--

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²³ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

TABLE 8-2
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2019 Cumulative Traffic Conditions		(3) Year 2019 Cumulative Plus Project Traffic Conditions ²⁴				(4) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
1. Bellflower Boulevard at Atherton Street	AM	0.795	C	0.857	D ²⁵	0.862	D ²⁵	0.005	No	--	--	--	--
	PM	0.851	D	0.945	E	0.957	E	0.012	No	--	--	--	--
2. Pacific Coast Highway at Clark Avenue	AM	0.854	D	0.878	D	0.887	D	0.009	No	--	--	--	--
	PM	0.818	D	0.844	D	0.859	D	0.015	No	--	--	--	--
3. Pacific Coast Highway at Anaheim Street	AM	0.763	C	0.787	C	0.796	C	0.009	No	--	--	--	--
	PM	0.845	D	0.870	D	0.885	D	0.015	No	--	--	--	--
4. Studebaker Road at Anaheim Road	AM	0.777	C	0.801	D	0.808	D	0.007	No	--	--	--	--
	PM	0.706	C	0.728	C	0.739	C	0.011	No	--	--	--	--
5. Park Avenue at 7th Street	AM	0.953	E	0.981	E	0.987	E	0.006	No	--	--	--	--
	PM	0.883	D	0.908	E	0.918	E	0.010	No	--	--	--	--
6. Pacific Coast Highway at 7th Street	AM	0.979	E	1.009	F	1.016	F	0.007	No	--	--	--	--
	PM	0.980	E	1.010	F	1.016	F	0.006	No	--	--	--	--
7. Bellflower Boulevard at 7th Street	AM	0.917	E	1.002	F²⁵	1.009	F²⁵	0.007	No	--	--	--	--
	PM	0.847	D	0.925	E	0.939	E	0.014	No	--	--	--	--
8. Studebaker Road at SR-22 Westbound Ramps	AM	0.639	B	0.681	B	0.692	B	0.011	No	0.572	A	-0.109	No
	PM	0.908	E	0.950	E	0.971	E	0.021	Yes	0.832	D	-0.118	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²⁴ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

²⁵ The LOS calculations for this intersection include improvements planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. Refer to Section 12.2 (planned improvements).

TABLE 8-2 (CONTINUED)
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2019 Cumulative Traffic Conditions		(3) Year 2019 Cumulative Plus Project Traffic Conditions ²⁶				(4) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
9. Bellflower Boulevard at Pacific Coast Highway	AM	0.662	B	0.682	B ²⁷	0.699	B ²⁷	0.017	No	--	--	--	--
	PM	0.668	B	0.698	B	0.724	C	0.026	No	--	--	--	--
10. Studebaker Road at SR-22 Eastbound Ramps	AM	0.852	D	0.894	D	0.900	D	0.006	No	--	--	--	--
	PM	0.931	E	0.995	E	1.012	F	0.017	No	--	--	--	--
11. Pacific Coast Highway at Loynes Drive	AM	0.677	B	0.706	C	0.716	C	0.010	No	--	--	--	--
	PM	0.809	D	0.838	D	0.863	D	0.025	No	--	--	--	--
12. Studebaker Road at Loynes Drive	AM	0.675	B	0.781	C ²⁸	0.789	C ²⁸	0.008	No	0.713	C	-0.068	No
	PM	0.791	C	0.880	D	0.907	E	0.027	Yes	0.891	D	0.011	No
13. Livingston Drive at 2nd Street	AM	0.624	B	0.648	B	0.662	B	0.014	No	--	--	--	--
	PM	0.583	A	0.609	B	0.636	B	0.027	No	--	--	--	--
14. Bay Shore Avenue at 2nd Street	AM	0.847	D	0.878	D	0.894	D	0.016	No	0.877	D	-0.001	No
	PM	1.009	F	1.043	F	1.069	F	0.026	Yes	1.046	F	0.003	No
15. Naples Plaza at 2nd Street	AM	0.699	B	0.725	C	0.743	C	0.018	No	--	--	--	--
	PM	0.746	C	0.771	C	0.802	D	0.031	No	--	--	--	--
16. Marina Drive at 2nd Street	AM	0.664	B	0.687	B	0.711	C	0.024	No	--	--	--	--
	PM	0.792	C	0.818	D	0.854	D	0.036	No	--	--	--	--

Notes: **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²⁶ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

²⁷ The LOS calculations for this intersection include improvements planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. Refer to Section 12.2 (planned improvements).

²⁸ The LOS calculations for this intersection include improvements assumed as part of the AES Battery Energy Storage System cumulative project. Refer to Section 12.2 (planned improvements).

TABLE 8-2 (CONTINUED)
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2019 Cumulative Traffic Conditions		(3) Year 2019 Cumulative Plus Project Traffic Conditions ²⁹				(4) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
17. Pacific Coast Highway at 2nd Street	AM	0.933	E	0.977	E	1.011	F	0.034	Yes	0.822	D	-0.155	No
	PM	0.876	D	0.916	E	1.018	F	0.102	Yes	0.931	E	0.015	No
18. Shopkeeper Road at 2nd Street	AM	0.648	B	0.672	B	0.678	B	0.006	No	--	--	--	--
	PM	0.881	D	0.910	E	0.925	E	0.015	No	--	--	--	--
19. Studebaker Road at 2nd Street	AM	0.857	D	0.892	D	0.905	E	0.013	Yes	0.787	C	-0.105	No
	PM	0.947	E	0.980	E	1.001	F	0.021	Yes	0.856	D	-0.124	No
20. Seal Beach Boulevard at Westminster Avenue	AM	0.936	E	0.967	E	0.975	E	0.008	No	0.932	E	-0.035	No
	PM	0.929	E	0.958	E	0.975	E	0.017	Yes	0.918	E	-0.040	No
21. Marina Drive at Studebaker Road	AM	11.9 s/v	B	11.9 s/v	B	10.0 s/v	A ³⁰	0.0 s/v	No	--	--	--	--
	PM	15.8 s/v	C	16.9 s/v	C	13.2 s/v	B	0.0 s/v	No	--	--	--	--
22. Pacific Coast Highway at Studebaker Rd	AM	0.797	C	0.840	D	0.856	D	0.016	No	0.773	C	-0.067	No
	PM	0.840	D	0.889	D	0.921	E	0.032	Yes	0.792	C	-0.097	No
23. Pacific Coast Highway at Marina Drive	AM	36.5 s/v	E	38.5 s/v	E	41.3 s/v	E	2.8 s/v	Yes	0.869	D	--	No
	PM	19.9 s/v	C	23.2 s/v	C	25.5 s/v	D	2.3 s/v	No	0.834	D	--	No
24. Pacific Coast Highway at Main/Bolsa Avenue	AM	0.730	C	0.758	C	0.781	C	0.023	No	0.738	C	-0.020	No
	PM	0.702	C	0.729	C	0.770	C	0.041	Yes	0.702	C	-0.027	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

²⁹ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

³⁰ The LOS calculations for this intersection include the following improvements that will be constructed as part of the proposed Project:

- Provide an exclusive northbound right-turn lane and a second southbound left-turn lane.

TABLE 8-2 (CONTINUED)
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2019 Cumulative Traffic Conditions		(3) Year 2019 Cumulative Plus Project Traffic Conditions ³¹				(4) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
25. Seal Beach Boulevard at Pacific Coast Highway	AM	0.885	D	0.914	E	0.923	E	0.009	No	0.890	D	-0.024	No
	PM	0.811	D	0.841	D	0.861	D	0.020	Yes	0.836	D	-0.005	No
26. Seal Beach Boulevard at Bolsa Avenue	AM	0.548	A	0.564	A	0.571	A	0.007	No	--	--	--	--
	PM	0.492	A	0.506	A	0.519	A	0.013	No	--	--	--	--
27. Santiago Avenue at 7th Street	AM	0.674	B	0.692	B	0.696	B	0.004	No	--	--	--	--
	PM	0.729	C	0.750	C	0.758	C	0.008	No	--	--	--	--
28. Pacific Coast Highway at Channel Drive	AM	0.518	A	0.533	A	0.544	A	0.011	No	--	--	--	--
	PM	0.524	A	0.542	A	0.564	A	0.022	No	--	--	--	--
29. Pacific Coast Highway at 1st Street	AM	0.699	B	0.732	C	0.749	C	0.017	No	0.744	C	0.012	No
	PM	0.758	C	0.800	D	0.833	D	0.033	Yes	0.759	C	-0.041	No
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	AM	15.2 s/v	C	15.2 s/v	C	15.4 s/v	C	0.2 s/v	No	--	--	--	--
	PM	26.7 s/v	D	30.7 s/v	D	31.8 s/v	D	1.1 s/v	No	--	--	--	--
31. 1st Street at Marina Drive	AM	9.2 s/v	A	9.4 s/v	A	9.4 s/v	A	0.0 s/v	No	--	--	--	--
	PM	11.3 s/v	B	11.7 s/v	B	11.7 s/v	B	0.0 s/v	No	--	--	--	--

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards
- N.F. = none feasible. Intersection improvements at this key intersection are not feasible due to physical and right-of-way constraints

³¹ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

9.0 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

In collaboration with City of Long Beach staff, nine (9) of the thirty-one (31) key study intersections located in close proximity to the Project site have been selected for evaluation during weekend (Saturday) mid-day peak hour conditions. The nine (9) study intersections consist of the following:

13. Livingston Drive at 2nd Street
14. Bay Shore Avenue at 2nd Street
15. Naples Plaza at 2nd Street
16. Marina Drive at 2nd Street
17. Pacific Coast Highway at 2nd Street
18. Shopkeeper Road at 2nd Street
19. Studebaker Road at 2nd Street
21. Marina Drive at Studebaker Road
22. Pacific Coast Highway at Studebaker Road

An existing plus project Saturday analysis and a Year 2019 Saturday analysis was prepared for the aforementioned nine (9) key study intersections. The following sections summarize the results of the Saturday analyses.

9.1 Existing Plus Project Saturday Traffic Conditions

Table 9-1 summarizes the peak hour Level of Service results at the nine (9) key study intersections for existing plus project Saturday traffic conditions. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 9-1* presents a summary of existing Saturday Midday peak hour traffic conditions. The second column (2) lists existing plus project Saturday traffic conditions, shows the increase in ICU value or Delay value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The third column (3) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

9.1.1 Existing Saturday Traffic Conditions

Review of Column 1 of *Table 9-1* indicates that one (1) of the nine (9) key study intersections currently operates at an unacceptable LOS during the Saturday Midday peak hour. The intersection of Bay Shore Avenue/2nd Street currently operates at unacceptable LOS E during the Saturday Midday peak hour. The remaining eight key study intersections currently operate at acceptable LOS D or better during the Saturday Midday peak hour.

9.1.2 Existing Plus Project Saturday Traffic Conditions

Review of Column 2 of *Table 9-1* indicates that traffic associated with the proposed Project will significantly impact three of the nine (9) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining six (6) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project

generated traffic to existing Saturday traffic. The three intersections impacted by the proposed Project under existing plus project Saturday traffic conditions consist of the following:

<u>Key Intersection</u>	<u>Midday Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>
14. Bay Shore Avenue at 2 nd Street	1.029	F
17. Pacific Coast Highway at 2 nd Street	1.054	F
22. Pacific Coast Highway at Studebaker Road	0.927	E

As shown in column 3 of *Table 9-1*, the implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street offsets the impact of project traffic; however this location is still forecast to operate at unacceptable LOS E during the Saturday Midday peak hour. The implementation of improvements at the two remaining impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the Saturday Midday peak hour. Refer to Section 12.3 for details on the recommended improvements.

9.2 Year 2019 Traffic Conditions

Table 9-2 summarizes the peak hour Level of Service results at the nine (9) key study intersections for Year 2019 Saturday traffic conditions. The first column (1) of ICU/LOS and HCM/LOS values in *Table 9-2* presents a summary of existing Saturday Midday peak hour traffic conditions. The second column (2) lists future Year 2019 cumulative Saturday traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated by the proposed Project. The third column (3) presents future forecast Saturday traffic conditions with the addition of traffic generated by the proposed Project, shows the increase in ICU value or Delay value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

9.2.1 Year 2019 Cumulative Saturday Traffic Conditions

An analysis of future (Year 2019) cumulative Saturday traffic conditions indicates that ambient traffic growth and cumulative projects traffic will cumulatively impact two (2) of the nine (9) key study intersections during the Saturday Midday peak hour. The remaining seven (7) key study intersections are forecast to continue to operate at an acceptable LOS based on the LOS criteria identified in this report. The locations projected to operate at an adverse LOS on a Saturday in the Year 2019 are as follows:

<u>Key Intersection</u>	<u>Sat. Midday Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>
14. Bay Shore Avenue at 2 nd Street	1.021	F
17. Pacific Coast Highway at 2 nd Street	0.930	E

9.2.2 Year 2019 Cumulative Plus Project Saturday Traffic Conditions

Review of Column 3 of *Table 9-2* indicates that traffic associated with the proposed Project will significantly impact three of the nine (9) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining six (6) key study intersections are forecast to continue to operate at an acceptable LOS on a Saturday with the addition of project generated traffic in the Year 2019. The three intersections impacted by the proposed Project under Year 2019 plus project Saturday traffic conditions consist of the following:

<u>Key Intersection</u>	<u>Midday Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>
14. Bay Shore Avenue at 2 nd Street	1.067	F
17. Pacific Coast Highway at 2 nd Street	1.097	F
22. Pacific Coast Highway at Studebaker Road	0.973	E

It should be noted that the aforementioned three key study intersections that are impacted by the proposed Project under Year 2019 plus project Saturday traffic conditions are also impacted under Year 2019 plus project weekday AM and/or PM peak hour traffic conditions.

As shown in column 4 of *Table 9-2*, the implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street and Pacific Coast Highway/2nd Street offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or LOS F during the Saturday Midday peak hour. The implementation of improvements at the remaining impacted key study intersection completely offsets the impact of project traffic and the key study intersection is forecast to operate at an acceptable LOS during the Saturday Midday peak hour. Refer to Section 12.4 for details on the recommended improvements.

Appendix F presents the ICU/LOS and HCM/LOS Saturday calculations for the nine (9) key study intersections.

TABLE 9-1
EXISTING PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ³²				(3) Existing Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif-icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif-icant Impact
13. Livingston Drive at 2nd Street	Sat. Midday	0.544	A	0.591	A	0.047	No	--	--	--	--
14. Bay Shore Avenue at 2nd Street	Sat. Midday	0.983	E	1.029	F	0.046	Yes	0.987	E	0.004	No
15. Naples Plaza at 2nd Street	Sat. Midday	0.688	B	0.742	C	0.054	No	--	--	--	--
16. Marina Drive at 2nd Street	Sat. Midday	0.702	C	0.804	D	0.102	No	--	--	--	--
17. Pacific Coast Highway at 2nd Street	Sat. Midday	0.887	D	1.054	F	0.167	Yes	0.889	D	0.002	No
18. Shopkeeper Road at 2nd Street	Sat. Midday	0.843	D	0.874	D	0.031	No	--	--	--	--
19. Studebaker Road at 2nd Street	Sat. Midday	0.804	D	0.862	D	0.058	No	--	--	--	--
21. Marina Drive at Studebaker Road	Sat. Midday	16.4 s/v	C	14.0 s/v	B ³³	0.0 s/v	No	--	--	--	--
22. Pacific Coast Highway at Studebaker Rd	Sat. Midday	0.845	D	0.927	E	0.082	Yes	0.787	C	-0.058	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

³² Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

³³ The LOS calculations for this intersection include the following improvements that will be constructed as part of the proposed Project:

- Provide an exclusive northbound right-turn lane and a second southbound left-turn lane.

TABLE 9-2
YEAR 2019 CUMULATIVE PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2019 Cumulative Traffic Conditions		(3) Year 2019 Cumulative Plus Project Traffic Conditions ³⁴				(4) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
13. Livingston Drive at 2nd Street	Sat. Midday	0.544	A	0.579	A	0.626	B	0.047	No	--	--	--	--
14. Bay Shore Avenue at 2nd Street	Sat. Midday	0.983	E	1.021	F	1.067	F	0.046	Yes	1.024	F	0.003	No
15. Naples Plaza at 2nd Street	Sat. Midday	0.688	B	0.717	C	0.771	C	0.054	No	--	--	--	--
16. Marina Drive at 2nd Street	Sat. Midday	0.702	C	0.727	C	0.828	D	0.101	No	--	--	--	--
17. Pacific Coast Highway at 2nd Street	Sat. Midday	0.887	D	0.930	E	1.097	F	0.167	Yes	0.925	E	-0.005	No
18. Shopkeeper Road at 2nd Street	Sat. Midday	0.843	D	0.868	D	0.899	D	0.031	No	--	--	--	--
19. Studebaker Road at 2nd Street	Sat. Midday	0.804	D	0.837	D	0.895	D	0.058	No	--	--	--	--
21. Marina Drive at Studebaker Road	Sat. Midday	16.4 s/v	C	18.5 s/v	C	15.1 s/v	C ³⁵	0.0 s/v	No	--	--	--	--
22. Pacific Coast Highway at Studebaker Rd	Sat. Midday	0.845	D	0.892	D	0.973	E	0.081	Yes	0.825	D	-0.067	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

³⁴ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

³⁵ The LOS calculations for this intersection include the following improvements that will be constructed as part of the proposed Project:

- Provide an exclusive northbound right-turn lane and a second southbound left-turn lane.

10.0 STATE OF CALIFORNIA (CALTRANS) METHODOLOGY

In conformance with the current Caltrans *Guide for the Preparation of Traffic Impact Studies*, existing and projected peak hour operating conditions at the sixteen (16) 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 sixteen of thirty-one study intersections:

- | | |
|--|---|
| 2. Pacific Coast Highway at Clark Avenue | 17. Pacific Coast Highway at 2 nd Street |
| 3. Pacific Coast Highway at Anaheim Street | 22. Pacific Coast Highway at Studebaker Road |
| 6. Pacific Coast Highway at 7 th Street | 23. Pacific Coast Highway at Marina Drive |
| 7. Bellflower Boulevard at 7 th Street | 24. Pacific Coast Highway at Main Street/Bolsa Avenue |
| 8. Studebaker Road at SR-22 WB Ramps | 25. Seal Beach Boulevard at Pacific Coast Highway |
| 9. Bellflower Boulevard at Pacific Coast Highway | 28. Pacific Coast Highway at Channel Drive |
| 10. Studebaker Road at SR-22 EB Ramps | 29. Pacific Coast Highway at 1 st Street |
| 11. Pacific Coast Highway at Loynes Drive | 30. SR-22 WB Ramps/Studebaker Rd at College Park Dr |

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.

10.1 Existing Plus Project Traffic Conditions

Table 10-1 summarizes the existing plus project peak hour HCM level of service results at the sixteen state-controlled study intersections within the study area. The first column (1) of HCM/LOS values in **Table 10-1** presents a summary of existing traffic conditions. The second column (2) presents existing plus project traffic conditions and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The third column (3) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

10.1.1 Existing Traffic Conditions

Review of column one (1) of **Table 10-1** indicates that all of the state-controlled study intersections currently operate at an acceptable LOS D or better during the AM and PM peak hours except for the intersection of Pacific Coast Highway/Marina Drive. The intersection of Pacific Coast Highway/Marian Drive currently operates at unacceptable LOS E during the AM peak hour.

10.1.2 Existing Plus Project Traffic Conditions

Review of column 2 of *Table 10-1* indicates that three of the sixteen state-controlled study intersections are forecast to operate at an unacceptable service level during the AM and/or PM peak hour with the addition of project traffic to existing traffic. The intersections of Pacific Coast Highway/2nd Street, Pacific Coast Highway/Marina Drive and Seal Beach Boulevard/Pacific Coast Highway are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours. The remaining state-controlled key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to existing traffic.

As shown in column 3 of *Table 10-1*, the implementation of improvements at the impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours. Refer to Section 12.5.1 for details on the recommended improvements.

10.2 Year 2019 Traffic Conditions

Table 10-2 summarizes the Year 2019 peak hour HCM level of service results at the sixteen state-controlled study intersections within the study area. The first column (1) of HCM/LOS values in *Table 10-2* presents Year 2019 cumulative traffic conditions based on existing intersection geometry, but without any project generated traffic. The second column (2) presents future forecast traffic conditions with the addition of Project traffic and indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report. The third column (3) indicates the anticipated operating conditions with implementation of improvements recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

10.2.1 Year 2019 Cumulative Traffic Conditions

An analysis of future (Year 2019) cumulative traffic conditions indicates that one of the state-controlled study intersections is forecast to operate at an unacceptable service level during the AM and/or PM peak hours. The intersection of Pacific Coast Highway/Marina Drive is forecast to operate at unacceptable LOS E during the AM peak hour. The remaining state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours in the Year 2019.

Please note that the level of service results for the intersections of Bellflower Boulevard/7th Street (key study intersection 7) and Bellflower Boulevard/Pacific Coast Highway (key study intersection 9) include improvements planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The planned improvements are summarized in Section 12.2.

10.2.2 Year 2019 Cumulative Plus Project Traffic Conditions

Review of column 2 of *Table 10-2* indicates that three of the sixteen state-controlled study intersections are forecast to operate at an unacceptable service level during the AM and/or PM peak hours with the addition of project traffic in the Year 2019. The intersections of Pacific Coast Highway/2nd Street, Pacific Coast Highway/Marina Drive and Seal Beach Boulevard/Pacific Coast

Highway are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours. The remaining state-controlled key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2019.

As shown in column 3 of *Table 10-2*, the implementation of improvements at the three impacted key study intersections completely offsets the impact of project traffic and the three key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours. Refer to Section 12.5.2 for details on the recommended improvements.

Appendix G presents the existing plus project and Year 2019 HCM/LOS calculations for the state-controlled study intersections for the AM and PM peak hours.

TABLE 10-1
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ³⁶			(3) Existing Plus Project With Improvements Traffic Conditions		
		HCM	LOS	HCM	LOS	Significant Impact	HCM	LOS	Significant Impact
2. Pacific Coast Highway at Clark Avenue	AM	22.5 s/v	C	23.1 s/v	C	No	--	--	--
	PM	24.2 s/v	C	24.7 s/v	C	No	--	--	--
3. Pacific Coast Highway at Anaheim Street	AM	26.1 s/v	C	26.4 s/v	C	No	--	--	--
	PM	29.3 s/v	C	34.9 s/v	C	No	--	--	--
6. Pacific Coast Highway at 7th Street	AM	35.8 s/v	D	36.1 s/v	D	No	--	--	--
	PM	34.9 s/v	C	35.9 s/v	D	No	--	--	--
7. Bellflower Boulevard at 7th Street	AM	33.7 s/v	C	33.8 s/v	C	No	--	--	--
	PM	30.1 s/v	C	30.1 s/v	C	No	--	--	--
8. Studebaker Road at SR-22 Westbound Ramps	AM	12.5 s/v	B	12.7 s/v	B	No	--	--	--
	PM	23.3 s/v	C	24.2 s/v	C	No	--	--	--
9. Bellflower Boulevard at Pacific Coast Highway	AM	27.6 s/v	C	29.2 s/v	C	No	--	--	--
	PM	25.6 s/v	C	30.5 s/v	C	No	--	--	--
10. Studebaker Road at SR-22 Eastbound Ramps	AM	13.6 s/v	B	13.8 s/v	B	No	--	--	--
	PM	16.8 s/v	B	17.9 s/v	B	No	--	--	--
11. Pacific Coast Highway at Loynes Drive	AM	16.8 s/v	B	16.9 s/v	B	No	--	--	--
	PM	26.3 s/v	C	27.2 s/v	C	No	--	--	--

Notes: s/v = seconds per vehicle

³⁶ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

TABLE 10-1 (CONTINUED)
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions ³⁷			(3) Existing Plus Project With Improvements Traffic Conditions		
		HCM	LOS	HCM	LOS	Significant Impact	HCM	LOS	Significant Impact
17. Pacific Coast Highway at 2nd Street	AM	41.7 s/v	D	43.1 s/v	D	No	38.7 s/v	D	No
	PM	41.0 s/v	D	56.9 s/v	E	Yes	44.8 s/v	D	No
22. Pacific Coast Highway at Studebaker Rd	AM	17.2 s/v	B	17.7 s/v	B	No	--	--	--
	PM	28.2 s/v	C	31.0 s/v	C	No	--	--	--
23. Pacific Coast Highway at Marina Drive	AM	36.5 s/v	E	39.1 s/v	E	Yes	16.4 s/v	B	No
	PM	19.9 s/v	C	21.5 s/v	C	No	15.6 s/v	B	No
24. Pacific Coast Highway at Main/Bolsa Avenue	AM	14.3 s/v	B	15.1 s/v	B	No	--	--	--
	PM	16.0 s/v	B	17.2 s/v	B	No	--	--	--
25. Seal Beach Boulevard at Pacific Coast Highway	AM	53.1 s/v	D	57.9 s/v	E	Yes	47.2 s/v	D	No
	PM	41.1 s/v	D	43.4 s/v	D	No	42.2 s/v	D	No
28. Pacific Coast Highway at Channel Drive	AM	5.3 s/v	A	5.3 s/v	A	No	--	--	--
	PM	7.0 s/v	A	7.0 s/v	A	No	--	--	--
29. Pacific Coast Highway at 1st Street	AM	11.7 s/v	B	12.1 s/v	B	No	--	--	--
	PM	12.7 s/v	B	13.5 s/v	B	No	--	--	--
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	AM	15.2 s/v	C	15.4 s/v	C	No	--	--	--
	PM	26.7 s/v	D	27.6 s/v	D	No	--	--	--

Notes: s/v = seconds per vehicle

³⁷ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

TABLE 10-2
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Year 2019 Cumulative Traffic Conditions		(2) Year 2019 Cumulative Plus Project Traffic Conditions ³⁸			(3) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions		
		HCM	LOS	HCM	LOS	Significant Impact	HCM	LOS	Significant Impact
2. Pacific Coast Highway at Clark Avenue	AM	24.3 s/v	C	24.5 s/v	C	No	--	--	--
	PM	25.3 s/v	C	26.7 s/v	C	No	--	--	--
3. Pacific Coast Highway at Anaheim Street	AM	27.1 s/v	C	27.3 s/v	C	No	--	--	--
	PM	30.6 s/v	C	31.9 s/v	C	No	--	--	--
6. Pacific Coast Highway at 7th Street	AM	37.8 s/v	D	38.6 s/v	D	No	--	--	--
	PM	36.6 s/v	D	37.9 s/v	D	No	--	--	--
7. Bellflower Boulevard at 7th Street	AM	35.3 s/v	D ³⁹	37.4 s/v	D ³⁹	No	--	--	--
	PM	32.2 s/v	C	32.6 s/v	C	No	--	--	--
8. Studebaker Road at SR-22 Westbound Ramps	AM	14.1 s/v	B	14.2 s/v	B	No	--	--	--
	PM	26.1 s/v	C	27.6 s/v	C	No	--	--	--
9. Bellflower Boulevard at Pacific Coast Highway	AM	29.2 s/v	C ³⁹	29.2 s/v	C ³⁹	No	--	--	--
	PM	30.0 s/v	C	32.5 s/v	C	No	--	--	--
10. Studebaker Road at SR-22 Eastbound Ramps	AM	14.0 s/v	B	14.1 s/v	B	No	--	--	--
	PM	21.7 s/v	C	23.2 s/v	C	No	--	--	--
11. Pacific Coast Highway at Loynes Drive	AM	17.4 s/v	B	17.5 s/v	B	No	--	--	--
	PM	27.4 s/v	C	28.4 s/v	C	No	--	--	--

Notes: s/v = seconds per vehicle

³⁸ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

³⁹ The LOS calculations for this intersection include improvements planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. Refer to Section 12.2 (planned improvements).

TABLE 10-2 (CONTINUED)
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Year 2019 Cumulative Traffic Conditions		(2) Year 2019 Cumulative Plus Project Traffic Conditions ⁴⁰			(3) Year 2019 Cumulative Plus Project With Improvements Traffic Conditions		
		HCM	LOS	HCM	LOS	Significant Impact	HCM	LOS	Significant Impact
17. Pacific Coast Highway at 2nd Street	AM	45.0 s/v	D	47.5 s/v	D	No	40.0 s/v	D	No
	PM	44.1 s/v	D	55.7 s/v	E	Yes	48.4 s/v	D	No
22. Pacific Coast Highway at Studebaker Rd	AM	20.9 s/v	C	21.4 s/v	C	No	--	--	--
	PM	33.3 s/v	C	37.5 s/v	D	No	--	--	--
23. Pacific Coast Highway at Marina Drive	AM	38.5 s/v	E	41.3 s/v	E	Yes	19.5 s/v	B	No
	PM	23.2 s/v	C	25.5 s/v	D	No	18.2 s/v	B	No
24. Pacific Coast Highway at Main/Bolsa Avenue	AM	15.0 s/v	B	16.1 s/v	B	No	--	--	--
	PM	17.0 s/v	B	18.5 s/v	B	No	--	--	--
25. Seal Beach Boulevard at Pacific Coast Highway	AM	54.9 s/v	D	57.0 s/v	E	Yes	51.4 s/v	D	No
	PM	46.4 s/v	D	50.4 s/v	D	No	48.3 s/v	D	No
28. Pacific Coast Highway at Channel Drive	AM	5.3 s/v	A	5.3 s/v	A	No	--	--	--
	PM	7.1 s/v	A	7.2 s/v	A	No	--	--	--
29. Pacific Coast Highway at 1st Street	AM	13.1 s/v	B	13.5 s/v	B	No	--	--	--
	PM	14.0 s/v	B	15.0 s/v	B	No	--	--	--
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	AM	15.2 s/v	C	15.4 s/v	C	No	--	--	--
	PM	30.7 s/v	D	31.8 s/v	D	No	--	--	--

Notes: s/v = seconds per vehicle

⁴⁰ Includes the removal of the existing Seaport Marina Hotel (170 Rooms) and construction of the proposed Project.

11.0 SITE ACCESS EVALUATION

11.1 Level of Service Analysis For Project Access Locations

As previously shown in *Figure 2-2*, access to the proposed Project will be provided via two driveways located along Pacific Coast Highway (referred to as Driveway No. 1 and No. 2), via three driveways located along Marina Drive (referred to as Driveway No. 3, No. 4 and No. 5) and via one driveway located along 2nd Street (referred to as Driveway No. 6). The following describes the access assumptions for each project driveway.

Pacific Coast Highway:

- Driveway No. 1: Left-turn in/right-turn in and right-turn out driveway.
- Driveway No. 2: Full access signalized intersection, to be located opposite an existing driveway that now serves the Long Beach Marketplace.

Marina Drive:

- Driveway No. 3: Right-turn in and right-turn out driveway.
- Driveway No. 4: Right-turn in and right-turn out driveway.
- Driveway No. 5: Right-turn in and right-turn out driveway.

2nd Street:

- Driveway No. 6: Right-turn in and right-turn out driveway.

It is noted that Project Driveways No. 1, No. 3, No. 4, and No. 5 are existing driveways that will remain in their current location as part of the proposed Project. Relative to Driveway No. 1, eastbound (outbound) left-turn movements from this driveway to northbound Pacific Coast Highway is currently allowed, but will be prohibited as a part of the Project.

Table 11-1 summarizes the Year 2019 Cumulative plus Project peak hour level of service results for the six (6) project driveways. Review of *Table 11-1* shows that all six (6) project driveways are forecast to operate at acceptable LOS D or better during the AM and PM peak hours. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so comfortably, safely, and without undue congestion.

Appendix H presents the Year 2019 plus project ICU/LOS and HCM/LOS calculations for the project driveways.

11.2 Queuing Analysis For Project Access Locations

In response to City staff concerns, stacking/storage requirements at the Project driveways were evaluated. The queuing evaluation was conducted based on projected Year 2019 plus project peak hour traffic volumes and the Highway Capacity Manual (HCM) signalized and unsignalized methodology.

Table 11-2 presents the weekday peak hour 95th percentile queuing analysis results for the six project driveways. As shown in *Table 11-2*, adequate storage is provided at the six (6) project driveways except for the southbound left-turn lane and the dual eastbound left-turn lanes at

Driveway No. 2/Pacific Coast Highway. As currently proposed, the southbound left-turn lane at Driveway No. 2/Pacific Coast Highway will provide 130-feet of storage with a 90-foot transition. Based on the 95th percentile queuing results shown in *Table 11-2*, it is recommended that this turn pocket be lengthened by 50 feet to provide 180-feet of storage. Review of the proposed site plan indicates that this can be accommodated by shortening the proposed 150-foot northbound left-turn lane at Driveway No. 1/Pacific Coast Highway by 50 feet, resulting in a 100-foot northbound left-turn lane at Driveway No. 1. As shown in *Table 11-2*, a 100-foot northbound left-turn lane is more than adequate to accommodate the projected 95th percentile queue.

Although the 189-foot eastbound queue exceeds the proposed 150-foot dual eastbound left-turn lanes at Driveway No. 2/Pacific Coast Highway, it should be noted that additional storage capacity is available on-site within the drive aisles. Therefore, adequate storage will be provided for the dual eastbound left-turn lanes at Driveway No. 2/Pacific Coast Highway.

Appendix H also presents the LOS/queuing calculations for the project driveways.

11.3 Internal Circulation

The on-site circulation layout of the proposed Project, on an overall basis, appears generally adequate. Since detailed (to scale) site plans are not available for review at this time, it is recommended that prior to finalization of the project site plan, the appropriate turning templates (ASSHTO SU-30, WB-50 and fire trucks) be utilized to confirm that all vehicles can properly access and circulate through the site, and that all internal drive aisle widths, project driveway widths, and parking stall widths, especially within the parking garages, satisfy the City's minimum requirements.

TABLE 11-1
 YEAR 2019 CUMULATIVE PLUS PROJECT
 DRIVEWAY PEAK HOUR LEVELS OF SERVICE SUMMARY

Driveway	Time Period	Intersection Control	Year 2019 Cumulative Plus Project	
			ICU/Delay	LOS
A. Pacific Coast Highway at Project Driveway No. 1	AM	One-Way	22.3 s/v	C
	PM	Stop	30.1 s/v	D
B. Pacific Coast Highway at Project Driveway No. 2	AM	8Ø Traffic	0.704 / 40.8 s/v	C / D
	PM	Signal	0.736 / 53.6 s/v	C / D
C. Marina Drive at Project Driveway No. 3	AM	One-Way	9.4 s/v	A
	PM	Stop	10.3 s/v	B
D. Marina Drive at Project Driveway No. 4	AM	One-Way	9.4 s/v	A
	PM	Stop	10.6 s/v	B
E. Marina Drive at Project Driveway No. 5	AM	One-Way	10.2 s/v	B
	PM	Stop	11.6 s/v	B
F. Project Driveway No. 6 at 2nd Street	AM	One-Way	25.8 s/v	D
	PM	Stop	33.9 s/v	D

Notes:

- **Delay/LOS** values indicate adverse service levels based on City of Long Beach LOS standards
- s/v = seconds per vehicle

TABLE 11-2
WEEKDAY PEAK HOUR QUEUING ANALYSIS

Key Study Intersection	Estimated/ Proposed Storage Provided (feet)	Year 2019 Cumulative Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required ⁴¹	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required ⁴¹	Adequate Storage (Yes/No)
A. Pacific Coast Highway at Driveway 1					
<i>Northbound Left-Turn</i>	150'	22'	Yes	22'	Yes
<i>Southbound Right-Turn</i>	340'	22'	Yes	22'	Yes
<i>Eastbound Right-Turn</i>	165'	22'	Yes	40'	Yes
B. Pacific Coast Highway at Driveway 2					
<i>Northbound Left -Turn</i>	200'	37'	Yes	135'	Yes
<i>Southbound Left-Turn</i>	130'	80'	Yes	153'	No
<i>Southbound Right-Turn</i>	370'	22'	Yes	22'	Yes
<i>Dual Eastbound Left-Turns</i>	150'	67'	Yes	189'	No
<i>Eastbound Through/Right-Turn</i>	150'	22'	Yes	22'	Yes
<i>Westbound Left-Turn</i>	90'	22'	Yes	29'	Yes
<i>Westbound Through/Right-Turn</i>	90'	22'	Yes	22'	Yes

⁴¹ Queue is based on the 95th Percentile Queue and is reported in total queue length (feet).

TABLE 11-2 (CONTINUED)
WEEKDAY PEAK HOUR QUEUING ANALYSIS

Key Study Intersection	Estimated/ Proposed Storage Provided (feet)	Year 2019 Cumulative Plus Project Traffic Conditions				
		AM Peak Hour		PM Peak Hour		
		Max. Queue/ Min. Storage Required ⁴²	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required ⁴²	Adequate Storage (Yes/No)	
C. Marina Drive at Driveway 3	<i>Southbound Left -Turn</i>	75'	22'	Yes	22'	Yes
	<i>Westbound Right-Turn</i>	40'	22'	Yes	22'	Yes
D. Marina Drive at Driveway 4	<i>Westbound Right-Turn</i>	55'	22'	Yes	22'	Yes
E. Marina Drive at Driveway 5	<i>Westbound Right-Turn</i>	40'	22'	Yes	22'	Yes
F. Driveway 6 at 2 nd Street	<i>Northbound Right-Turn</i>	70'	22'	Yes	52'	Yes

⁴² Queue is based on the 95th Percentile Queue and is reported in total queue length (feet).

12.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where projected Project 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:

- mitigate the impact of 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 Project Specific Improvements

The following project design features that will be constructed by the proposed Project are recommended to ensure that adequate ingress and egress to the project site is provided:

- **Pacific Coast Highway Project Frontage:** Provide an acceleration/deceleration lane on Pacific Coast Highway along the project frontage. The deceleration lane will function as a southbound right-turn lane at Project Driveway No. 1 and at Project Driveway No. 2. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.
- **Pacific Coast Highway at Project Driveway No. 1:** Construct the project driveway and provide one inbound lane and one outbound lane (i.e. one eastbound right-turn lane). It is recommended that the median on Pacific Coast Highway be modified to prohibit eastbound (outbound) left-turns and restriped to provide one 100-foot northbound left-turn lane with a 90-foot transition. Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Pacific Coast Highway. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.
- **Pacific Coast Highway at Project Driveway No. 2:** Construct the project driveway and a new driveway that will serve the Long Beach Marketplace on the east side of Pacific Coast Highway. The project driveway will provide one inbound lane, dual 150-foot eastbound left-turn lanes and a 150-foot eastbound shared through/right-turn lane. The Long Beach Marketplace driveway will provide two inbound lanes, one 90-foot westbound left-turn lane and one 90-foot westbound shared through/right-turn lane. The median on Pacific Coast Highway will be modified to provide appropriate left-turn lane pockets and transitions in both the northbound and southbound directions. Install an eight-phase traffic signal. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.
- **Marina Drive at Project Driveway No. 3:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.

- **Marina Drive at Project Driveway No. 4:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.
- **Marina Drive at Project Driveway No. 5:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.
- **2nd Street at Project Driveway No. 6:** Construct the project driveway and provide one inbound lane and one outbound lane (i.e. one northbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on 2nd Street. The installation of these improvements is subject to the approval of the City of Long Beach.

12.2 Planned Improvements

The following improvements are planned by the City of Long Beach and consist of the following:

- **No. 1 – Bellflower Boulevard at Atherton Street:** Remove the third northbound through lane on Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach.
- **No. 7 – Bellflower Boulevard at 7th Street:** Remove the third northbound through lane on Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach and/or Caltrans.
- **No. 9 – Bellflower Boulevard at Pacific Coast Highway:** Remove one southbound through lane along Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach and/or Caltrans.

The following improvements are part of the AES Battery Energy Storage System Cumulative Project located at 690 Studebaker Road and are necessary to provide adequate ingress and egress to the site.

- **No. 12 – Studebaker Road at Loynes Drive:** Provide an exclusive southbound left-turn lane, an exclusive westbound left-turn lane and a westbound shared through/right-turn lane. Modify the existing traffic signal accordingly. The installation of these planned improvements is subject to the approval of the City of Long Beach.

12.3 Existing Plus Project Recommended Improvements

The results of the intersection capacity analysis presented previously in *Tables 8-1* and *9-1* shows that the proposed Project will significantly impact nine of the thirty-one (31) key study intersections under the “Existing Plus Project” traffic scenario. The following are improvements recommended to mitigate the weekday and Saturday existing plus project traffic impacts:

- **No. 8 – Studebaker Road at SR-22 WB Ramps:** Widen and restripe the westbound approach to provide a third westbound left-turn lane. Widen and restripe the southbound approach of Studebaker Road to provide a third southbound through lane. These improvements would require right-of-way acquisition at the on/off ramp and along the west side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered significant and unavoidable and a statement of overriding considerations will be required for this location.

It should be noted that this location is only significantly impacted by the proposed Project under the City of Long Beach ICU methodology. This location does not have a significant impact based on the Caltrans HCM methodology.

- **No. 14 – Bay Shore Avenue at 2nd Street:** Widen and restripe the northbound approach of Bay Shore Avenue to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition at the southeast corner of the intersection and may affect the existing sidewalk and/or existing public restroom building. This improvement would also require the elimination of short-term parking on Bay Shore Avenue adjacent to the Bay Shore Neighborhood Library. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection**. As such, the impact at this location is considered significant and unavoidable and a statement of overriding considerations will be required for this location.
- **No. 17 – Pacific Coast Highway at 2nd Street:** Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of

Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 19 – Studebaker Road at 2nd Street:** Widen and restripe the eastbound approach of 2nd Street to provide a third eastbound left-turn lane. Widen and restripe Studebaker Road to provide a third northbound receiving lane. These improvements would require right-of-way acquisition along the south side of 2nd Street and on the east side of Studebaker Road within the existing wetlands. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the south side of 2nd Street and on the northeast corner of the intersection**. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 20 – Seal Beach Boulevard at Westminster Avenue:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach, who is the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 22 – Pacific Coast Highway at Studebaker Road:** Convert the exclusive southbound right-turn lane on Pacific Coast Highway to a shared through/right-turn lane. Widen and restripe Pacific Coast Highway to provide a third southbound receiving lane. The third southbound receiving lane would require right-of-way acquisition from property owners on the southwest corner of the intersection in order to maintain the existing bike lane. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southwest corner of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 23 – Pacific Coast Highway at Marina Drive:** Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the

owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 24 – Pacific Coast Highway at Main Street/Bolsa Avenue:** Widen and restripe the northbound approach of Pacific Coast Highway to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners on the northeast corner and the southeast corner of the intersection. This improvement may also affect the existing building located on the northeast corner of the intersection and the existing parking spaces within Seal Beach Center located on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast and southeast corners of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

12.4 Year 2019 Plus Project Recommended Improvements

The results of the intersection capacity analysis presented previously in *Tables 8-2 and 9-2* shows that the proposed Project will significantly impact eleven of the thirty-one (31) key study intersections under the “Year 2019 Plus Project” traffic scenario. The following are improvements recommended to mitigate the weekday and Saturday Year 2019 plus project traffic impacts:

- **No. 8 – Studebaker Road at SR-22 WB Ramps:** *Same as those identified in Section 12.3.* Widen and restripe the westbound approach to provide a third westbound left-turn lane. Widen and restripe the southbound approach of Studebaker Road to provide a third southbound through lane. These improvements would require right-of-way acquisition at the on/off ramp and along the west side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location

is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

It should be noted that this location is only significantly impacted by the proposed Project under the City of Long Beach ICU methodology. This location does not have a significant impact based on the Caltrans HCM methodology.

- **No. 12 – Studebaker Road at Loynes Drive:** Widen and restripe the northbound approach of Studebaker Road to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners along the east side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the east side of Studebaker Road**. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 14 – Bay Shore Avenue at 2nd Street:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Bay Shore Avenue to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition at the southeast corner of the intersection and may affect the existing sidewalk and/or existing public restroom building. This improvement would also require the elimination of short-term parking on Bay Shore Avenue adjacent to the Bay Shore Neighborhood Library. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection**. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 17 – Pacific Coast Highway at 2nd Street:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as approval from Caltrans, who is also the owner/operator of**

this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 19 – Studebaker Road at 2nd Street:** *Same as those identified in Section 12.3.* Widen and restripe the eastbound approach of 2nd Street to provide a third eastbound left-turn lane. Widen and restripe Studebaker Road to provide a third northbound receiving lane. These improvements would require right-of-way acquisition along the south side of 2nd Street and on the east side of Studebaker Road within the existing wetlands. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the south side of 2nd Street and on the northeast corner of the intersection.** As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 20 – Seal Beach Boulevard at Westminster Avenue:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach, who is the owner/operator of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 22 – Pacific Coast Highway at Studebaker Road:** *Same as those identified in Section 12.3.* Convert the exclusive southbound right-turn lane on Pacific Coast Highway to a shared through/right-turn lane. Widen and restripe Pacific Coast Highway to provide a third southbound receiving lane. The third southbound receiving lane would require right-of-way acquisition from property owners on the southwest corner of the intersection in order to maintain the existing bike lane. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southwest corner of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 23 – Pacific Coast Highway at Marina Drive:** *Same as those identified in Section 12.3.* Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As

such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 24 – Pacific Coast Highway at Main Street/Bolsa Avenue:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Pacific Coast Highway to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners on the northeast corner and the southeast corner of the intersection. This improvement may also affect the existing building located on the northeast corner of the intersection and the existing parking spaces within Seal Beach Center located on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast and southeast corners of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **No. 29 – Pacific Coast Highway at 1st Street:** Widen and restripe the southbound approach of Pacific Coast Highway to provide an exclusive southbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the northwest corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northwest corner of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

12.5 Recommended Improvements – Caltrans Methodology

12.5.1 Existing Plus Project Recommended Improvements

The following improvements listed below have been identified to mitigate the existing plus project traffic impacts (Caltrans methodology) at the following intersections:

- **No. 17 – Pacific Coast Highway at 2nd Street:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.
- **No. 23 – Pacific Coast Highway at Marina Drive:** *Same as those identified in Section 12.3.* Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.
- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** *Same as those identified in Section 12.3.* Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection** and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

12.5.2 Year 2019 Plus Project Recommended Improvements

The following improvements listed below have been identified to mitigate the Year 2019 plus project traffic impacts (Caltrans methodology) at the following intersections:

- **No. 17 – Pacific Coast Highway at 2nd Street:** *Same as those identified in Section 12.5.1.* Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.
- **No. 23 – Pacific Coast Highway at Marina Drive:** *Same as those identified in Section 12.5.1.* Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.
- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** *Same as those identified in Section 12.5.1.* Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection** and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

Table 12-1 identifies the incremental intersection improvements, which are summarized above, needed by the relevant study years (i.e. existing plus project and Year 2019 plus project) to mitigate the Project's impact based on the appropriate jurisdictions significance criteria and to maintain, where possible, acceptable service levels based on the LOS standards defined in this report. *Figure 12-1* graphically illustrates all of the recommended improvements. This figure also illustrates the project-specific improvements

12.6 Transportation Improvement Fee

Pursuant to the requirements of the City of Long Beach Municipal Code, Transportation Improvement Fees will be required of the Project. The purpose of the Transportation Improvement Fees is to implement the City's general plan growth management element, to ensure that new growth pays its share of regional traffic mitigation and to implement the City's circulation/transportation general plan element to improve, maintain and regulate the network of highways, and streets, to ensure their safe and efficient use.

The payment of Transportation Improvement Fees shall be submitted to the City of Long Beach Community Development Department for the mitigation of off-site traffic impacts generated by the Project and shall be payable at the time of building permit issuance for the first building constructed on the project site. The Transportation Improvement Fee, based on the size of all new commercial development in the City of Long Beach, is assessed as shown below:

- Retail (City-Wide): \$3.00 per square-foot

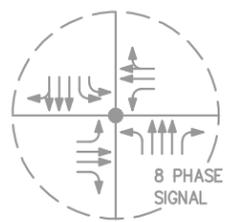
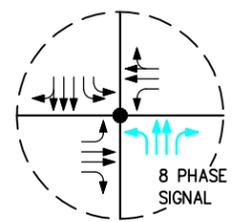
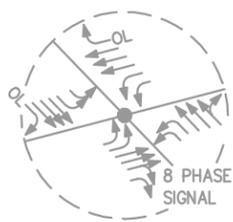
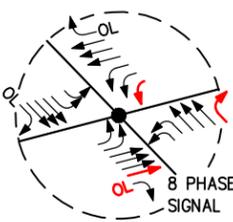
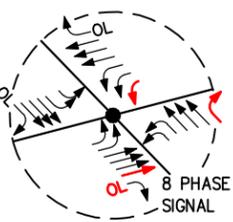
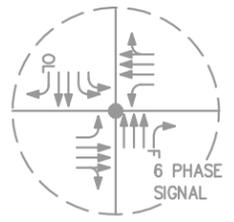
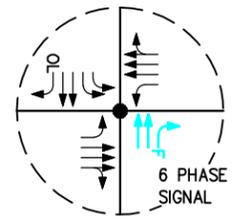
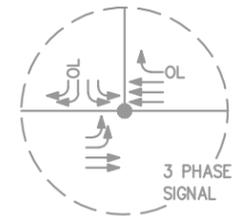
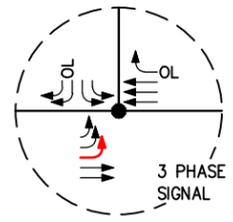
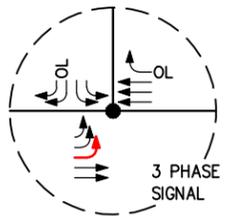
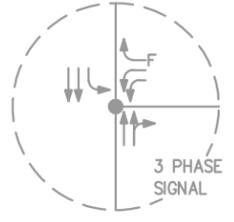
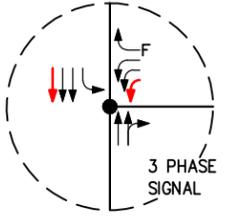
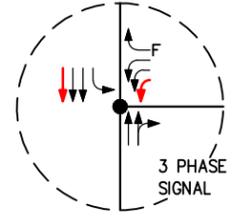
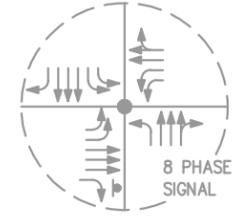
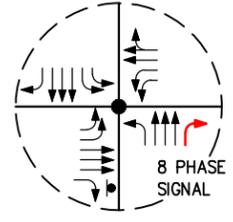
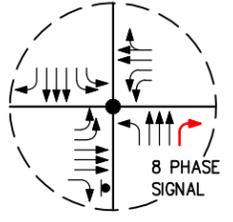
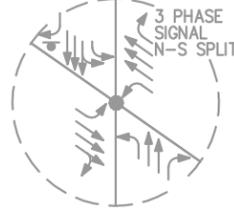
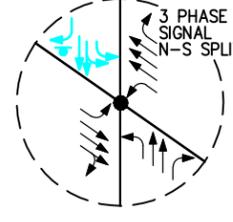
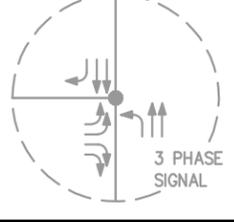
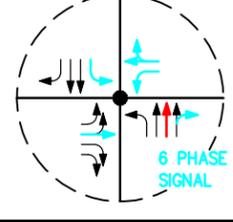
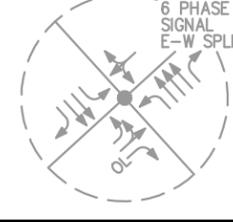
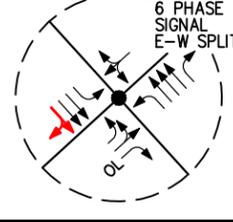
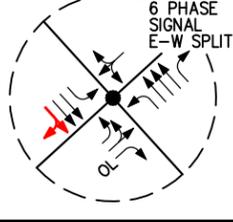
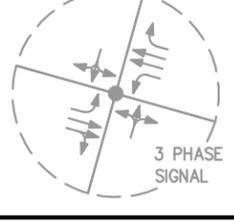
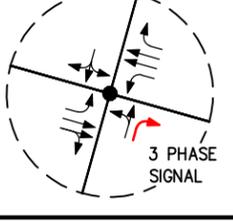
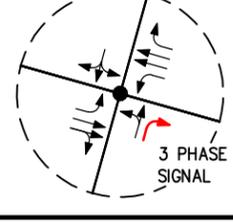
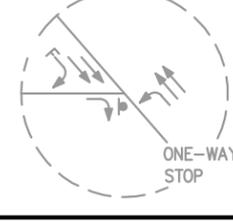
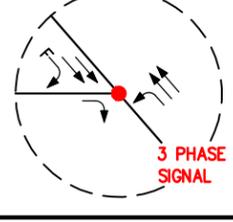
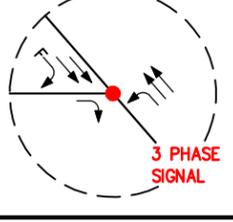
Based on a total Project development of 245,000 SF of commercial (retail/restaurant) space, the proposed 2nd + PCH Project can be expected to pay up to \$735,000 in Transportation Improvement Fees. The precise fee, plus any credit for existing development, will be determined by the City upon issuance of project building permits.

With respect to project impacts at intersections under the jurisdiction of the City of Seal Beach and Caltrans, it should also be noted that under CEQA, a fair share monetary contribution to a mitigation fund is adequate mitigation if the fund is tied to a reasonable plan that the relevant agency is committed to implementing. However, these cities and Caltrans do not have mitigation fund programs in place for these improvements to which a development project in the City of Long Beach can contribute.

It should be noted that the project-specific improvements listed in Section 12.1 for Pacific Coast Highway (i.e. Pacific Coast Highway frontage, Project Driveway No. 1 and Project Driveway No. 2) will cost approximately \$1,000,000.00 and will be paid for and constructed by the project applicant.

TABLE 12-1
RECOMMENDED IMPROVEMENTS

Key Location	Jurisdiction	Improvement Description	Improvements by Scenario / Jurisdictional Impact					
			(1) Existing Plus Project			(2) Year 2019 Cumulative Plus Project		
			Long Beach	Seal Beach	Caltrans	Long Beach	Seal Beach	Caltrans
8. Studebaker Road at SR-22 WB Ramps	Long Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Construct 3rd SB through lane. ▪ Construct 3rd WB left-turn lane. ▪ Modify existing traffic signal. 	X	--	--	X	--	--
12. Studebaker Road at Loynes Drive	Long Beach	<ul style="list-style-type: none"> ▪ Construct 3rd NB through lane. ▪ Modify existing traffic signal 	--	--	--	X	--	--
14. Bay Shore Avenue at 2 nd Street	Long Beach	<ul style="list-style-type: none"> ▪ Construct NB right-turn lane. ▪ Modify existing traffic signal. 	X	--	--	X	--	--
17. Pacific Coast Highway at 2 nd Street	Long Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Construct NB right-turn lane. ▪ Construct 4th EB through lane. ▪ Construct 3rd WB left-turn lane. ▪ Modify existing traffic signal and provide EB right-turn overlap phase. 	X	--	X	X	--	X
19. Studebaker Road at 2 nd Street	Long Beach	<ul style="list-style-type: none"> ▪ Construct 3rd EB left-turn lane. ▪ Modify existing traffic signal. 	X	--	--	X	--	--
20. Seal Beach Boulevard at Westminster Avenue	Seal Beach	<ul style="list-style-type: none"> ▪ Construct NB right-turn lane. ▪ Modify existing traffic signal. 	--	X	--	--	X	--
22. Pacific Coast Highway at Studebaker Road	Long Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Convert the SB right-turn lane to a SB shared through/right-turn lane. ▪ Modify existing traffic signal. 	X	--	--	X	--	--
23. Pacific Coast Highway at Marina Drive	Seal Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Install a three-phase traffic signal. 	--	X	X	--	X	X
24. Pacific Coast Highway at Main Street/Bolsa Avenue	Seal Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Construct 3rd NB through lane ▪ Modify existing traffic signal. 	--	X	--	--	X	--
25. Seal Beach Boulevard at Pacific Coast Highway	Seal Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Construct NB right-turn lane. ▪ Modify existing traffic signal. 	--	X	X		X	X
29. Pacific Coast Highway at 1 st Street	Seal Beach/ Caltrans	<ul style="list-style-type: none"> ▪ Construct SB right-turn lane. ▪ Modify existing traffic signal. 	--	--	--	--	X	--

INTERSECTION	EXISTING	EXISTING PLUS PROJECT	YEAR 2019 PLUS PROJECT	INTERSECTION	EXISTING	EXISTING PLUS PROJECT	YEAR 2019 PLUS PROJECT
① BELLFLOWER BLVD @ ATHERTON ST		NO CHANGE		①⑦ PACIFIC COAST HIGHWAY @ 2ND ST			
⑦ BELLFLOWER BLVD @ 7TH ST		NO CHANGE		①⑨ STUDEBAKER RD @ 2ND ST			
⑧ STUDEBAKER RD @ SR-22 WB RAMPS				②⑩ SEAL BEACH BLVD @ WESTMINSTER AVE			
⑨ BELLFLOWER BLVD @ PACIFIC COAST HIGHWAY		NO CHANGE		②① MARINA DR @ STUDEBAKER RD			
⑫ STUDEBAKER RD @ LOYNES DR		NO CHANGE		②② PACIFIC COAST HIGHWAY @ STUDEBAKER RD			
⑭ BAY SHORE AVE @ 2ND ST				②③ PACIFIC COAST HIGHWAY @ MARINA DR			

KEY

-  = APPROACH LANE ASSIGNMENT
-  = PLANNED IMPROVEMENTS
-  = RECOMMENDED IMPROVEMENTS
-  = PROJECT SPECIFIC IMPROVEMENTS
-  = TRAFFIC SIGNAL,  = STOP SIGN

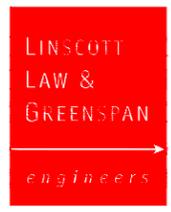


FIGURE 12-1A

RECOMMENDED IMPROVEMENTS
RANCHO LA HABRA, CITY OF LA HABRA

INTERSECTION	EXISTING	EXISTING PLUS PROJECT	YEAR 2019 PLUS PROJECT	INTERSECTION	EXISTING	EXISTING PLUS PROJECT	YEAR 2019 PLUS PROJECT
24 PACIFIC COAST HIGHWAY @ MAIN ST/BOLSA AVE	 5 PHASE SIGNAL	 5 PHASE SIGNAL	 5 PHASE SIGNAL	D MARINA DR @ PROJECT DWY NO. 4	DOES NOT EXIST	 ONE-WAY STOP	 ONE-WAY STOP
25 SEAL BEACH BLVD @ PACIFIC COAST HIGHWAY	 6 PHASE SIGNAL N-S SPLIT	 6 PHASE SIGNAL N-S SPLIT	 6 PHASE SIGNAL N-S SPLIT	E MARINA DR @ PROJECT DWY NO. 5	DOES NOT EXIST	 ONE-WAY STOP	 ONE-WAY STOP
29 PACIFIC COAST HIGHWAY @ 1ST STREET	 6 PHASE SIGNAL E/W SPLIT	NO CHANGE	 6 PHASE SIGNAL E/W SPLIT	F PROJECT DWY NO. 6 2ND ST	DOES NOT EXIST	 ONE-WAY STOP	 ONE-WAY STOP
A PACIFIC COAST HIGHWAY @ PROJECT DWY NO. 1	DOES NOT EXIST	 ONE-WAY STOP	 ONE-WAY STOP				
B PACIFIC COAST HIGHWAY @ PROJECT DWY NO. 2	DOES NOT EXIST	 8 PHASE SIGNAL	 8 PHASE SIGNAL				
C MARINA DR @ PROJECT DWY NO. 3	DOES NOT EXIST	 ONE-WAY STOP	 ONE-WAY STOP				

- KEY
- = APPROACH LANE ASSIGNMENT
 - = PLANNED IMPROVEMENTS
 - = RECOMMENDED IMPROVEMENTS
 - = PROJECT SPECIFIC IMPROVEMENTS
 - = TRAFFIC SIGNAL, = STOP SIGN

FIGURE 12-1B

RECOMMENDED IMPROVEMENTS
 RANCHO LA HABRA, CITY OF LA HABRA

13.0 CONGESTION MANAGEMENT PROGRAM COMPLIANCE ASSESSMENT

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system.

13.1 Traffic Impact Review

As required by the current *Congestion Management Program for Los Angeles County*, a review has been made of designated monitoring locations on the CMP highway system for potential impact analysis. Per CMP TIA criteria, the geographic area examined in the TIA must include the following, at a minimum:

All CMP arterial monitoring intersections, including freeway on and off-ramp intersections, where the project will add 50 or more trips during either the AM or PM weekday peak hours.

Mainline freeway-monitoring stations where the project will add 150 or more trips, in either direction, during the AM or PM weekday peak hours.

13.1.1 Intersections

The following CMP intersection monitoring locations within the project study area have been identified:

<u>CMP Station</u>	<u>Int. No.</u>	<u>Intersection/Jurisdiction</u>
No. 36	6	Pacific Coast Highway at 7 th Street
No. 39	17	Pacific Coast Highway at Westminster Avenue (2 nd Street)

As stated earlier, the CMP guidelines require that arterial monitoring intersection locations must be examined if the proposed project will add 50 or more trips during either the AM or PM weekday peak hours (of adjacent street traffic) at CMP monitoring intersections. Based on the proposed project's trip generation potential, trip distribution and trip assignment, the Project will add 50 or more trips at the identified CMP intersections during the weekday AM peak hour or PM peak hour. Therefore a CMP intersection traffic impact analysis is required.

Pacific Coast Highway at 7th Street – Based on the results of a detailed analysis of project added trips to the CMP system, approximately 67 trips during the AM peak hour and 131 trips during the PM peak hour will be added by the project at this location. Per CMP TIA guidelines, intersection level of service analysis is therefore required. The impact analysis is discussed in detail in Section 8.0 of this traffic study report and the results are summarized in *Table 8-2*. As presented previously, the analysis indicates that the Project will not increase demand at this key intersection by two percent (0.02) or more during the AM and PM peak hours and therefore the proposed Project will not have a CMP impact at this location.

Pacific Coast Highway at 2nd Street – Based on the results of a detailed analysis of project added trips to the CMP system, approximately 209 trips during the AM peak hour and 504 trips during the PM peak hour will be added by the project at this location. Per CMP TIA guidelines, intersection level of service analysis is therefore required. The impact analysis is discussed in detail in Section 8.0 of this traffic study report and the results are summarized in *Table 8-2*. As presented previously, the analysis indicates that the Project will increase demand at this key intersection by two percent (0.020) or more during the AM peak hour (i.e. 0.034) and during the PM peak hour (i.e. 0.102). However, with implementation of recommended improvements at this location, the impact of the proposed Project will be offset.

13.1.2 Freeways

The following CMP freeway monitoring location in the project vicinity has been identified:

<u>CMP Station</u>	<u>Intersection/Jurisdiction</u>
No. 1065	I-405, north of Route 22

As stated earlier, the CMP TIA guidelines require that freeway monitoring locations must be examined if the proposed project will add 150 or more trips (in either direction) during either the AM or PM weekday peak periods. Based on the project's trip generation potential and distribution pattern, the proposed Project will not add more than 150 trips during the AM or PM peak hour at this CMP mainline freeway-monitoring location. Therefore, a CMP freeway traffic impact analysis is not required.

13.2 Transit Impact Review

As required by the current *Congestion Management Program for Los Angeles County*, a review has been made of the potential impacts of the project on transit service. As previously discussed and shown in *Figures 3-5* and *3-6*, a number of transit services exist in the project area, necessitating the following transit impact review.

The project trip generation, as shown in *Table 5-2*, was adjusted by values set forth in the CMP (i.e. person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of the total person trips) to estimate project-related transit trip generation. Pursuant to the CMP guidelines, the proposed Project is forecast to generate 20 transit trips (11 inbound and 9 outbound) during the AM peak hour and 39 transit trips (21 inbound and 18 outbound) during the PM peak hour. Over a 24-hour period the proposed Project is forecasted to generate 670 daily weekday transit trips.

It is anticipated that the existing transit service in the project area would be able to accommodate the project generated transit trips. Therefore, given the number of transit trips generated by the project and the existing transit routes in the project vicinity, it is concluded that the existing public transit system would not be significantly impacted by the proposed Project.

14.0 CALTRANS FREEWAY ANALYSIS

Neither the City of Long Beach nor the neighboring cities have devised methods to measure congestion and project impacts on freeways. Therefore, methods used by Caltrans have been used. Caltrans requires the use of analysis methods provided in the Highway Capacity Manual (*HCM*) for the analysis of basic freeway segments and freeway ramps. 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 project impacts at the study freeway segments. 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), or increase the density on a facility operating at an unacceptable level.

Based on Caltrans request, quantified analysis is required for freeway segments and ramps along the SR-22 Freeway, the I-605 Freeway and the I-405 Freeway during the AM and PM peak hours. A total of twelve (12) Caltrans freeway segments and four (4) Caltrans freeway ramps were analyzed.

14.1 Freeway Mainline Segment Analysis

Basic Freeway Segment Analysis for freeway segments was conducted at twelve (12) Caltrans freeway segments in the vicinity of the proposed Project. The following twelve (12) segments were included for analysis:

1. SR-22 eastbound, east of Studebaker Road
2. SR-22 westbound, east of Studebaker Road
3. I-605 northbound, south of Katella Avenue
4. I-605 southbound, south of Katella Avenue
5. I-405 northbound, between Bellflower Boulevard and Woodruff Avenue
6. I-405 northbound, between Woodruff Avenue and Palo Verde Avenue
7. I-405 northbound, between Palo Verde Avenue and Studebaker Road
8. I-405 northbound, south of Studebaker Road
9. I-405 southbound, between Bellflower Boulevard and Woodruff Avenue
10. I-405 southbound, between Woodruff Avenue and Palo Verde Avenue
11. I-405 southbound, between Palo Verde Avenue and Studebaker Road
12. I-405 southbound, south of Studebaker Road

14.1.1 Existing Plus Project Basic Freeway Segment Capacity Analysis

14.1.1.1 Existing Traffic Conditions

Table 14-1 summarizes the peak hour level of service results at the aforementioned twelve (12) freeway segments for Existing traffic conditions. Review of *Table 14-1* indicates that three (3) of the twelve (12) freeway segments currently operate at unacceptable LOS E during the AM and/or PM peak hours.

Appendix I contains the Basic Freeway Segment Analysis calculation worksheets for the twelve (12) freeway segments for Existing traffic conditions.

14.1.1.2 Existing Plus Project Traffic Conditions

Table 14-2 summarizes the peak hour level of service results at the twelve (12) freeway segments for Existing plus Project traffic conditions. The first column (1) presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 14-1*). The second column (2) presents Existing plus Project traffic conditions and the third column (3) indicates whether the traffic associated with the proposed project will have an impact based on the LOS standards defined in this report.

Review of *Table 14-2* indicates that with the addition of Project traffic, two (2) of the twelve (12) freeway segments are forecast to operate at an unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. Although the addition of Project trips are not anticipated to result in any new deficient service levels, the Project's contribution to the freeway system can be considered cumulatively significant at two (2) of the twelve freeway segments under this traffic impact analysis scenario.

Appendix I contains the Basic Freeway Segment Analysis calculation worksheets for the twelve (12) freeway segments for Existing Plus Project traffic conditions.

14.1.2 Year 2019 Basic Freeway Segment Capacity Analysis

Table 14-3 summarizes the peak hour level of service results at the twelve (12) freeway segments for Year 2019 Cumulative traffic conditions. The first column (1) presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 14-1*). The second column (2) presents Year 2019 Cumulative traffic conditions and the third column (3) presents Year 2019 Cumulative plus Project traffic conditions. The fourth (4) column indicates whether the traffic associated with the proposed project will have an impact based on the LOS standards defined in this report.

14.1.2.1 Year 2019 Cumulative Traffic Conditions

Review of column (2) of *Table 14-3* indicates that three (3) of the twelve (12) freeway segments are forecast to operate at an unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report.

14.1.2.2 Year 2019 Cumulative Plus Project Traffic Conditions

Review of columns (3) and (4) of *Table 14-3* indicates that with the addition of Project traffic, two (2) of the twelve (12) freeway segments are forecast to operate at an unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. Although the addition of Project trips are not anticipated to result in any new deficient service levels, the Project's contribution to the freeway system can be considered cumulatively significant at two (2) of the twelve freeway segments under this traffic impact analysis scenario.

Appendix I contains the Basic Freeway Segment Analysis calculation worksheets for the twelve (12) freeway segments for Year 2019 Cumulative plus Project traffic conditions.

14.1.3 Freeway Segment Traffic Improvements

A review of the level of service calculations summarized in *Tables 14-2* through *14-3* indicates that the development of the Project in combination with cumulative development and ambient traffic growth is anticipated to cumulatively impact two (2) of the twelve (12) mainline freeway segments assessed in the report (i.e. key freeway segments #1 and #2). However, the SR-22 Freeway is controlled exclusively by the State and there is no mechanism by which the lead agency (City of Long Beach) can construct or guarantee the construction of any improvements to these freeways segments. Therefore, the proposed Project's incremental impacts on key freeway study segments assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative mainline impacts to below significance thresholds or achieve acceptable service level goals.

TABLE 14-1
EXISTING PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY

Basic Freeway Segment	Time Period	Lanes	Project Trips	(1) Existing Traffic Conditions		
				Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS
<u>SR-22 Segments</u>						
1. SR-22 eastbound, <i>east of</i> Studebaker Road	AM	2	10	2,237	40.6	E
	PM		27	2,097	36.1	E
2. SR-22 westbound, <i>east of</i> Studebaker Road	AM	2	13	1,697	26.6	D
	PM		32	2,148	37.6	E
<u>I-605 Segments</u>						
3. I-605 northbound, <i>south of</i> Katella Avenue	AM	6	5	1,134	17.4	B
	PM		12	1,352	20.8	C
4. I-605 southbound, <i>south of</i> Katella Avenue	AM	6	7	827	12.7	B
	PM		14	947	14.6	B
<u>I-405 Segments</u>						
5. I-405 northbound, <i>between</i> Bellflower Boulevard and Woodruff Avenue	AM	6	0	1,622	25.2	C
	PM		3	1,427	22.0	C
6. I-405 northbound, <i>between</i> Woodruff Avenue and Palo Verde Avenue	AM	6	0	1,591	24.7	C
	PM		3	1,400	21.5	C
7. I-405 northbound, <i>between</i> Palo Verde Avenue and Studebaker Road	AM	6	0	1,653	25.8	C
	PM		3	1,455	22.4	C
8. I-405 northbound, <i>south of</i> Studebaker Road	AM	5	0	1,939	31.8	D
	PM		3	1,706	26.8	D
9. I-405 southbound, <i>between</i> Bellflower Boulevard and Woodruff Avenue	AM	6	1	1,459	22.5	C
	PM		5	1,785	28.4	D
10. I-405 southbound, <i>between</i> Woodruff Avenue and Palo Verde Avenue	AM	5	1	1,717	27.0	D
	PM		5	2,101	36.2	E
11. I-405 southbound, <i>between</i> Palo Verde Avenue and Studebaker Road	AM	6	1	1,487	22.9	C
	PM		5	1,819	29.1	D
12. I-405 southbound, <i>south of</i> Studebaker Road	AM	6	1	1,453	22.4	C
	PM		5	1,778	28.2	D

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

TABLE 14-2
EXISTING PLUS PROJECT PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY

	Time Period	(1) Existing Traffic Conditions			(2) Existing Plus Project Traffic Conditions			(3) Significant Impact	
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No	
Basic Freeway Segment									
<u>SR-22 Segments</u>									
1.	SR-22 eastbound, <i>east of</i> Studebaker Road	AM	2,237	40.6	E	2,243	40.8	E	Yes
	PM	2,097	36.1	E	2,111	36.5	E	Yes	
2.	SR-22 westbound, <i>east of</i> Studebaker Road	AM	1,697	26.6	D	1,704	26.8	D	No
	PM	2,148	37.6	E	2,165	38.2	E	Yes	
<u>I-605 Segments</u>									
3.	I-605 northbound, <i>south of</i> Katella Avenue	AM	1,134	17.4	B	1,135	17.5	B	No
	PM	1,352	20.8	C	1,354	20.8	C	No	
4.	I-605 southbound, <i>south of</i> Katella Avenue	AM	827	12.7	B	829	12.8	B	No
	PM	947	14.6	B	950	14.6	B	No	
<u>I-405 Segments</u>									
5.	I-405 northbound, <i>between</i> Bellflower Boulevard and Woodruff Avenue	AM	1,622	25.2	C	1,622	25.2	C	No
	PM	1,427	22.0	C	1,428	22.0	C	No	
6.	I-405 northbound, <i>between</i> Woodruff Avenue and Palo Verde Avenue	AM	1,591	24.7	C	1,591	24.7	C	No
	PM	1,400	21.5	C	1,401	21.6	C	No	
7.	I-405 northbound, <i>between</i> Palo Verde Avenue and Studebaker Road	AM	1,653	25.8	C	1,653	25.8	C	No
	PM	1,455	22.4	C	1,455	22.4	C	No	

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

TABLE 14-2 (CONTINUED)
EXISTING PLUS PROJECT PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY

Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Existing Plus Project Traffic Conditions			(3) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
<i>I-405 Segments (Cont.)</i>								
8. I-405 northbound, <i>south of</i> Studebaker Road	AM	1,939	31.8	D	1,939	31.8	D	No
	PM	1,706	26.8	D	1,707	26.8	D	No
9. I-405 southbound, <i>between</i> Bellflower Boulevard and Woodruff Avenue	AM	1,459	22.5	C	1,459	22.5	C	No
	PM	1,785	28.4	D	1,785	28.4	D	No
10. I-405 southbound, <i>between</i> Woodruff Avenue and Palo Verde Avenue	AM	1,717	27.0	D	1,718	27.0	D	No
	PM	2,101	36.2	E	2,102	36.2	E	No
11. I-405 southbound, <i>between</i> Palo Verde Avenue and Studebaker Road	AM	1,487	22.9	C	1,487	22.9	C	No
	PM	1,819	29.1	D	1,820	29.1	D	No
12. I-405 southbound, <i>south of</i> Studebaker Road	AM	1,453	22.4	C	1,454	22.4	C	No
	PM	1,778	28.2	D	1,779	28.3	D	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

TABLE 14-3
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY

Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Year 2019 Cumulative Traffic Conditions			(3) Year 2019 Cumulative Plus Project Traffic Conditions			(4) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
<u>SR-22 Segments</u>											
1. SR-22 eastbound, east of Studebaker Road	AM	2,237	40.6	E	2,323	43.9	E	2,328	44.1	E	Yes
	PM	2,097	36.1	E	2,194	39.1	E	2,209	39.6	E	Yes
2. SR-22 westbound, east of Studebaker Road	AM	1,697	26.6	D	1,783	28.3	D	1,790	28.5	D	No
	PM	2,148	37.6	E	2,234	40.5	E	2,251	41.1	E	Yes
<u>I-605 Segments</u>											
3. I-605 northbound, south of Katella Avenue	AM	1,134	17.4	B	1,168	18.0	B	1,169	18.0	B	No
	PM	1,352	20.8	C	1,393	21.4	C	1,395	21.5	C	No
4. I-605 southbound, south of Katella Avenue	AM	827	12.7	B	852	13.1	B	854	13.1	B	No
	PM	947	14.6	B	975	15.0	B	978	15.0	B	No
<u>I-405 Segments</u>											
5. I-405 northbound, between Bellflower Boulevard and Woodruff Avenue	AM	1,622	25.2	C	1,672	26.1	D	1,672	26.1	D	No
	PM	1,427	22.0	C	1,471	22.7	C	1,472	22.7	C	No
6. I-405 northbound, between Woodruff Avenue and Palo Verde Avenue	AM	1,591	24.7	C	1,640	25.6	C	1,640	25.6	C	No
	PM	1,400	21.5	C	1,443	22.2	C	1,443	22.2	C	No
7. I-405 northbound, between Palo Verde Avenue and Studebaker Road	AM	1,653	25.8	C	1,703	26.7	D	1,703	26.7	D	No
	PM	1,455	22.4	C	1,499	23.1	C	1,499	23.1	C	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

TABLE 14-3 (CONTINUED)
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY

Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Year 2019 Cumulative Traffic Conditions			(3) Year 2019 Cumulative Plus Project Traffic Conditions			(4) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
<i>I-405 Segments (Cont.)</i>											
8. I-405 northbound, <i>south of</i> Studebaker Road	AM	1,939	31.8	D	1,998	33.3	D	1,998	33.3	D	No
	PM	1,706	26.8	D	1,758	27.8	D	1,759	27.8	D	No
9. I-405 southbound, <i>between</i> Bellflower Boulevard and Woodruff Avenue	AM	1,459	22.5	C	1,503	23.2	C	1,503	23.2	C	No
	PM	1,785	28.4	D	1,839	29.5	D	1,840	29.6	D	No
10. I-405 southbound, <i>between</i> Woodruff Avenue and Palo Verde Avenue	AM	1,717	27.0	D	1,770	28.1	D	1,770	28.1	D	No
	PM	2,101	36.2	E	2,165	38.2	E	2,166	38.2	E	No
11. I-405 southbound, <i>between</i> Palo Verde Avenue and Studebaker Road	AM	1,487	22.9	C	1,532	23.7	C	1,532	23.7	C	No
	PM	1,819	29.1	D	1,875	30.3	D	1,875	30.3	D	No
12. I-405 southbound, <i>south of</i> Studebaker Road	AM	1,453	22.4	C	1,497	23.1	C	1,498	23.1	C	No
	PM	1,778	28.2	D	1,832	29.4	D	1,833	29.4	D	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

14.2 Freeway Merge/Diverge Ramp Junction Analysis

This section of the report presents a Freeway Ramp (Merge/Diverge) Analysis for the SR-22 Interchange at Studebaker Road. The analysis is consistent with Caltrans requirements and has been prepared using the methods provided in the *Highway Capacity Manual (HCM)*.

14.2.1 Existing Plus Project Ramp Junction Analysis

Table 14-4 summarizes the peak hour Level of Service results at the four (4) freeway ramp junctions for Existing Plus Project traffic conditions. The first column (1) presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) presents Existing Plus Project traffic conditions and the third column (3) indicates whether the traffic associated with the Project will have an impact based on the LOS standards defined in this report.

14.2.1.1 Existing Traffic Conditions

Review of column (1) of *Table 14-4* indicates that two (2) of the four (4) freeway ramps currently operate at an unacceptable level of service during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining two (2) freeway ramps (i.e. key freeway ramps #1 and #4) currently operate at an acceptable LOS D or better during the AM and PM peak hours.

14.2.1.2 Existing Plus Project Traffic Conditions

Review of column (2) of *Table 14-4* indicates that two (2) of the four (4) freeway ramps are forecast to operate at an unacceptable level of service with the addition of Project traffic during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining two (2) freeway ramps (i.e. key freeway ramps #1 and #4) are projected to continue to operate at LOS D or better with the addition of project generated traffic to existing traffic. The Project's contribution to the freeway system can be considered significantly impacted at two (2) of the four ramp junctions under this traffic scenario.

Appendix J contains the Freeway Merge/Diverge Ramp Junction Analysis calculation worksheets.

14.2.2 Year 2019 Ramp Junction Analysis

Table 14-5 summarizes the peak hour Level of Service results at the four (4) freeway ramps for Year 2019 Cumulative traffic conditions. The first column (1) lists forecast Year 2019 Cumulative traffic conditions and the second column (2) lists forecast Year 2019 Cumulative Plus Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will have an impact based on the LOS standards defined in this report.

14.2.2.1 Year 2019 Cumulative Traffic Conditions

Review of column (1) of *Table 14-5* indicates that two (2) of the four (4) freeway ramps are forecast to operate at an unacceptable level of service in the Year 2019 during the AM and/or PM peak hours. The remaining two (2) freeway ramps (i.e. key freeway ramps #1 and #4) are forecast to operate at an acceptable LOS D or better in the Year 2019 during the AM and PM peak hours.

14.2.2.2 Year 2019 Plus Project Traffic Conditions

Review of column (2) of *Table 14-5* indicates that two (2) of the four (4) freeway ramps are forecast to continue to operate at an unacceptable level of service in the Year 2019 with project traffic during the AM and/or PM peak hours, when compared to the LOS standards defined in this report. The remaining two (2) freeway ramps (i.e. key freeway ramps #1 and #4) are forecast to operate at an acceptable LOS D or better in the Year 2019 with project traffic during the AM and PM peak hours. The Project's contribution to the freeway system can be considered significantly impacted at two (2) of the four ramp junctions under this traffic scenario.

Appendix J contains the Freeway Merge/Diverge Ramp Junction Analysis calculation worksheets.

14.2.3 Freeway Ramp Junction Traffic Improvements

A review of the level of service calculations summarized in *Tables 14-4* through *14-5* indicates that the development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact two (2) of the four (4) freeway ramp junctions assessed in the report (i.e. key freeway ramps #2 and #3). However, the SR-22 Freeway is controlled exclusively by the State and there is no mechanism by which the lead agency (City of Long Beach) can construct or guarantee the construction of any improvements to these ramp junctions. Therefore, the proposed Project's incremental impacts on freeway ramp junctions assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative impacts to below significance thresholds or achieve acceptable service level goals.

TABLE 14-4
EXISTING PLUS PROJECT PEAK HOUR MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY

Freeway Merge or Diverge Segment	Analysis Type	Time Period	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions				(3) Significant Impact
			Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Yes/No
1. SR-22 eastbound Off-Ramp to Studebaker Road	Diverge Analysis	AM	3,222	74	32.9	D	3,222	74	32.9	D	No
		PM	2,854	90	29.5	D	2,854	90	29.5	D	No
2. SR-22 eastbound On-Ramp from Studebaker Road	Merge Analysis	AM	3,148	1,061	35.8	E	3,148	1,071	35.9	E	Yes
		PM	2,764	1,180	33.6	D	2,764	1,207	33.8	D	No
3. SR-22 westbound Off-Ramp to Studebaker Road	Diverge Analysis	AM	3,193	764	30.3	D	3,206	777	30.4	D	No
		PM	4,041	1,481	38.0	E	4,073	1,513	38.3	E	Yes
4. SR-22 westbound On-Ramp from Studebaker Road	Merge Analysis	AM	2,429	83	9.2	A	2,429	83	9.2	A	No
		PM	2,560	37	9.5	A	2,560	37	9.5	A	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

TABLE 14-5
YEAR 2019 CUMULATIVE PLUS PROJECT PEAK HOUR MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY

Freeway Merge or Diverge Segment	Analysis Type	Time Period	(1) Year 2019 Cumulative Traffic Conditions				(2) Year 2019 Cumulative Plus Project Traffic Conditions				(3) Significant Impact
			Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Yes/No
1. SR-22 eastbound Off-Ramp <i>to</i> Studebaker Road	Diverge Analysis	AM	3,323	80	33.8	D	3,323	80	33.8	D	No
		PM	2,941	94	30.3	D	2,941	94	30.3	D	No
2. SR-22 eastbound On-Ramp <i>from</i> Studebaker Road	Merge Analysis	AM	3,243	1,127	37.1	E	3,243	1,137	37.2	E	Yes
		PM	2,847	1,281	35.1	E	2,847	1,308	35.3	E	Yes
3. SR-22 westbound Off-Ramp <i>to</i> Studebaker Road	Diverge Analysis	AM	3,354	851	31.8	D	3,367	864	31.9	D	No
		PM	4,202	1,561	39.5	E	4,234	1,593	39.8	E	Yes
4. SR-22 westbound On-Ramp <i>from</i> Studebaker Road	Merge Analysis	AM	2,503	85	9.6	A	2,503	85	9.6	A	No
		PM	2,641	38	9.9	A	2,641	38	9.9	A	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

15.0 CONSTRUCTION TRAFFIC IMPACTS

This section of the report summarizes the potential traffic impacts due to construction activities at the project site. The construction activities associated with the proposed Project include 1) demolition, 2) site grading/excavation, 3) building foundation/framing/construction and 4) paving/concrete/landscaping. The following section describes the potential construction related trips associated with each construction activity and provides an assessment as to whether or not the forecast construction trips will have an impact on the existing street system.

15.1 Construction Traffic Trip Generation

In order to forecast the potential construction related trips associated with the construction activities at the project site, the following assumptions, as provided by Eyestone Environmental, have been utilized for the four aforementioned construction components.

Demolition

- Demolition of 237,638 SF and 400 parking spaces.
- A five-day work week (Monday through Friday) and eight-hour workday was assumed.
- The demolition construction phase is anticipated to last approximately 45 days.
- Maximum of 25 delivery/haul trucks per day (i.e. 50 total daily truck trips).
- A total of 30 workers will be on the site.

Site Grading/Excavation

- 1,545 cubic yards of soil to be imported during this construction phase.
- A five-day work week (Monday through Friday) and eight-hour workday was assumed.
- The site grading/excavation construction phase is anticipated to last approximately 88 days.
- Maximum of 20 delivery/haul trucks per day (i.e. 40 total daily truck trips).
- A total of 20 workers will be on the site.

Building Foundation/Framing/Construction

- Maximum of 50 delivery/concrete/haul trucks per day (i.e. 100 total daily truck trips).
- A five-day work week (Monday through Friday) and eight-hour workday was assumed.
- The building foundation/framing/construction phase is anticipated to last approximately 228 days.
- A total of 175 workers will be on the site.

Paving/Concrete/Landscape

- Maximum of 10 delivery/haul trucks per day (i.e. 20 total daily truck trips).
- A five-day work week (Monday through Friday) and eight-hour workday was assumed.
- The paving/concrete/landscaping construction phase is anticipated to last approximately 120 days.
- A total of 30 workers will be on the site.

In addition to the aforementioned assumptions for each construction component, the following assumptions were utilized for truck trips and employee trips.

- Each truckload requires an inbound trip and an outbound trip.
- The daily number of truck trips was averaged over the eight-hour workday to obtain the number of peak hour truck trips (50% entering and 50% exiting).
- All truck trips were converted to passenger car equivalents (P.C.E.'s) using a P.C.E. factor of 3.0.
- Each worker would make 2 trips per day (one during the AM peak hour and one during the PM peak hour).

Using the aforementioned assumptions, *Table 15-1* provides a summary of the forecast construction peak hour and daily traffic volumes for each of the four construction components. Review of the first row of *Table 15-1* shows that the demolition construction component is expected to generate 210 daily trips with 51 trips produced during the AM peak hour and 51 trips produced during the PM peak hour. Review of the second row of *Table 15-1* shows that the site grading/excavation construction component is expected to generate 160 daily trips with 35 trips produced during the AM peak hour and 35 trips produced during the PM peak hour. Review of the third row of *Table 15-1* shows that the building foundation/framing/construction component is expected to generate 650 daily trips with 214 trips produced during the AM peak hour and 214 trips produced during the PM peak hour. Review of the last row of *Table 15-1* shows that the paving/concrete/landscaping construction component is expected to generate 120 daily trips with 39 trips produced during the AM peak hour and 39 trips produced during the PM peak hour.

15.2 Construction Traffic Analysis

Given that the building foundation/framing/construction component will generate the greatest amount of construction-related traffic; this construction traffic assessment focuses to the potential impacts associated with the building foundation/framing/construction component.

15.2.1 Construction Traffic Distribution Pattern

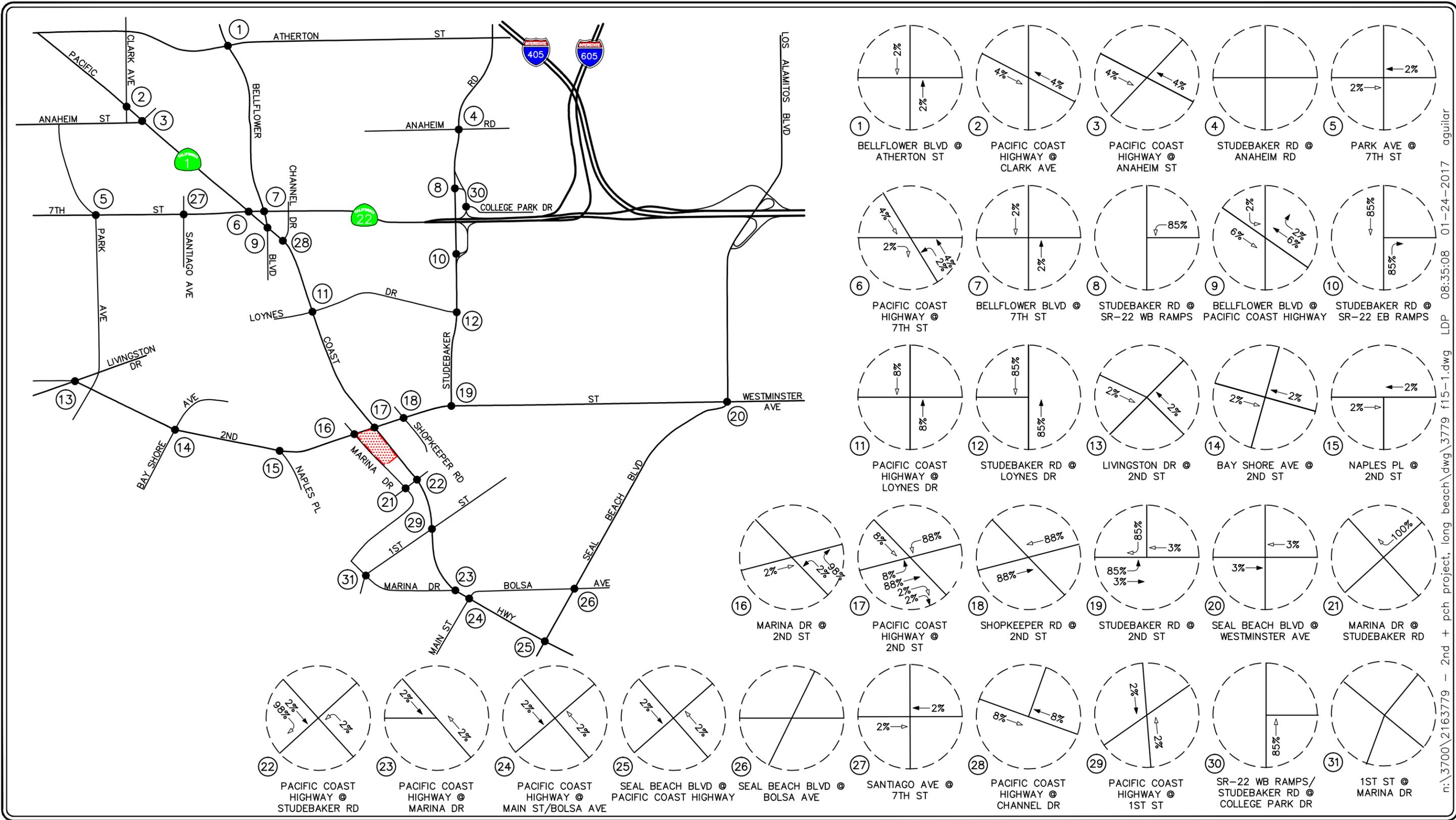
Based on information provided by the project applicant, regional access to/from the project site for construction trucks associated with hauls/deliveries were assumed to be provided via the SR-22 Freeway. Construction worker traffic is anticipated to utilize both regional and local roadways to travel to/from the project site.

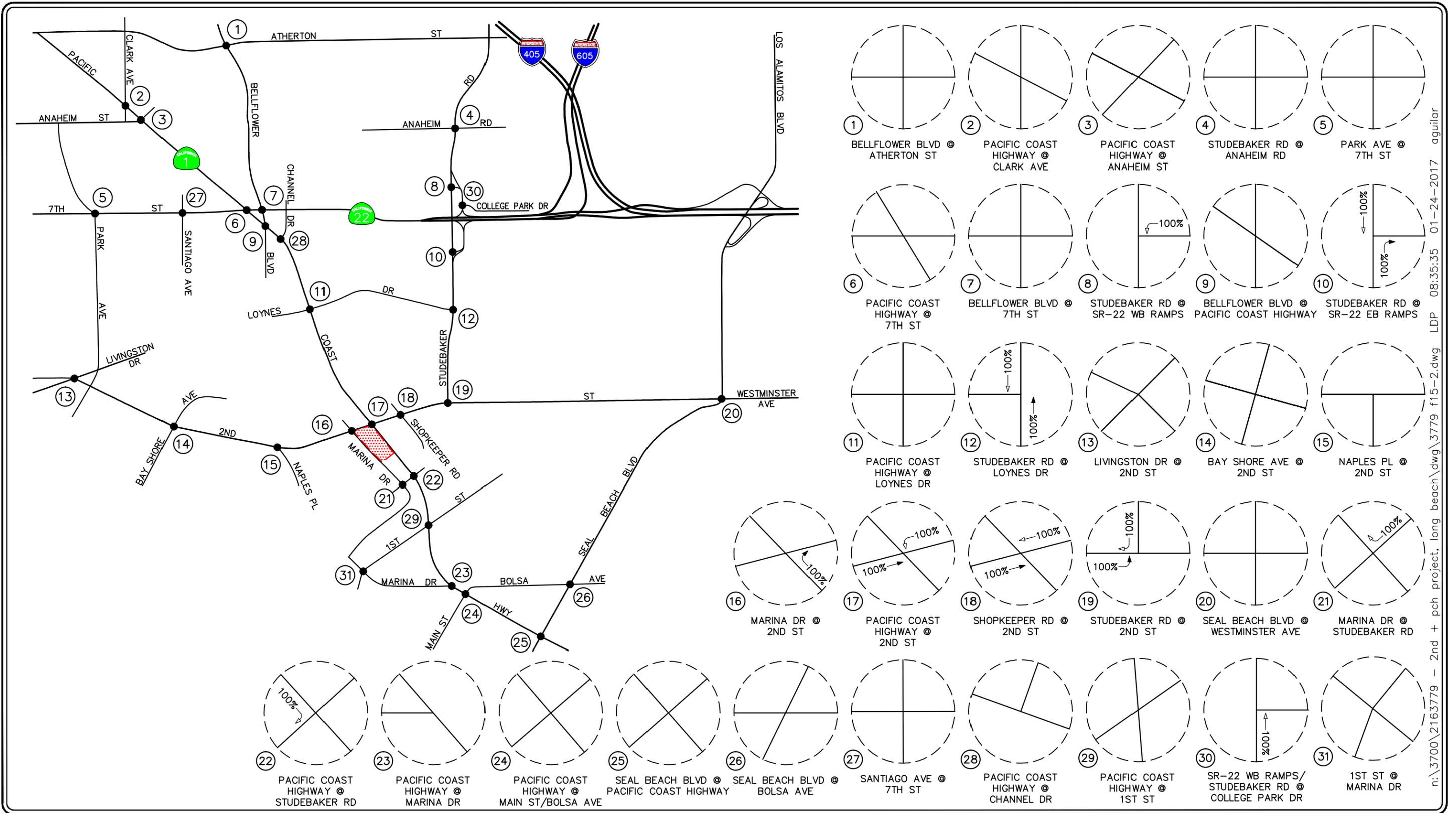
Figures 15-1 and *15-2* graphically illustrate the traffic distribution patterns for the construction workers and trucks associated with the building foundation/framing/construction component, respectively. It should be noted that it is assumed that all construction workers/construction trucks would access the project site via Marina Drive.

TABLE 15-1
PROJECT CONSTRUCTION-RELATED TRAFFIC GENERATION

Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Demolition Generation Forecast:</u>							
• Construction Truck Traffic (25 Trucks)	50	4	3	7	3	4	7
Passenger Car Equivalent Factor ⁴³	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
Subtotal	150	12	9	21	9	12	21
• Employees (30 Workers)	<u>60</u>	<u>30</u>	<u>0</u>	<u>30</u>	<u>0</u>	<u>30</u>	<u>30</u>
Total Demolition Construction Related Traffic Trip Generation Potential	210	42	9	51	9	42	51
<u>Site Grading/Excavation Generation Forecast:</u>							
• Construction Truck Traffic (20 Trucks)	40	3	2	5	2	3	5
Passenger Car Equivalent Factor ⁴³	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
Subtotal	120	9	6	15	6	9	15
• Employees (20 Workers)	<u>40</u>	<u>20</u>	<u>0</u>	<u>20</u>	<u>0</u>	<u>20</u>	<u>20</u>
Total Site Grading/Excavation Construction Related Traffic Trip Generation Potential	160	29	6	35	6	29	35
<u>Building Foundation/Framing/Construction Generation Forecast:</u>							
• Construction Truck Traffic (50 Trucks)	100	7	6	13	6	7	13
Passenger Car Equivalent Factor ⁴³	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
Subtotal	300	21	18	39	18	21	39
• Employees (175 Workers)	<u>350</u>	<u>175</u>	<u>0</u>	<u>175</u>	<u>0</u>	<u>175</u>	<u>175</u>
Total Building Foundation/Framing Construction Related Traffic Trip Generation Potential	650	196	18	214	18	196	214
<u>Paving/Concrete/Landscaping Generation Forecast:</u>							
• Construction Truck Traffic (10 Trucks)	20	2	1	3	1	2	3
Passenger Car Equivalent Factor ⁴³	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
Subtotal	60	6	3	9	3	6	9
• Employees (30 Workers)	<u>60</u>	<u>30</u>	<u>0</u>	<u>30</u>	<u>0</u>	<u>30</u>	<u>30</u>
Total Paving/Concrete/Landscaping Construction Related Traffic Trip Generation Potential	120	36	3	39	3	36	39

⁴³ A passenger car equivalent factor of 3.0 was applied to the truck trips to convert them into passenger car trips.





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15.2.2 Existing Plus Construction Traffic Level of Service Results

Table 15-2 summarizes the results of the existing plus construction traffic level of service analysis at the thirty-one (31) key study intersections. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 15-2* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-5*). The second column (2) lists existing plus construction traffic conditions, shows the increase in ICU value or Delay value due to the added peak hour construction trips and indicates whether or not the key study intersection will be temporarily impacted by construction traffic based on the significant impact criteria defined in this report.

Review of *Table 15-2* shows that six of the thirty-one (31) key study intersections will be temporarily impacted during the building foundation/framing/construction phase of the proposed Project. The six locations consist of Studebaker Road/SR-22 EB Ramps, Pacific Coast Highway/2nd Street, Shopkeeper Road/2nd Street, Studebaker Road/2nd Street, Pacific Coast Highway/Marina Drive and SR-22 WB Ramps-Studebaker Road/College Park Drive. Although the impacts to the aforementioned six intersections are temporary/short-term and unavoidable, it is recommended that the proposed Project implements a Construction Management Plan during project construction to help minimize traffic impacts upon the local circulation system in the area.

Appendix K presents the AM peak hour and PM peak hour construction traffic ICU/LOS and HCM/LOS calculations for the building foundation/framing/construction component.

15.3 Construction Management Plan

To ensure impacts to the surrounding street system are kept a minimum, it is recommended that a Construction Management Plan for the proposed Project be developed. The Construction Management Plan should be developed in coordination with the City of Long Beach and at a minimum, address the following:

- Traffic control for any street closure, detour, or other disruption to traffic circulation.
- Identify the routes that construction vehicles will utilize for the delivery of construction materials (i.e. lumber, tiles, piping, windows, etc.), to access the site, traffic controls and detours, and proposed construction phasing plan for the project.
- Specify the hours during which transport activities can occur and methods to mitigate construction-related impacts to adjacent streets.
- Require the Applicant to keep all haul routes clean and free of debris including but not limited to gravel and dirt as a result of its operations. The Applicant shall clean adjacent streets, as directed by the City Engineer (or representative of the City Engineer), of any material which may have been spilled, tracked, or blown onto adjacent streets or areas.
- Hauling or transport of oversize loads will be allowed between the hours of 9:00 AM and 3:00 PM only, Monday through Friday, unless approved otherwise by the City Engineer. No hauling or transport will be allowed during nighttime hours, weekends or Federal holidays.
- Haul trucks entering or exiting public streets shall at all times yield to public traffic.

- Construction-related parking and staging of vehicles shall occur on-site to the extent possible, but may occur on nearby public parking lots, as approved by the City Engineer.
- This Construction Management Plan shall meet standards established in the current *California Manual on Uniform Traffic Control Device (MUTCD)* as well as City of Long Beach requirements.

TABLE 15-2
EXISTING PLUS CONSTRUCTION TRAFFIC PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Construction Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
1. Bellflower Boulevard at Atherton Street	AM	0.795	C	0.795	C	0.000	No
	PM	0.851	D	0.851	D	0.000	No
2. Pacific Coast Highway at Clark Avenue	AM	0.854	D	0.854	D	0.000	No
	PM	0.818	D	0.820	D	0.002	No
3. Pacific Coast Highway at Anaheim Street	AM	0.763	C	0.765	C	0.002	No
	PM	0.845	D	0.845	D	0.000	No
4. Studebaker Road at Anaheim Road	AM	0.777	C	0.777	C	0.000	No
	PM	0.706	C	0.706	C	0.000	No
5. Park Avenue at 7th Street	AM	0.953	E	0.954	E	0.001	No
	PM	0.883	D	0.883	D	0.000	No
6. Pacific Coast Highway at 7th Street	AM	0.979	E	0.980	E	0.001	No
	PM	0.980	E	0.981	E	0.001	No
7. Bellflower Boulevard at 7th Street	AM	0.917	E	0.917	E	0.000	No
	PM	0.847	D	0.848	D	0.001	No
8. Studebaker Road at SR-22 Westbound Ramps	AM	0.639	B	0.698	B	0.059	No
	PM	0.908	E	0.914	E	0.006	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

TABLE 15-2 (CONTINUED)
EXISTING PLUS CONSTRUCTION TRAFFIC PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Construction Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
9. Bellflower Boulevard at Pacific Coast Highway	AM	0.662	B	0.664	B	0.002	No
	PM	0.668	B	0.668	B	0.000	No
10. Studebaker Road at SR-22 Eastbound Ramps	AM	0.852	D	0.864	D	0.012	No
	PM	0.931	E	1.037	F	0.106	Yes
11. Pacific Coast Highway at Loynes Drive	AM	0.677	B	0.677	B	0.000	No
	PM	0.809	D	0.809	D	0.000	No
12. Studebaker Road at Loynes Drive	AM	0.675	B	0.697	B	0.022	No
	PM	0.791	C	0.831	D	0.040	No
13. Livingston Drive at 2nd Street	AM	0.624	B	0.626	B	0.002	No
	PM	0.583	A	0.584	A	0.001	No
14. Bay Shore Avenue at 2nd Street	AM	0.847	D	0.848	D	0.001	No
	PM	1.009	F	1.009	F	0.000	No
15. Naples Plaza at 2nd Street	AM	0.699	B	0.700	B	0.001	No
	PM	0.746	C	0.746	C	0.000	No
16. Marina Drive at 2nd Street	AM	0.664	B	0.665	B	0.001	No
	PM	0.792	C	0.793	C	0.001	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

TABLE 15-2 (CONTINUED)
EXISTING PLUS CONSTRUCTION TRAFFIC PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Construction Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
17. Pacific Coast Highway at 2nd Street	AM	0.933	E	0.997	E	0.064	Yes
	PM	0.876	D	0.918	E	0.042	Yes
18. Shopkeeper Road at 2nd Street	AM	0.648	B	0.652	B	0.004	No
	PM	0.881	D	0.918	E	0.037	Yes
19. Studebaker Road at 2nd Street	AM	0.857	D	0.864	D	0.007	No
	PM	0.947	E	1.006	F	0.059	Yes
20. Seal Beach Boulevard at Westminster Avenue	AM	0.936	E	0.938	E	0.002	No
	PM	0.929	E	0.929	E	0.000	No
21. Marina Drive at Studebaker Road	AM	11.9 s/v	B	13.6 s/v	B	1.7 s/v	No
	PM	15.8 s/v	C	16.9 s/v	C	1.1 s/v	No
22. Pacific Coast Highway at Studebaker Rd	AM	0.797	C	0.797	C	0.000	No
	PM	0.840	D	0.842	D	0.002	No
23. Pacific Coast Highway at Marina Drive	AM	36.5 s/v	E	39.1 s/v	E	2.6 s/v	Yes
	PM	19.9 s/v	C	24.9 s/v	C	5.0 s/v	No
24. Pacific Coast Highway at Main/Bolsa Avenue	AM	0.730	C	0.731	C	0.001	No
	PM	0.702	C	0.702	C	0.000	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

TABLE 15-2 (CONTINUED)
EXISTING PLUS CONSTRUCTION TRAFFIC PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Construction Traffic Conditions			
		ICU/ HCM	LOS	ICU/ HCM	LOS	Change in ICU/ HCM	Signif- icant Impact
25. Seal Beach Boulevard at Pacific Coast Highway	AM	0.885	D	0.886	D	0.001	No
	PM	0.811	D	0.811	D	0.000	No
26. Seal Beach Boulevard at Bolsa Avenue	AM	0.548	A	0.548	A	0.000	No
	PM	0.492	A	0.492	A	0.000	No
27. Santiago Avenue at 7th Street	AM	0.674	B	0.675	B	0.001	No
	PM	0.729	C	0.730	C	0.001	No
28. Pacific Coast Highway at Channel Drive	AM	0.518	A	0.518	A	0.000	No
	PM	0.524	A	0.526	A	0.002	No
29. Pacific Coast Highway at 1st Street	AM	0.699	B	0.699	B	0.000	No
	PM	0.758	C	0.759	C	0.001	No
30. SR-22 Westbound Ramps/Studebaker Road at College Park Drive	AM	15.2 s/v	C	15.4 s/v	C	0.2 s/v	No
	PM	26.7 s/v	D	35.9 s/v	E	9.2 s/v	Yes
31. 1st Street at Marina Drive	AM	9.2 s/v	A	9.2 s/v	A	0.0 s/v	No
	PM	11.3 s/v	B	11.3 s/v	B	0.0 s/v	No

Notes:

- **Bold ICU/LOS or Delay/LOS** values indicate adverse service levels based on City of Long Beach or City of Seal Beach LOS standards

16.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- **Project Description** – The proposed project site is a 10.77-acre parcel of land located at 6400 East Pacific Coast Highway in the City of Long Beach, California. The project site is currently occupied primarily by the 248-room Seaport Marina Hotel. Based on information provided by the hotel operator, the existing Seaport Marina Hotel currently has 170 rooms in operation out of a possible 248 rooms.

The proposed development will include the construction of up to 245,000 square feet (SF) of retail/commercial floor area, including 95,000 SF of retail uses, a 55,000 SF grocery store, a 25,000 SF fitness/health club, and 70,000 SF of restaurant uses consisting of 40,000 SF of full service dining, 25,000 SF of high-turnover restaurant/fast-food uses and 5,000 SF of ready to eat/take-out food. The Project would provide a total of 1,150 parking spaces within two main parking structures, including a second-level parking deck above some the single-story uses. The Project is expected to be constructed in one phase over the next two years or so and completed by 2018. However, to provide a conservative assessment, Year 2019 has been utilized to assess the Project's potential traffic impacts at full occupancy of the retail center within an opening year traffic setting.

Access to the proposed Project will be provided via two driveways located along Pacific Coast Highway (referred to as Driveway No. 1 and No. 2), via three driveways located along Marina Drive (referred to as Driveway No. 3, No. 4 and No. 5) and via one driveway located along 2nd Street (referred to as Driveway No. 6). The following describes the access assumptions for each project driveway.

Pacific Coast Highway:

- Driveway No. 1: Left-turn in/right-turn in and right-turn out driveway.
- Driveway No. 2: Full access signalized intersection, to be located opposite an existing driveway that now serves the Long Beach Marketplace.

Marina Drive:

- Driveway No. 3: Right-turn in and right-turn out driveway.
- Driveway No. 4: Right-turn in and right-turn out driveway.
- Driveway No. 5: Right-turn in and right-turn out driveway.

2nd Street:

- Driveway No. 6: Right-turn in and right-turn out driveway.

- **Study Scope** – The following thirty-one (31) intersections were selected for detailed peak hour level of service analyses under Existing Traffic Conditions, Existing Plus Project Traffic Conditions, Year 2019 Cumulative Traffic Conditions and Year 2019 Cumulative plus Project Traffic Conditions:

1. Bellflower Boulevard at Atherton Street (LB)
2. Pacific Coast Highway at Clark Avenue (LB)
3. Pacific Coast Highway at Anaheim Street (LB)
4. Studebaker Road at Anaheim Road (LB)
5. Park Avenue at 7th Street (LB)
6. Pacific Coast Highway at 7th Street (LB)⁴⁴
7. Bellflower Boulevard at 7th Street (LB)
8. Studebaker Road at SR-22 WB Ramps (LB)
9. Bellflower Blvd at Pacific Coast Highway (LB)
10. Studebaker Road at SR-22 EB Ramps (LB)
11. Pacific Coast Highway at Loynes Drive (LB)
12. Studebaker Road at Loynes Drive (LB)
13. Livingston Drive at 2nd Street (LB)
14. Bay Shore Avenue at 2nd Street (LB)
15. Naples Plaza at 2nd Street (LB)
16. Marina Drive at 2nd Street (LB)
17. Pacific Coast Highway at 2nd Street (LB)⁴⁴
18. Shopkeeper Road at 2nd Street (LB)
19. Studebaker Road at 2nd Street (LB)
20. Seal Beach Blvd at Westminster Avenue (SB)
21. Marina Drive at Studebaker Road (LB)
22. Pacific Coast Highway at Studebaker Road (LB)
23. Pacific Coast Highway at Marina Drive (SB)
24. Pacific Coast Hwy at Main St/Bolsa Ave (SB)
25. Seal Beach Blvd at Pacific Coast Highway (SB)
26. Seal Beach Boulevard at Bolsa Avenue (SB)
27. Santiago Avenue at 7th Street (LB)
28. Pacific Coast Highway at Channel Drive (LB)
29. Pacific Coast Highway at 1st Street (SB)
30. SR-22 WB Ramps/Studebaker at College Park Dr (LB)
31. 1st Street at Marina Drive (SB)

- **Existing Traffic Conditions** – Ten (10) of the thirty-one (31) key study intersections currently operate at an unacceptable LOS during the AM and/or PM peak hours. The remaining twenty-one (21) key study intersections currently operate at acceptable LOS D or better during the AM and/or PM peak hours. The intersections operating at an adverse level of service are:

<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>
5. Park Avenue at 7 th Street	0.953	E	---	---
6. Pacific Coast Highway at 7 th Street	0.979	E	0.980	E
7. Bellflower Boulevard at 7 th Street	0.917	E	---	---
8. Studebaker Rd at SR-22 WB Ramps	---	---	0.908	E
10. Studebaker Rd at SR-22 EB Ramps	---	---	0.931	E
14. Bay Shore Avenue at 2 nd Street	---	---	1.009	F
17. Pacific Coast Highway at 2 nd Street	0.933	E	---	---
19. Studebaker Road at 2 nd Street	---	---	0.947	E
20. Seal Beach Blvd at Westminster Ave	0.936	E	0.929	E
23. Pacific Coast Highway at Marina Dr	36.5 s/v	E	---	---

- **Project Trip Generation** – With application of existing trip credits, the proposed Project is forecast to generate a net of 13,666 weekday daily trips, 412 weekday AM peak hour trips (236 inbound, 176 outbound), 792 weekday PM peak hour trips (426 inbound, 366 outbound), 17,611 weekend day (Saturday) daily trips and 1,439 weekend day (Saturday) Midday peak hour trips (770 inbound, 669 outbound).

⁴⁴ Los Angeles County Congestion Management Program (CMP) intersection.

- **Cumulative Projects Trip Generation** – The six (6) cumulative projects are expected to generate a combined total of 6,390 weekday daily trips, 560 weekday AM peak hour trips (263 inbound and 297 outbound), 624 weekday PM peak hour trips (316 inbound and 308 outbound), 11,435 weekend day (Saturday) daily trips and 1,157 weekend day (Saturday) Midday peak hour trips (742 inbound, 415 outbound).
- **Existing Plus Project Traffic Conditions** – The results of the “Existing Plus Project” analysis indicate that the proposed Project will significantly impact eight of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The eight intersections impacted by the proposed Project under existing plus project traffic conditions and the time period in which the impact occurs include:

<u>Key Intersection</u>	<u>Impacted Time Period</u>
8. Studebaker Road at SR-22 WB Ramps	PM
14. Bay Shore Avenue at 2 nd Street	PM
17. Pacific Coast Highway at 2 nd Street	AM / PM
19. Studebaker Road at 2 nd Street	PM
20. Seal Beach Boulevard at Westminster Avenue	PM
23. Pacific Coast Highway at Marina Drive	AM
24. Pacific Coast Highway at Main/Bolsa Avenue	PM
25. Seal Beach Boulevard at Pacific Coast Highway	PM

Please note that although the intersections of Park Avenue/7th Street, Pacific Coast Highway/7th Street, Bellflower Boulevard/7th Street and Studebaker Road/SR-22 EB Ramps are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours with the addition of project traffic, the proposed Project is expected to add less than 0.020 to the ICU value. The remaining nineteen (19) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to existing traffic. Implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street, Studebaker Road/2nd Street and Seal Beach Boulevard/Westminster Avenue offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or F during the AM and/or PM peak hours. The implementation of improvements at the five remaining impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours.

- **Year 2019 Cumulative Plus Project Traffic Conditions** – The results of the “Year 2019 Cumulative Plus Project” traffic analysis indicate that the proposed Project will significantly impact eleven of the thirty-one (31) key study intersections in the Year 2019, when compared to the LOS standards and significant impact criteria specified in this report. The eleven intersections impacted by the proposed Project under Year 2019 plus project traffic conditions and the time period in which the impact occurs include:

<u>Key Intersection</u>	<u>Impacted Time Period</u>
8. Studebaker Road at SR-22 WB Ramps	PM
12. Studebaker Road at Loynes Drive	PM
14. Bay Shore Avenue at 2 nd Street	PM
17. Pacific Coast Highway at 2 nd Street	AM / PM
19. Studebaker Road at 2 nd Street	AM / PM
20. Seal Beach Blvd at Westminster Avenue	PM
22. Pacific Coast Highway at Studebaker Road	PM
23. Pacific Coast Highway at Marina Drive	AM
24. Pacific Coast Highway at Main/Bolsa Avenue	PM
25. Seal Beach Blvd at Pacific Coast Highway	PM
29. Pacific Coast Highway at 1 st Street	PM

Please note that although the intersections of Bellflower Boulevard/Atherton Street, Park Avenue/7th Street, Pacific Coast Highway/7th Street, Bellflower Boulevard/7th Street, Studebaker Road/SR-22 EB Ramps and Shopkeeper Road/2nd Street are forecast to operate at unacceptable LOS E and/or LOS F during the AM and/or PM peak hours with the addition of project traffic, the proposed Project is expected to add less than 0.020 to the ICU value. The remaining fourteen (14) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2019. Implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street, Pacific Coast Highway/2nd Street, Studebaker Road/2nd Street and Seal Beach Boulevard/Westminster Avenue offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or F during the AM and/or PM peak hours. The implementation of improvements at the seven remaining impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours.

- ***Existing Plus Project Saturday Traffic Conditions*** – The results of the “Existing Plus Project Saturday” analysis indicate that the proposed Project will significantly impact three of the nine (9) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining six (6) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to existing Saturday traffic. The three intersections impacted by the proposed Project under existing plus project Saturday traffic conditions consist of the following:

<u>Key Intersection</u>	<u>Midday Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>
14. Bay Shore Avenue at 2 nd Street	1.029	F
17. Pacific Coast Highway at 2 nd Street	1.054	F
22. Pacific Coast Highway at Studebaker Road	0.927	E

Implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street offsets the impact of project traffic; however this location is still forecast to operate at unacceptable LOS E during the Saturday Midday peak hour. The implementation of improvements at the two remaining impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the Saturday Midday peak hour.

- ***Year 2019 Cumulative Plus Project Saturday Traffic Conditions*** – The results of the “Year 2019 Cumulative Plus Project Saturday” traffic analysis indicate that the proposed Project will significantly impact three of the nine (9) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining six (6) key study intersections are forecast to continue to operate at an acceptable LOS on a Saturday with the addition of project generated traffic in the Year 2019. The three intersections impacted by the proposed Project under Year 2019 plus project Saturday traffic conditions consist of the following:

<u>Key Intersection</u>	<u>Midday Peak Hour</u>	
	<u>ICU/HCM</u>	<u>LOS</u>
14. Bay Shore Avenue at 2 nd Street	1.067	F
17. Pacific Coast Highway at 2 nd Street	1.097	F
22. Pacific Coast Highway at Studebaker Road	0.973	E

Implementation of improvements at the impacted key study intersections of Bay Shore Avenue/2nd Street and Pacific Coast Highway/2nd Street offsets the impact of project traffic; however these locations are still forecast to operate at unacceptable LOS E and/or LOS F during the Saturday Midday peak hour. The implementation of improvements at the remaining impacted key study intersection completely offsets the impact of project traffic and the key study intersection is forecast to operate at an acceptable LOS during the Saturday Midday peak hour.

- ***State of California Intersection Analysis (Existing Plus Project)*** – Three of the sixteen state-controlled study intersections are forecast to operate at an unacceptable service level during the AM and/or PM peak hour with the addition of project traffic to existing traffic. The intersections of Pacific Coast Highway/2nd Street, Pacific Coast Highway/Marina Drive and Seal Beach Boulevard/Pacific Coast Highway are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours. The remaining state-controlled key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to existing traffic. Implementation of improvements at the impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours.
- ***State of California Intersection Analysis (Year 2019 Plus Project)*** – Three of the sixteen state-controlled study intersections are forecast to operate at an unacceptable service level during the AM and/or PM peak hours with the addition of project traffic in the Year 2019. The intersections of Pacific Coast Highway/2nd Street, Pacific Coast Highway/Marina Drive and Seal Beach Boulevard/Pacific Coast Highway are forecast to operate at unacceptable LOS E during

the AM and/or PM peak hours. The remaining state-controlled key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2019. Implementation of improvements at the three impacted key study intersections completely offsets the impact of project traffic and the three key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours.

- **Site Access** – All six (6) project driveways are forecast to operate at acceptable LOS D or better during the weekday AM and PM peak hours. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so comfortably, safely, and without undue congestion.
- **Internal Circulation** – The on-site circulation layout of the proposed Project, on an overall basis, appears generally adequate. Since detailed (to scale) site plans are not available for review at this time, it is recommended that prior to finalization of the project site plan, the appropriate turning templates (ASSHTO SU-30, WB-50 and fire trucks) be utilized to confirm that all vehicles can properly access and circulate through the site, and that all internal drive aisle widths, project driveway widths, and parking stall widths, especially within the parking garages, satisfy the City’s minimum requirements.
- **Project Specific Improvements** – The following project design features that will be constructed by the proposed Project are recommended to ensure that adequate ingress and egress to the project site is provided:
 - ❑ **Pacific Coast Highway Project Frontage:** Provide an acceleration/deceleration lane on Pacific Coast Highway along the project frontage. The deceleration lane will function as a southbound right-turn lane at Project Driveway No. 1 and at Project Driveway No. 2. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.
 - ❑ **Pacific Coast Highway at Project Driveway No. 1:** Construct the project driveway and provide one inbound lane and one outbound lane (i.e. one eastbound right-turn lane). It is recommended that the median on Pacific Coast Highway be modified to prohibit eastbound (outbound) left-turns and restriped to provide one 100-foot northbound left-turn lane with a 90-foot transition. Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Pacific Coast Highway. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.
 - ❑ **Pacific Coast Highway at Project Driveway No. 2:** Construct the project driveway and a new driveway that will serve the Long Beach Marketplace on the east side of Pacific Coast Highway. The project driveway will provide one inbound lane, dual 150-foot eastbound left-turn lanes and a 150-foot eastbound shared through/right-turn lane. The Long Beach Marketplace driveway will provide two inbound lanes, one 90-foot westbound left-turn lane and one 90-foot westbound shared through/right-turn lane. The median on Pacific Coast Highway will be modified to provide appropriate left-turn lane pockets and transitions in both the northbound and southbound directions. Install an eight-phase traffic signal. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans.

- **Marina Drive at Project Driveway No. 3:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.
- **Marina Drive at Project Driveway No. 4:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.
- **Marina Drive at Project Driveway No. 5:** Maintain existing driveway to provide one inbound lane and one outbound lane (i.e. one westbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on Marina Drive. The installation of these improvements is subject to the approval of the City of Long Beach.
- **2nd Street at Project Driveway No. 6:** Construct the project driveway and provide one inbound lane and one outbound lane (i.e. one northbound right-turn lane). Install a “STOP” sign, “STOP” pavement legend and stop bar at the project driveway on 2nd Street. The installation of these improvements is subject to the approval of the City of Long Beach.
- **Planned Improvements** – The following improvements are planned by the City of Long Beach and consist of the following:
 - **No. 1 – Bellflower Boulevard at Atherton Street:** Remove the third northbound through lane on Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach.
 - **No. 7 – Bellflower Boulevard at 7th Street:** Remove the third northbound through lane on Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach and/or Caltrans.
 - **No. 9 – Bellflower Boulevard at Pacific Coast Highway:** Remove one southbound through lane along Bellflower Boulevard and install a bike lane. Modify the existing traffic signal accordingly. These improvements are planned by the City of Long Beach as part of the Bellflower Boulevard Bicycle System Gap Closure Project. The installation of these planned improvements is subject to the approval of the City of Long Beach and/or Caltrans.

The following improvements are part of the AES Battery Energy Storage System Cumulative Project located at 690 Studebaker Road and are necessary to provide adequate ingress and egress to the site.

- **No. 12 – Studebaker Road at Loynes Drive:** Provide an exclusive southbound left-turn lane, an exclusive westbound left-turn lane and a westbound shared through/right-turn lane. Modify the existing traffic signal accordingly. The installation of these planned improvements is subject to the approval of the City of Long Beach.

- **Recommended Improvements (Existing Plus Project)** – The results of the intersection capacity analysis presented previously in *Tables 8-1* and *9-1* shows that the proposed Project will significantly impact nine of the thirty-one (31) key study intersections under the “Existing Plus Project” traffic scenario. The following are improvements recommended to mitigate the weekday and Saturday existing plus project traffic impacts:
 - **No. 8 – Studebaker Road at SR-22 WB Ramps:** Widen and restripe the westbound approach to provide a third westbound left-turn lane. Widen and restripe the southbound approach of Studebaker Road to provide a third southbound through lane. These improvements would require right-of-way acquisition at the on/off ramp and along the west side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered ***significant and unavoidable*** and a statement of overriding considerations will be required for this location.

It should be noted that this location is only significantly impacted by the proposed Project under the City of Long Beach ICU methodology. This location does not have a significant impact based on the Caltrans HCM methodology.

- **No. 14 – Bay Shore Avenue at 2nd Street:** Widen and restripe the northbound approach of Bay Shore Avenue to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition at the southeast corner of the intersection and may affect the existing sidewalk and/or existing public restroom building. This improvement would also require the elimination of short-term parking on Bay Shore Avenue adjacent to the Bay Shore Neighborhood Library. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection**. As such, the impact at this location is considered ***significant and unavoidable*** and a statement of overriding considerations will be required for this location.

- **No. 17 – Pacific Coast Highway at 2nd Street:** Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 19 – Studebaker Road at 2nd Street:** Widen and restripe the eastbound approach of 2nd Street to provide a third eastbound left-turn lane. Widen and restripe Studebaker Road to provide a third northbound receiving lane. These improvements would require right-of-way acquisition along the south side of 2nd Street and on the east side of Studebaker Road within the existing wetlands. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the south side of 2nd Street and on the northeast corner of the intersection.** As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 20 – Seal Beach Boulevard at Westminster Avenue:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach, who is the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 22 – Pacific Coast Highway at Studebaker Road:** Convert the exclusive southbound right-turn lane on Pacific Coast Highway to a shared through/right-turn lane. Widen and restripe Pacific Coast Highway to provide a third southbound receiving lane. The third southbound receiving lane would require right-of-way acquisition from property owners on the southwest corner of the intersection in order to maintain the existing bike lane. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southwest corner of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 23 – Pacific Coast Highway at Marina Drive:** Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 24 – Pacific Coast Highway at Main Street/Bolsa Avenue:** Widen and restripe the northbound approach of Pacific Coast Highway to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners on the northeast corner and the southeast corner of the intersection. This improvement may also affect the existing building located on the northeast corner of the intersection and the existing parking spaces within Seal Beach Center located on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast and southeast corners of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed

Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection** and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

- **Recommended Improvements (Year 2019 Plus Project)** – The results of the intersection capacity analysis presented previously in *Tables 8-2 and 9-2* shows that the proposed Project will significantly impact eleven of the thirty-one (31) key study intersections under the “Year 2019 Plus Project” traffic scenario. The following are improvements recommended to mitigate the weekday and Saturday Year 2019 plus project traffic impacts:

- **No. 8 – Studebaker Road at SR-22 WB Ramps:** Widen and restripe the westbound approach to provide a third westbound left-turn lane. Widen and restripe the southbound approach of Studebaker Road to provide a third southbound through lane. These improvements would require right-of-way acquisition at the on/off ramp and along the west side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.

It should be noted that this location is only significantly impacted by the proposed Project under the City of Long Beach ICU methodology. This location does not have a significant impact based on the Caltrans HCM methodology.

- **No. 12 – Studebaker Road at Loynes Drive:** Widen and restripe the northbound approach of Studebaker Road to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners along the east side of Studebaker Road. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the east side of Studebaker Road**. As such, the impact at this location is considered **significant and unavoidable** and a statement of overriding considerations will be required for this location.
- **No. 14 – Bay Shore Avenue at 2nd Street:** Widen and restripe the northbound approach of Bay Shore Avenue to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition at the southeast corner of the intersection and may affect the existing sidewalk and/or existing public restroom building. This improvement would also require the elimination of short-term parking on Bay Shore Avenue adjacent to the Bay Shore Neighborhood Library. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It

should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection**. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 17 – Pacific Coast Highway at 2nd Street:** Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 19 – Studebaker Road at 2nd Street:** Widen and restripe the eastbound approach of 2nd Street to provide a third eastbound left-turn lane. Widen and restripe Studebaker Road to provide a third northbound receiving lane. These improvements would require right-of-way acquisition along the south side of 2nd Street and on the east side of Studebaker Road within the existing wetlands. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the south side of 2nd Street and on the northeast corner of the intersection**. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 20 – Seal Beach Boulevard at Westminster Avenue:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection and** approval from the City of Seal Beach, who is the owner/operator of this key study intersection. As such, the impact at this

location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 22 – Pacific Coast Highway at Studebaker Road:** Convert the exclusive southbound right-turn lane on Pacific Coast Highway to a shared through/right-turn lane. Widen and restripe Pacific Coast Highway to provide a third southbound receiving lane. The third southbound receiving lane would require right-of-way acquisition from property owners on the southwest corner of the intersection in order to maintain the existing bike lane. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southwest corner of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 23 – Pacific Coast Highway at Marina Drive:** Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 24 – Pacific Coast Highway at Main Street/Bolsa Avenue:** Widen and restripe the northbound approach of Pacific Coast Highway to provide a third northbound through lane. This improvement would require right-of-way acquisition from property owners on the northeast corner and the southeast corner of the intersection. This improvement may also affect the existing building located on the northeast corner of the intersection and the existing parking spaces within Seal Beach Center located on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast and southeast corners of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from**

property owners on the southeast corner of the intersection and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 29 – Pacific Coast Highway at 1st Street:** Widen and restripe the southbound approach of Pacific Coast Highway to provide an exclusive southbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the northwest corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northwest corner of the intersection and** approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **Recommended Existing Plus Project Improvements (Caltrans Methodology)** – The following improvements listed below have been identified to mitigate the existing plus project traffic impacts (Caltrans methodology) at the following intersections:
 - **No. 17 – Pacific Coast Highway at 2nd Street:** Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
 - **No. 23 – Pacific Coast Highway at Marina Drive:** Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at

this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection** and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- **Recommended Year 2019 Plus Project Improvements (Caltrans Methodology)** – The following improvements listed below have been identified to mitigate the Year 2019 plus project traffic impacts (Caltrans methodology) at the following intersections:
 - **No. 17 – Pacific Coast Highway at 2nd Street:** Widen and restripe the northbound approach of Pacific Coast Highway to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the eastbound approach of 2nd Street to provide a fourth eastbound through lane. This improvement would require right-of-way acquisition from property owners on the southwest corner and the southeast corner of the intersection and may affect the existing Mobil gas canopy. Widen and restripe the westbound approach of 2nd Street to provide a third westbound left-turn lane. This improvement would require right-of-way acquisition from property owners on the northeast corner of the intersection and may affect the existing In-N-Out burger drive-through lane. Modify the existing traffic signal as necessary and install an eastbound right-turn overlap phase. The installation of these improvements is subject to the approval of the City of Long Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the northeast, southwest and southeast corners of the intersection as well as** approval from Caltrans, who is also the owner/operator of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
 - **No. 23 – Pacific Coast Highway at Marina Drive:** *Same as those identified in Section 12.5.1.* Install a three-phase traffic signal with protected left-turn phasing in the northbound direction. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.

- **No. 25 – Seal Beach Boulevard at Pacific Coast Highway:** *Same as those identified in Section 12.5.1.* Widen and restripe the northbound approach of Seal Beach Boulevard to provide an exclusive northbound right-turn lane. This improvement would require right-of-way acquisition from property owners on the southeast corner of the intersection. Modify the existing traffic signal as necessary. The installation of these improvements is subject to the approval of the City of Seal Beach and Caltrans. It should be noted that these improvements cannot be guaranteed by the proposed Project or the City of Long Beach as the improvements would require **right-of-way from property owners on the southeast corner of the intersection** and approval from the City of Seal Beach and/or Caltrans, who are the owners/operators of this key study intersection. As such, the impact at this location is considered *significant and unavoidable* and a statement of overriding considerations will be required for this location.
- ***Development Impact Fee and Project Fair Share Contribution*** – Based on a total Project development of 245,000 SF of commercial (retail/restaurant) space, the proposed 2nd + PCH Project can be expected to pay up to \$735,000 in Transportation Improvement Fees. The precise fee, plus any credit for existing development, will be determined by the City upon issuance of project building permits. It should be noted that the project-specific improvements listed in Section 12.1 for Pacific Coast Highway (i.e. Pacific Coast Highway frontage, Project Driveway No. 1 and Project Driveway No. 2) will cost approximately \$1,000,000.00 and will be paid for and constructed by the project applicant
 - ***CMP Compliance Assessment*** – Refer to Section 13.0 for details regarding project compliance with the Los Angeles County Congestion Management Program.
 - ***Caltrans Basic Freeway Analysis*** – The development of the Project in combination with cumulative development and ambient traffic growth is anticipated to cumulatively impact two (2) of the twelve (12) mainline freeway segments assessed in the report (i.e. key freeway segments #1 and #2). However, the SR-22 Freeway is controlled exclusively by the State and there is no mechanism by which the lead agency (City of Long Beach) can construct or guarantee the construction of any improvements to these freeway segments. Therefore, the proposed Project’s incremental impacts on key freeway study segments assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative mainline impacts to below significance thresholds or achieve acceptable service level goals.
 - ***Caltrans Ramp Junction Merge and Diverge Analysis*** – The development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact two (2) of the four (4) freeway ramp junctions assessed in the report (i.e. key freeway ramps #2 and #3). However, the SR-22 Freeway is controlled exclusively by the State and there is no mechanism by which the lead agency (City of Long Beach) can construct or guarantee the construction of any improvements to these ramp junctions. Therefore, the proposed Project’s incremental impacts on freeway ramp junctions assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative impacts to below significance thresholds or achieve acceptable service level goals.

- **Construction Traffic Impacts** – Six of the thirty-one (31) key study intersections will be temporarily impacted during the building foundation/framing/construction phase of the proposed Project. The six locations consist of Studebaker Road/SR-22 EB Ramps, Pacific Coast Highway/2nd Street, Shopkeeper Road/2nd Street, Studebaker Road/2nd Street, Pacific Coast Highway/Marina Drive and SR-22 WB Ramps-Studebaker Road/College Park Drive. Although the impacts to the aforementioned six intersections are temporary/short-term and unavoidable, it is recommended that the proposed Project implements a Construction Management Plan during project construction to help minimize traffic impacts upon the local circulation system in the area.

To ensure impacts to the surrounding street system are kept a minimum, it is recommended that a Construction Management Plan for the proposed Project be developed. The Construction Management Plan should be developed in coordination with the City of Long Beach and at a minimum, address the following:

- Traffic control for any street closure, detour, or other disruption to traffic circulation.
- Identify the routes that construction vehicles will utilize for the delivery of construction materials (i.e. lumber, tiles, piping, windows, etc.), to access the site, traffic controls and detours, and proposed construction phasing plan for the project.
- Specify the hours during which transport activities can occur and methods to mitigate construction-related impacts to adjacent streets.
- Require the Applicant to keep all haul routes clean and free of debris including but not limited to gravel and dirt as a result of its operations. The Applicant shall clean adjacent streets, as directed by the City Engineer (or representative of the City Engineer), of any material which may have been spilled, tracked, or blown onto adjacent streets or areas.
- Hauling or transport of oversize loads will be allowed between the hours of 9:00 AM and 3:00 PM only, Monday through Friday, unless approved otherwise by the City Engineer. No hauling or transport will be allowed during nighttime hours, weekends or Federal holidays.
- Haul trucks entering or exiting public streets shall at all times yield to public traffic.
- Construction-related parking and staging of vehicles shall occur on-site to the extent possible, but may occur on nearby public parking lots, as approved by the City Engineer.
- This Construction Management Plan shall meet standards established in the current *California Manual on Uniform Traffic Control Device (MUTCD)* as well as City of Long Beach requirements.