Appendix D – Focused Traffic Analysis

KUNZMAN ASSOCIATES, INC.

THE BAY THEATER

FOCUSED TRAFFIC ANALYSIS (REVISED)

February 15, 2017

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

THE BAY THEATER

FOCUSED TRAFFIC ANALYSIS (REVISED)

February 15, 2017

Prepared by:

Chris Pylant ■ Carl Ballard, LEED GA ■ William Kunzman, P.E.

KUNZMAN ASSOCIATES, INC.
1111 Town & Country Road, Suite 34 ■ Orange, California 92868
5005 La Mart Drive, Suite 201 ■ Riverside, California 92507
(714) 973-8383 ■ www.traffic-engineer.com

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THE BAY THEATER

FOCUSED TRAFFIC ANALYSIS

This report contains the focused traffic analysis for The Bay Theater project. The project site is located on the east side of Main Street (340 Main Street), approximately 160 feet south of Pacific Coast Highway in the City of Seal Beach. The project site is constructed with a 425 seat theater that is currently vacant. The project proposes to reconfigure the theater, resulting in a maximum of 475 seats.

The traffic impact analysis contains documentation of existing traffic conditions, trips generated by the project, distribution of the project trips to roads outside the project as well as calculation of existing plus project[1] traffic conditions, Opening Year traffic conditions without and with the project, and Buildout traffic conditions without and with the project. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

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[1] The existing plus project conditions has been analyzed to comply with the Sunnyvale West Neighborhood Association v. City of Sunnyvale CEQA court case. This scenario assumes the full development of the proposed project and full absorption of the proposed project trips on the circulation system at the present time.

I. FINDINGS

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

A. Definition of Deficiency and Significant Impact

City of Seal Beach

The following definitions of deficiencies and significant impacts have been developed in accordance with the Orange County Congestion Management Program requirements and the City of Seal Beach General Plan, adopted December 2003.

The definition of an intersection deficiency has been obtained from City of Seal Beach General Plan. The City of Seal Beach requires the maintenance of Level of Service D or better for roadway segments and intersections. Additionally a project impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds: 0.06 for Level of Service A & B, 0.04 for Level of Service C, 0.02 for Level of Service D, or 0.01 for Level of Service E or F.

B. Existing Traffic Conditions

1. The project site is not currently in operation and is not generating significant trips.

2. Based on discussions with the City of Seal Beach staff, the study area includes the following intersections:

   Bolsa Avenue/Silver Shoals Drive (NS) at:
   Chase Driveway/Bolsa Avenue (EW) - #1

   Main Street/Bolsa Avenue (NS) at:
   Pacific Coast Highway (EW) - #2

   Main Street (NS) at:
   Electric Avenue (EW) - #3

3. The study area intersections currently operate within acceptable Levels of Service during the evening peak hour for Existing traffic conditions (see Table 1).

C. Traffic Impacts

1. The project site is constructed with a 425 seat theater that is not currently in operation. The project proposes to reconfigure the theater, resulting in a maximum of 475 seats. An existing parking lot at the northeast corner of the Main Street/Bolsa Avenue and Pacific Coast Highway intersection is proposed to be used as off-site parking. Drop-off access will be provided along Main Street.

2. The peak operational periods for the proposed project are expected to be approximately 7:00 PM to 9:00 PM on weekdays and 8:00 PM to 10:00 PM on weekends. The peak periods are expected to occur outside of the peak hours for adjacent street traffic.

3. The proposed development is projected to generate approximately 855 daily vehicle trips, 2 of which will occur during the morning peak hour and 33 vehicle trips of which will occur during the evening peak hour.

4. The City of Seal Beach staff provided information about other developments in the study area.

5. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Existing Plus Project traffic conditions.

6. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Existing Plus Project Plus Cumulative traffic conditions.

7. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) Without Project traffic conditions.

8. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) With Project traffic conditions.

9. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) With Project Plus Cumulative traffic conditions.

10. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout Without Project traffic conditions.

11. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout With Project traffic conditions.

12. The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout With Project Plus Cumulative traffic conditions.

13. The study area roadway segments currently operate within acceptable Levels of Service during the peak hours for Existing traffic conditions.

14. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions. The addition of project related trips does not result in a significant impact on any study area roadway segments.

15. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project Plus Cumulative traffic conditions.

16. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) Without Project traffic conditions.

17. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) With Project traffic conditions. The addition of project related trips does not result in a significant impact on any study area roadway segments.

18. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) With Project Plus Cumulative traffic conditions.

19. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout Without Project traffic conditions.

20. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout With Project traffic conditions. The segment of Main Street between Electric Avenue and Pacific Coast Highway is projected to operate at Level of Service E. However, the City of Seal Beach has adopted the Main Street Specific Plan which recognizes Main Street as a "combination parking and traffic street" which would never achieve the Level of Service D standard due to its nature as the commercial center of the city.

21. The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout With Project Plus Cumulative traffic conditions.

D. <u>Recommendations</u>

1. As a parking agreement has been secured with the bank property at 801 Pacific Coast Highway, the project will meet the City's parking requirements.

2. The project is expected to have sufficient parking. The availability of pedestrian and transit options will further reduce parking demand.

3. To accommodate two drop-off vehicles arriving simultaneously, it is recommended that space for two vehicles be provided. This can be accomplished by providing two angled parking spaces or 50 linear feet of painted curb space for loading.

4. As is the case for any roadway design, the City of Seal Beach should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

II. ANALYSIS METHODOLOGY

This section discusses the Orange County Congestion Management Program and City of Seal Beach Significant Impact Criteria. The purpose, prescribed methodology, and definition of a significant traffic impact are discussed.

A. County Congestion Management Program

The Congestion Management Program is a result of Proposition 111 which was a statewide initiative approved by the voters in June, 1990. The proposition allowed for a nine cent per gallon State gasoline tax increase over a five year period.

Proposition 111 explicitly stated that the new gas tax revenues were to be used to fix existing traffic problems and was not to be used to promote future development. For a City to get its share of the Proposition 111 gas tax, it has to follow certain procedures specified by the State Legislature. The legislation requires that a traffic impact analysis be prepared for new development. The traffic impact analysis is prepared to monitor and fix traffic problems caused by new development.

The Legislature requires that adjacent jurisdictions use a standard methodology for conducting a traffic impact analysis. To assure that adjacent jurisdictions use a standard methodology in preparing traffic impact analyses, one common procedure is that all Cities within a County, and the County agency itself, adopt and use one standard methodology for conducting traffic impact analyses.

Although each County has developed standards for preparing traffic impact analyses, traffic impact analysis requirements do vary in detail from one County to another, but not in overall intent or concept. The general approach selected by each County for conducting traffic impact analyses has common elements.

The general approach for conducting a traffic impact analysis is that existing weekday peak hour traffic is counted and the percent of roadway capacity currently used is determined. Then the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level which is no worse than before the project traffic was added.

If the project size is below a certain minimum threshold level, then a project does not have to have a traffic impact analysis prepared, once it is shown or agreed that the project is below the minimum threshold. In Orange County a project needs a traffic impact analysis if it generates more than 200 daily trips. If a project is bigger than the minimum threshold size, then a traffic impact analysis is required.

B. Prescribed Methodology for a Traffic Impact Analysis

The traffic impact analysis must include all monitored intersections to which the project adds traffic above a certain minimum amount.

In the City of Seal Beach, the Level of Service standard for intersection and roadway segment operation is Level of Service D.

In the City of Seal Beach, a project impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds: 0.06 for Level of Service A & B, 0.04 for Level of Service C, 0.02 for Level of Service D, or 0.01 for Level of Service E or F.

An intersection mitigation measure shall either fix the deficiency, or reduce the Intersection Capacity Utilization so that it is below the level which occurs without the project.

In the City of Seal Beach, the technique used to calculate Intersection Capacity Utilization for a signalized intersection is as follows. Lane capacity is 1,700 vehicles per lane per hour of green time for through lanes and 1,600 vehicles per hour for turn lanes and shared lanes. A total yellow clearance time of 10 percent is added.

This traffic analysis has been prepared in accordance with the traffic impact analysis requirements except as noted. The traffic impact analysis not only examined the Congestion Management Program system of roads and intersections, but also other roads and intersections.

The project generated traffic was added to intersections, and a full intersection analysis was conducted, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis.

C. Mitigation Measures

If a project is large enough to require that a traffic impact analysis be prepared, and if the project adds traffic to an intersection above a minimum threshold, and if the intersection is operating at above an acceptable level of operation, then the project must mitigate its traffic impact.

Traffic mitigation can be in many forms including adding lanes. Lanes can sometimes be obtained through restriping or elimination of parking, and sometimes require spot roadway widening.

III. PROJECT DESCRIPTION

This section discusses the project's location and proposed development. Figure 1 shows the project location map.

A. Location

The project site is located on the east side of Main Street (340 Main Street), approximately 160 feet south of Pacific Coast Highway in the City of Seal Beach.

B. Proposed Project

The project site is constructed with a 425 seat theater that is not currently in operation. The project proposes to reconfigure the theater, resulting in a maximum of 475 seats. An existing parking lot at the northeast corner of the Main Street/Bolsa Avenue and Pacific Coast Highway intersection is proposed to be used as off-site parking. Drop-off access will be provided along Main Street.

The peak operational period for the proposed project is expected to be approximately 7:00 PM to 9:00 PM on weekdays and 8:00 PM to 10:00 PM on weekends. The peak periods are expected to occur outside of the peak hours for adjacent street traffic.

Figure 1
Project Location Map

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IV. EXISTING TRAFFIC CONDITIONS

The traffic conditions as they exist today are discussed below and illustrated on Figures 2 to 10.

A. Surrounding Street System

Roadways that will be utilized by the development include Main Street, Bolsa Avenue, Silver Shoals Drive, Pacific Coast Highway (SR-1), and Electric Avenue.

Main Street: This roadway is currently two lanes undivided in the study area. This roadway is classified as a Secondary (typically 80 foot right-of-way) on the City of Seal Beach General Plan Circulation Element. It currently carries approximately 3,500 to 6,200 vehicles per day in the study area.

Bolsa Avenue: This roadway is currently two lanes undivided in the study area. This roadway is classified as a Secondary (typically 80 foot right-of-way) on the City of Seal Beach General Plan Circulation Element. It currently carries approximately 5,000 to 5,200 vehicles per day in the study area.

Silver Shoals Drive: This roadway is currently two lanes undivided in the study area. This roadway is not classified on the City of Seal Beach General Plan Circulation Element. It currently carries approximately 900 vehicles per day in the study area.

Pacific Coast Highway (SR-1): This roadway is currently four lanes divided in the study area. This roadway is classified as a Primary (typically 100 foot right-of-way) on the City of Seal Beach General Plan Circulation Element. It currently carries approximately 45,000 vehicles per day in the study area.

Electric Avenue: This roadway is currently two lanes undivided in the study area. This roadway is classified as a Principal on the City of Seal Beach General Plan Circulation Element. It currently carries approximately 3,000 vehicles per day in the study area.

B. Existing Travel Lanes and Intersection Controls

Figure 2 identifies the Existing roadway conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

C. Existing Average Daily Traffic Volumes

Figure 3 depicts the Existing average daily traffic volumes. The Existing average daily traffic volumes were obtained from the 2016 Traffic Flow Map by the Orange County Transportation Authority, from daily counts collected in December 2016, and factored from peak hour counts (see Appendix B) obtained by Kunzman Associates, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 11.9 = Leg Volume.

This ratio was developed by comparing PM peak hour volume counts to daily traffic counts obtained by Kunzman Associates, Inc. in December 2016.

D. Existing Intersection Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The Existing Levels of Service for intersections in the vicinity of the project are shown in Table 1. Existing delay is based upon manual peak hour intersection turning movement counts obtained by Kunzman Associates, Inc. in December 2016 (see Figure 4). Traffic count worksheets are provided in Appendix B.

There are two peak hours in a weekday. The morning peak hour is between 7:00 AM and 9:00 AM, and the evening peak hour is between 4:00 PM and 6:00 PM. The actual peak hour within the two hour interval is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume.

The study area intersections currently operate within acceptable Levels of Service during the evening peak hour for Existing traffic conditions. Existing Level of Service worksheets are provided in Appendix C.

E. Existing Roadway Segment Peak Hour Levels of Service

In accordance with the City of Seal Beach Traffic Impact Study Guidelines, a peak hour analysis of the study roadway segments was conducted using the Highway Capacity Manual Urban Streets methodology. A roadway segment impact is considered significant when the addition of project related trips causes the following decreases in roadway link speed:

Existing Level of Service	Decrease in Link Speed
A	3.5%
B	3.0%
C	2.5%
D	2.0%
E	1.5%
F	1.0%

As shown in Table 2, the study area roadway segments currently operate within acceptable Levels of Service during the peak hour for Existing traffic conditions.

F. Existing General Plan Circulation Element

Figure 5 shows the current City of Seal Beach General Plan Circulation Element. Both existing and future roadways are included in the Circulation Element of the General Plan and are graphically depicted on Figure 5. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the land use element of the General Plan.

G. Designated Truck Routes

The City of Seal Beach designated truck route map is illustrated on Figure 6.

H. Transit Service

Figures 7 and 8 depict the lines of the two transit agencies which serve the project study area: Orange County Transportation Authority and Long Beach Transit, respectively. Transit service is provided by the Orange County Transportation Authority Transit Route 1 along Pacific Coast Highway and Route 42 along Main Street, Electric Avenue, and Pacific Coast Highway. Transit service is provided by Long Beach Transit Routes 131 and 171 along Main Street, Electric Avenue, and Pacific Coast Highway. The City of Seal Beach also operates the Shopping Shuttle that serves Leisure World residents on Thursdays from 8:00 AM to 4:30 PM as well as a Dial-A-Ride program.

I. Bicycle and Pedestrian Facilities

The City of Seal Beach designated bike paths are illustrated on Figure 9 and the existing pedestrian facilities adjacent to the project are shown in Figure 10.

Table 1

Existing Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.4-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.666-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.3-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 2

Existing Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,000	33.8	B
	Main Street	12th Street	Seal Beach	4	45,000	33.2	B
Bolsa Avenue	Silver Shoals Drive	Pacific Coast Highway	Seal Beach	2	5,200	22.1	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,200	15.1	C

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Figure 2
Existing Through Travel Lanes and Intersection Controls

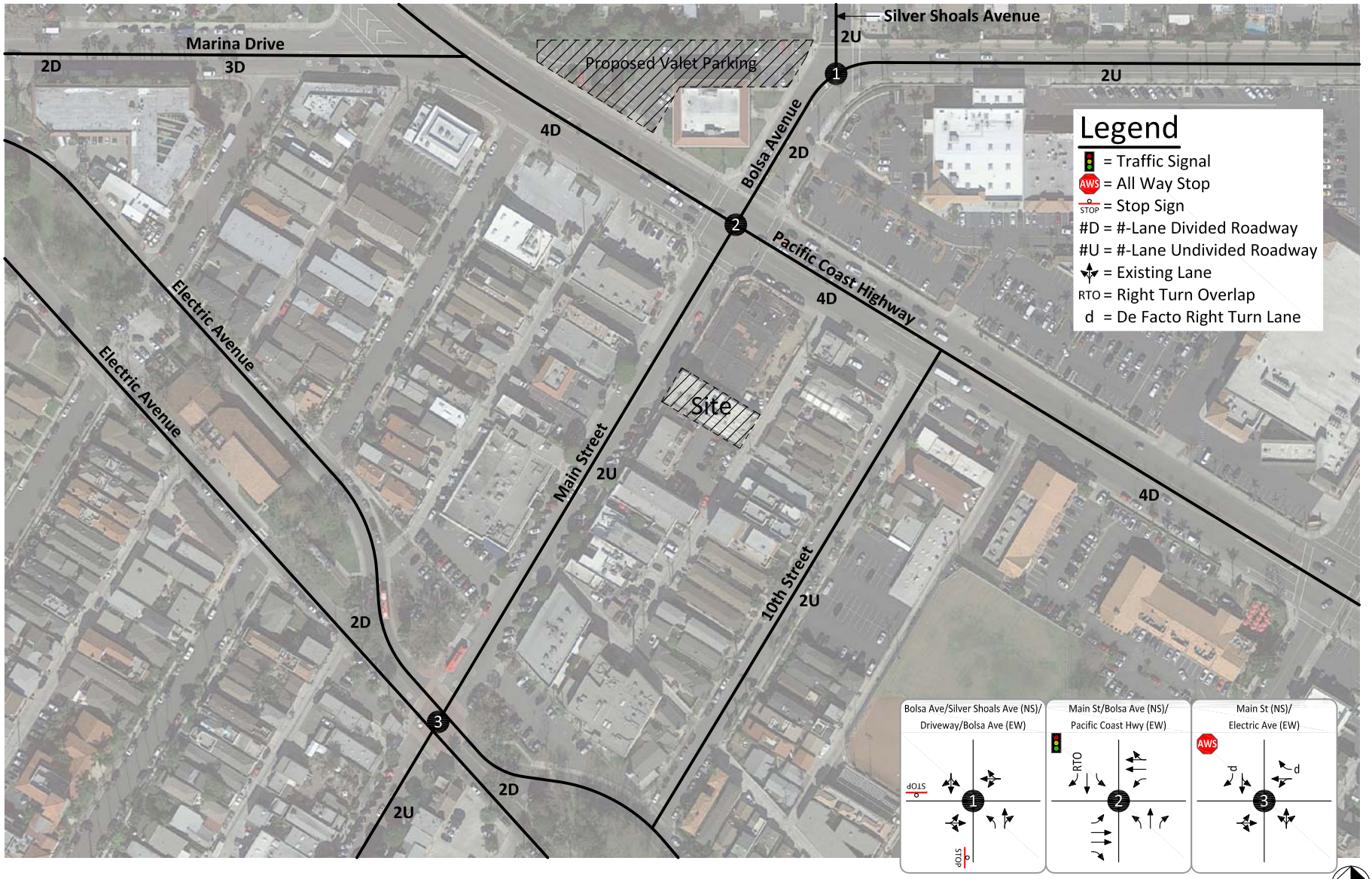

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Figure 3
Existing Average Daily Traffic Volumes

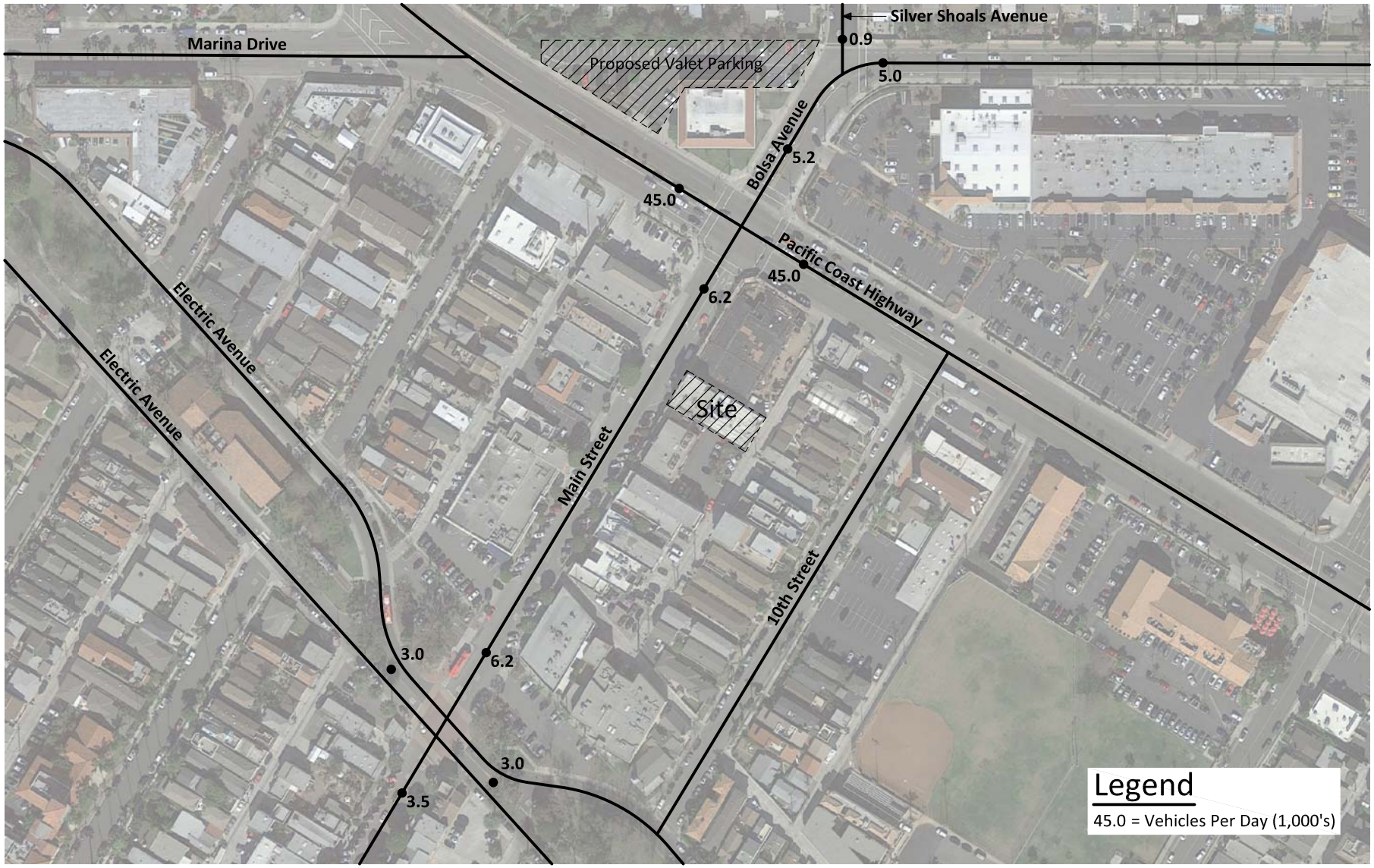

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Figure 4
Existing Evening Peak Hour Intersection Turning Movement Volumes

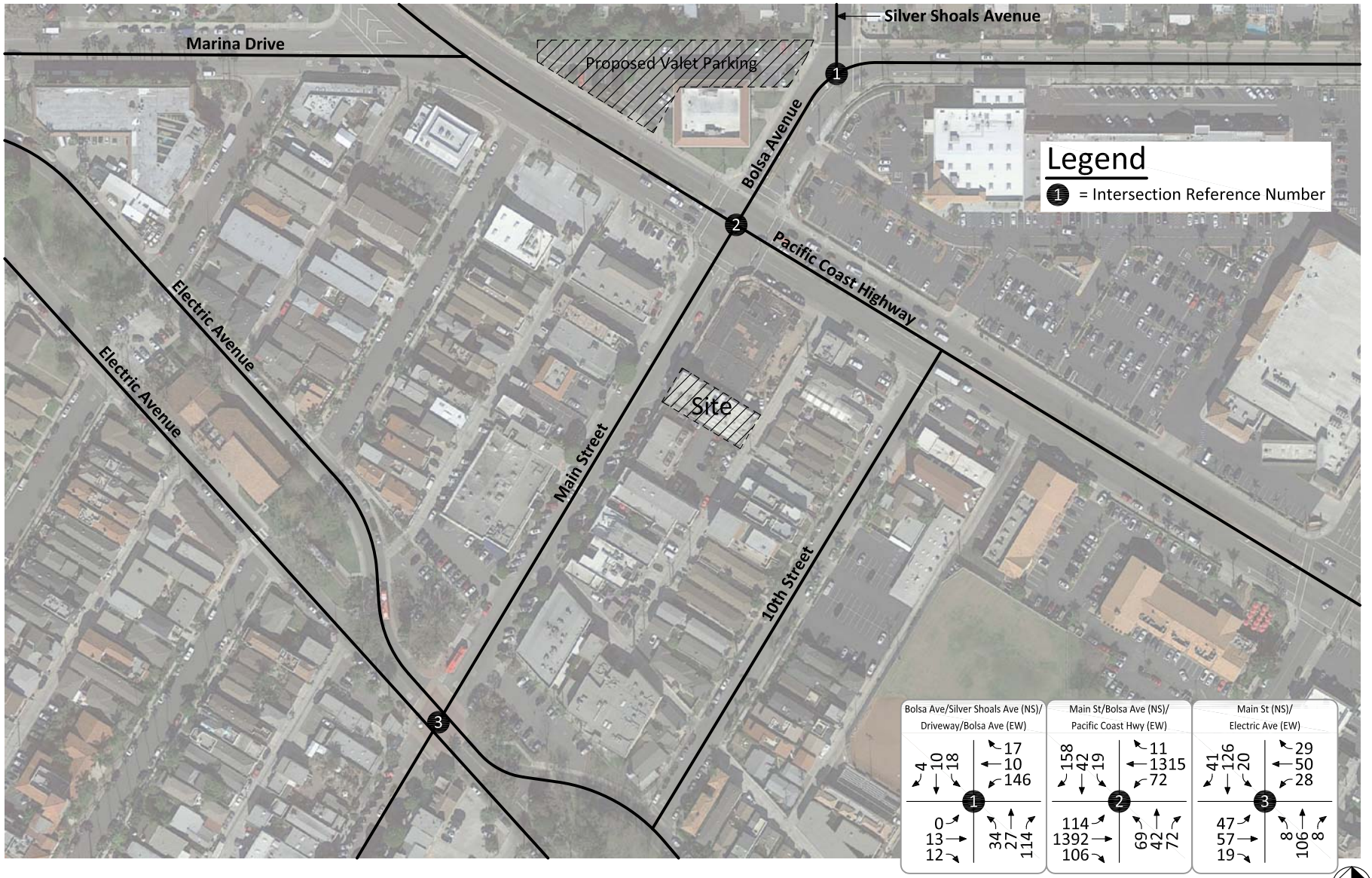

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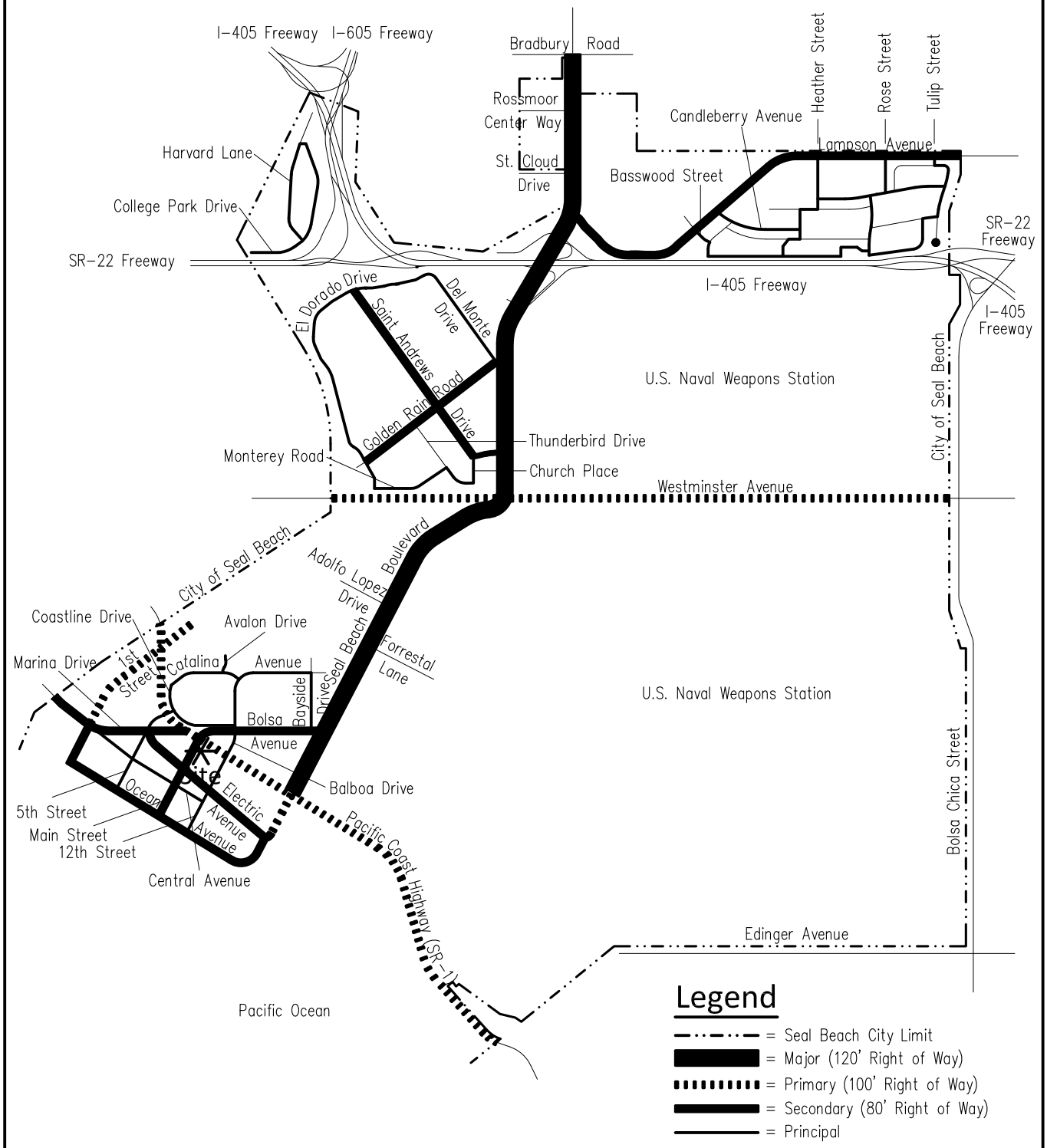
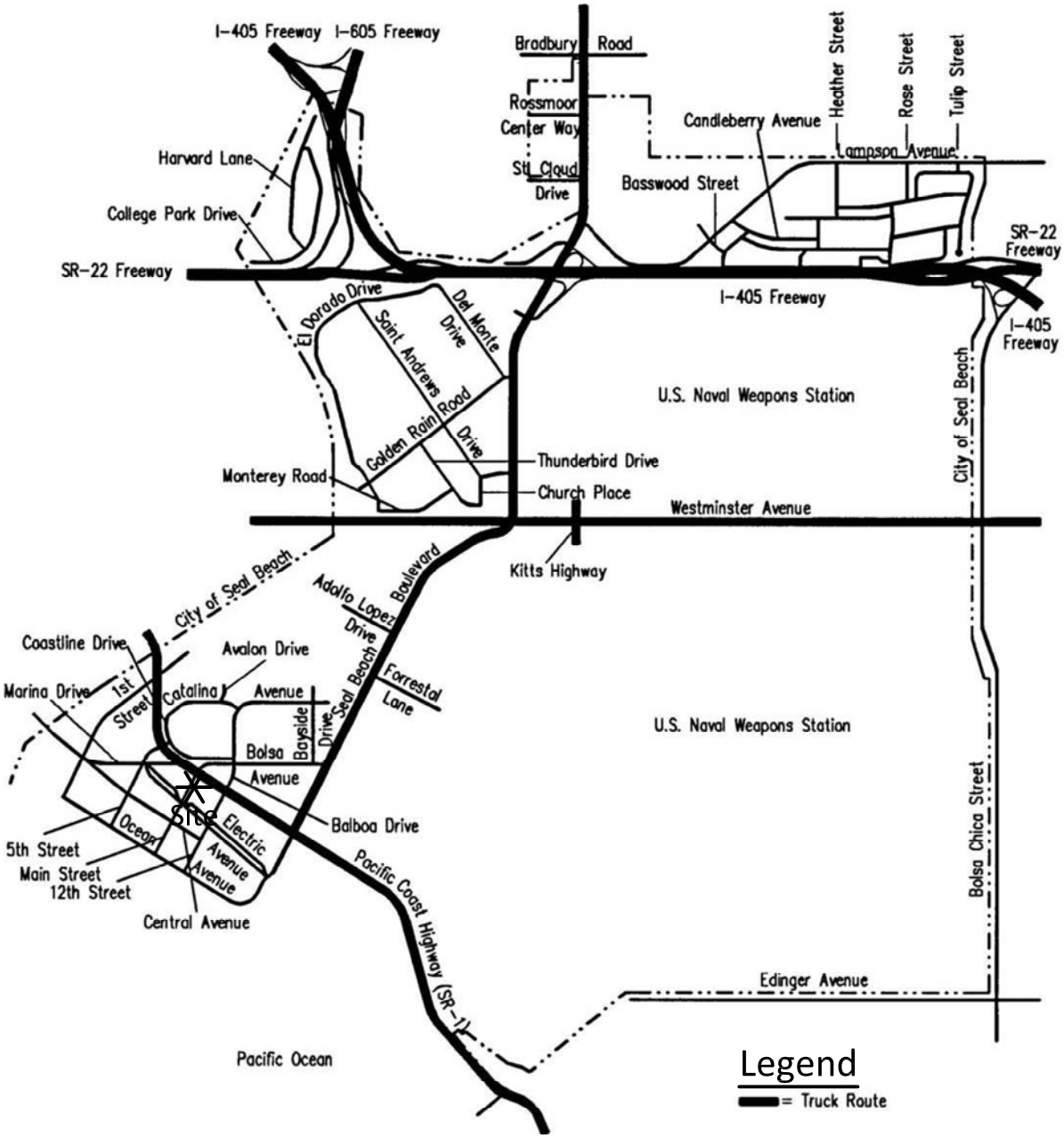
Figure 5
City of Seal Beach General Plan Circulation Element



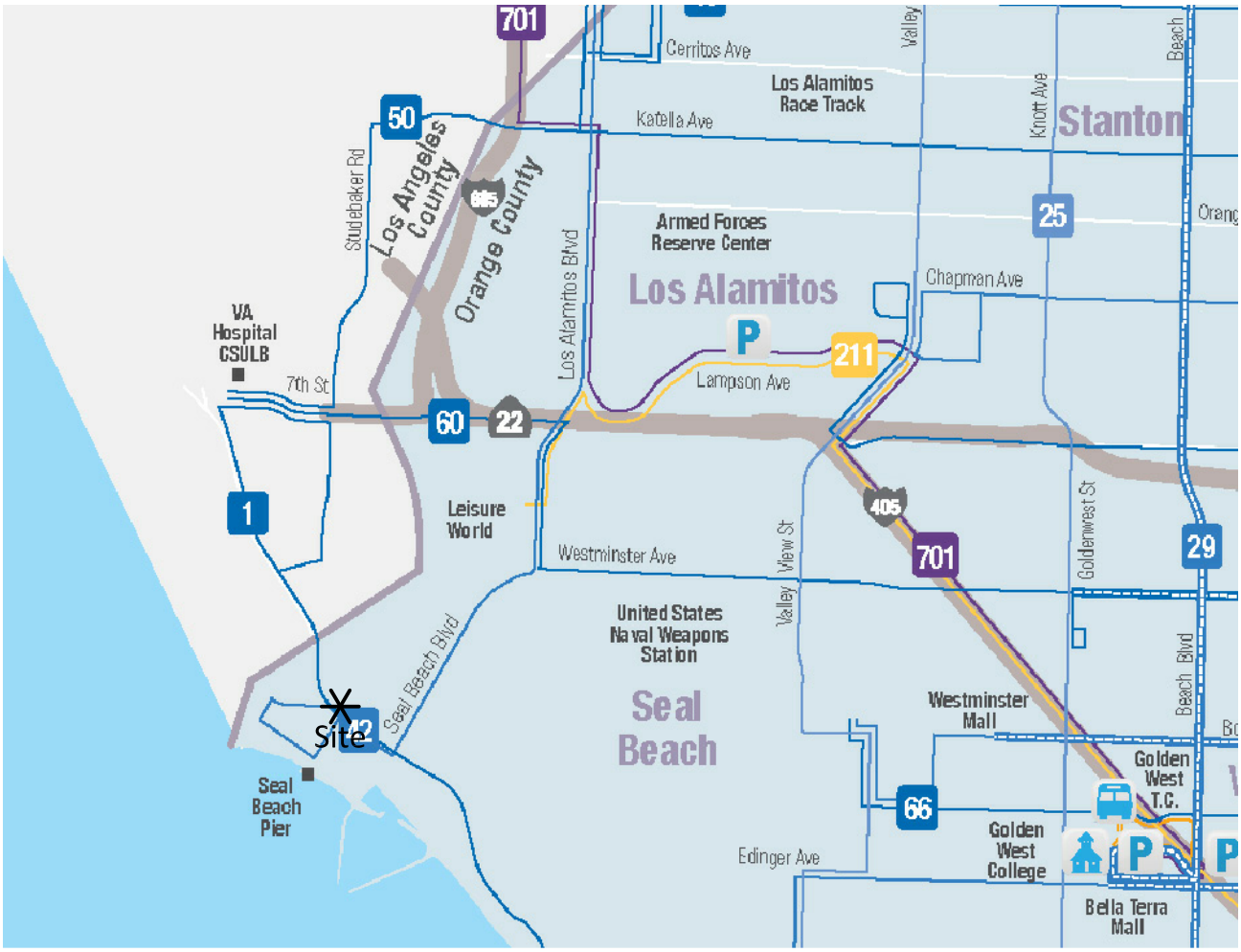
Source: City of Seal Beach

Figure 6
City of Seal Beach General Plan Truck Routes



Source: City of Seal Beach

Figure 7
Existing Transit Routes - OCTA

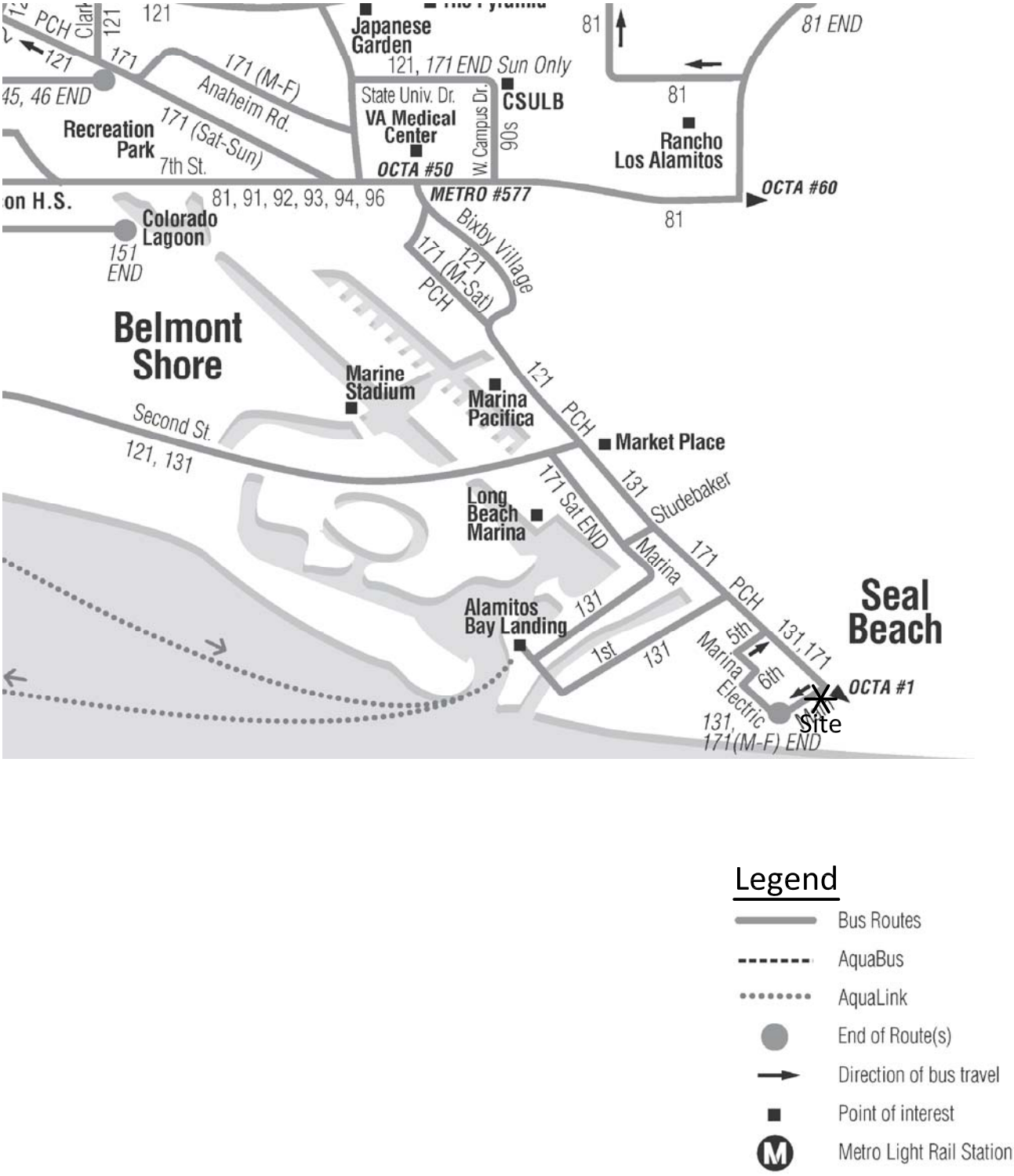


Legend

- Transit Centers
- Park-and-Rides
- Train Stations
- Schools & Universities
- 91 Express Lanes
- 0-99 Local Routes
  - 15-minutes or better service
- 100-199 Community Routes
- 200-299 Intracounty Express
- 400-499 Stationlink
- Bravo 543 with stops
- 700-799 Intercounty Express
- State Highways
- Interstate Freeways

Source: Orange County Transportation Authority

Figure 8
Existing Transit Routes - Long Beach Transit

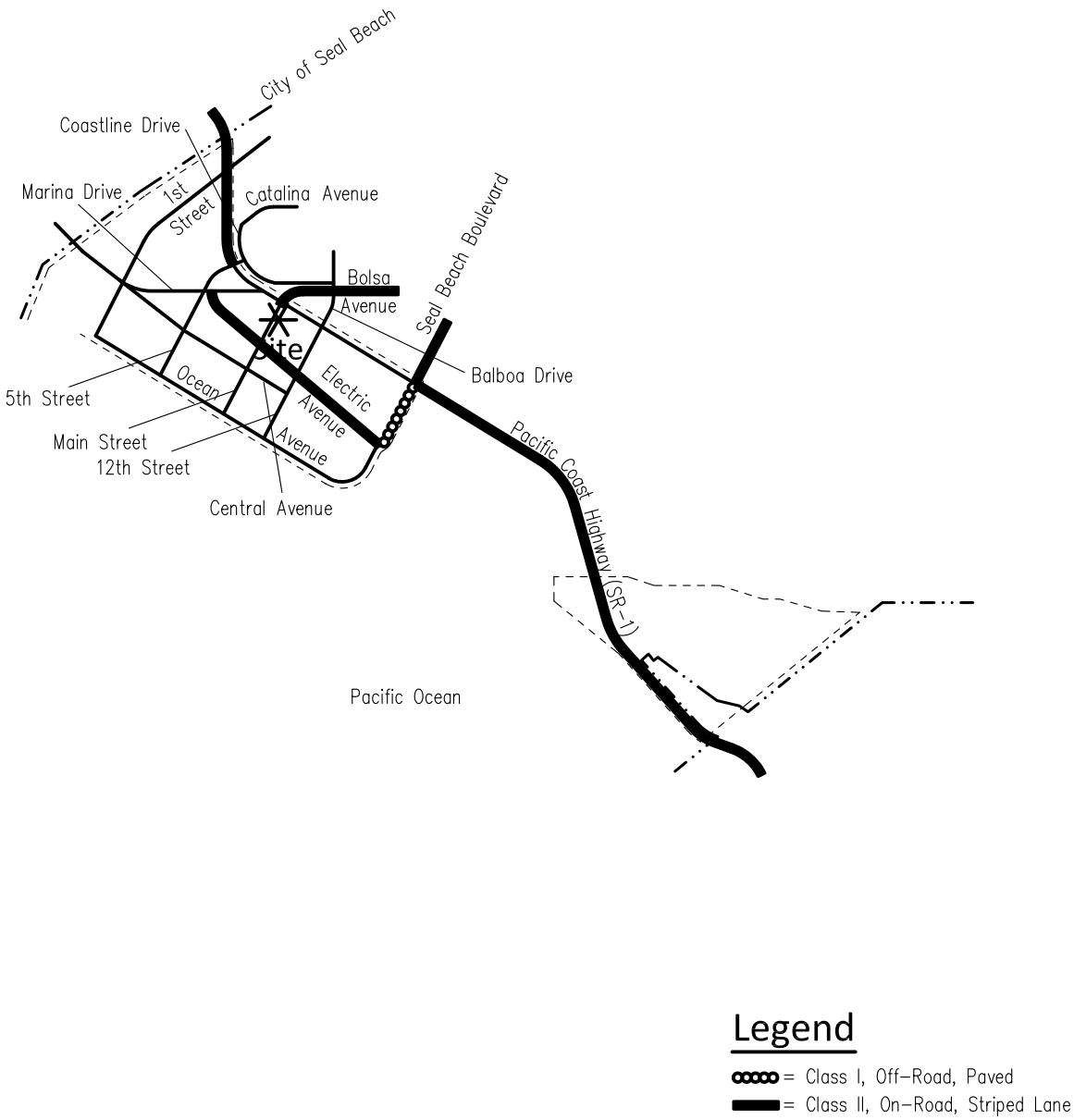


Legend

- Bus Routes
- AquaBus
- AquaLink
- End of Route(s)
- Direction of bus travel
- Point of interest
- Metro Light Rail Station

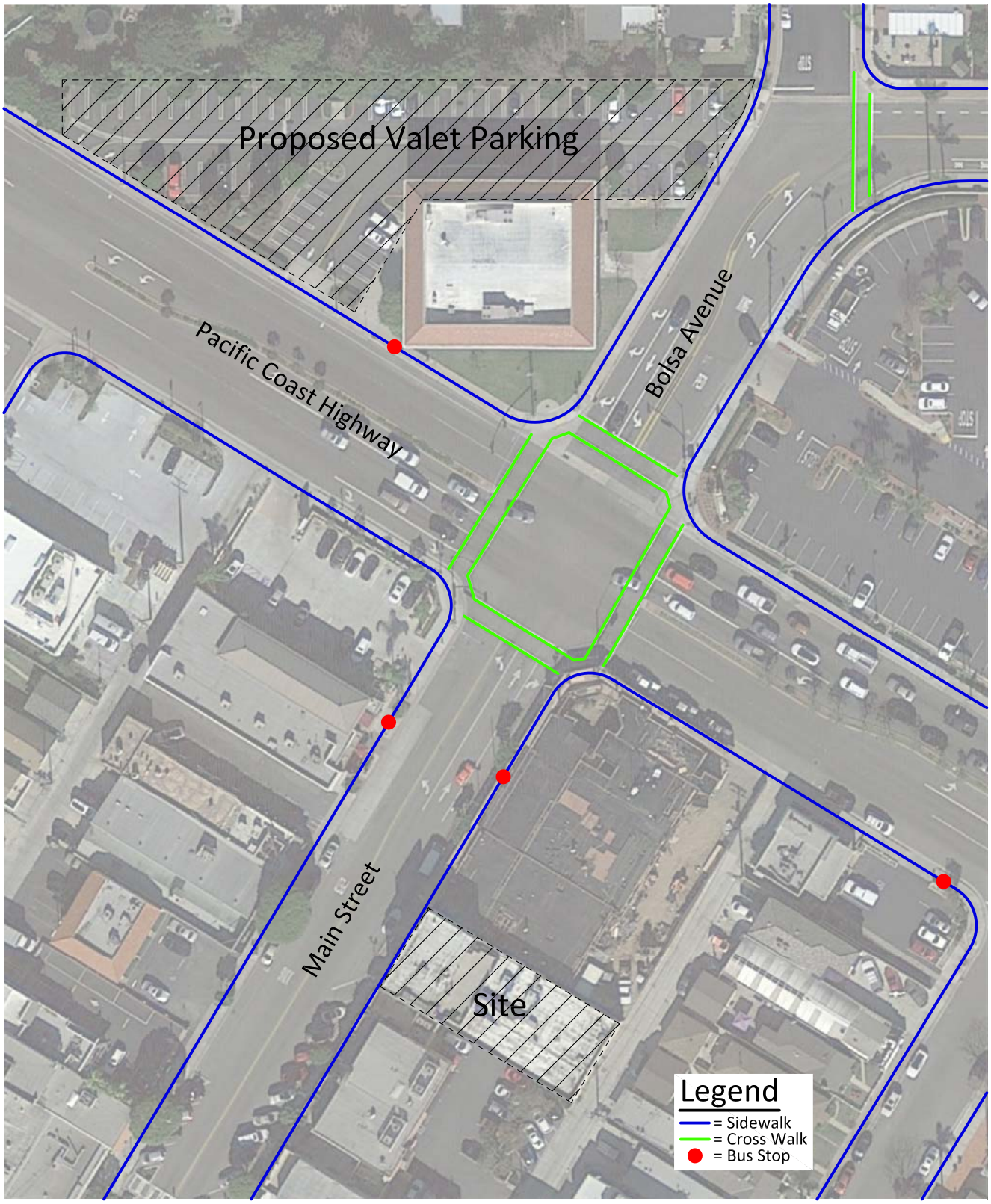
Source: Long Beach Transit

Figure 9
City of Seal Beach General Plan Bicycle Routes



Source: City of Seal Beach

Figure 10
Existing Pedestrian Facilities



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V. PROJECT TRAFFIC

The project site is constructed with a 425 seat theater that is not currently in operation. The project proposes to reconfigure the theater, resulting in a maximum of 475 seats. An existing parking lot at the northeast corner of the Main Street/Bolsa Avenue and Pacific Coast Highway intersection is proposed to be used as off-site parking. Drop-off access will be provided along Main Street.

A. Trip Generation

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and life styles remain similar to what are known today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the trip generation rates by the land use quantity, the project traffic volumes are determined. Table 3 exhibits the trip generation rates, project peak hour volumes, and project daily traffic volumes. Project traffic volumes for future projections were estimated using the Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012 and the San Diego Association of Governments, Traffic Generators, April 2002.

The proposed development is projected to generate approximately 855 daily vehicle trips, 2 of which will occur during the morning peak hour, and 33 vehicle trips of which will occur during the evening peak hour (see Table 3).

B. Trip Distribution

To determine the trip distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed. Figures 11 and 12 contain the directional distributions of the project drop-off trips for the proposed land use. Figures 13 and 14 contain the directional distributions of the project valet trips.

C. Trip Assignment

Based on the identified trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 15. Evening peak hour intersection turning movement volumes expected from the project are shown on Figure 16.

D. Modal Split

The traffic reducing potential of public transit has not been considered in this report. Essentially the traffic projections are conservative in that public transit and the private bus fleet would reduce the traffic volumes.

Table 3

Project Trip Generation[1]

Land Use	Quantity	Units[2]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates									
Movie Theater		Seats	0.003	0.003	0.005	0.027	0.043	0.070	1.800
Trips Generated									
Movie Theater	475	Seats	1	1	2	13	20	33	855

[1] Source: Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012, Land Use Code 444. Because ITE land use code 444 does not include AM peak hour or daily generation rates, the rates for Multiplex Theater with Matinee were obtained from the San Diego Association of Governments (SANDAG), Traffic Generators, April 2002.

Figure 11
Project Outbound Trip Distribution - Drop-Off

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Figure 12
Project Inbound Trip Distribution - Drop-Off

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Figure 13
Project Outbound Trip Distribution - Valet

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Figure 14
Project Inbound Trip Distribution - Valet

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Figure 15
Project Average Daily Traffic Volumes

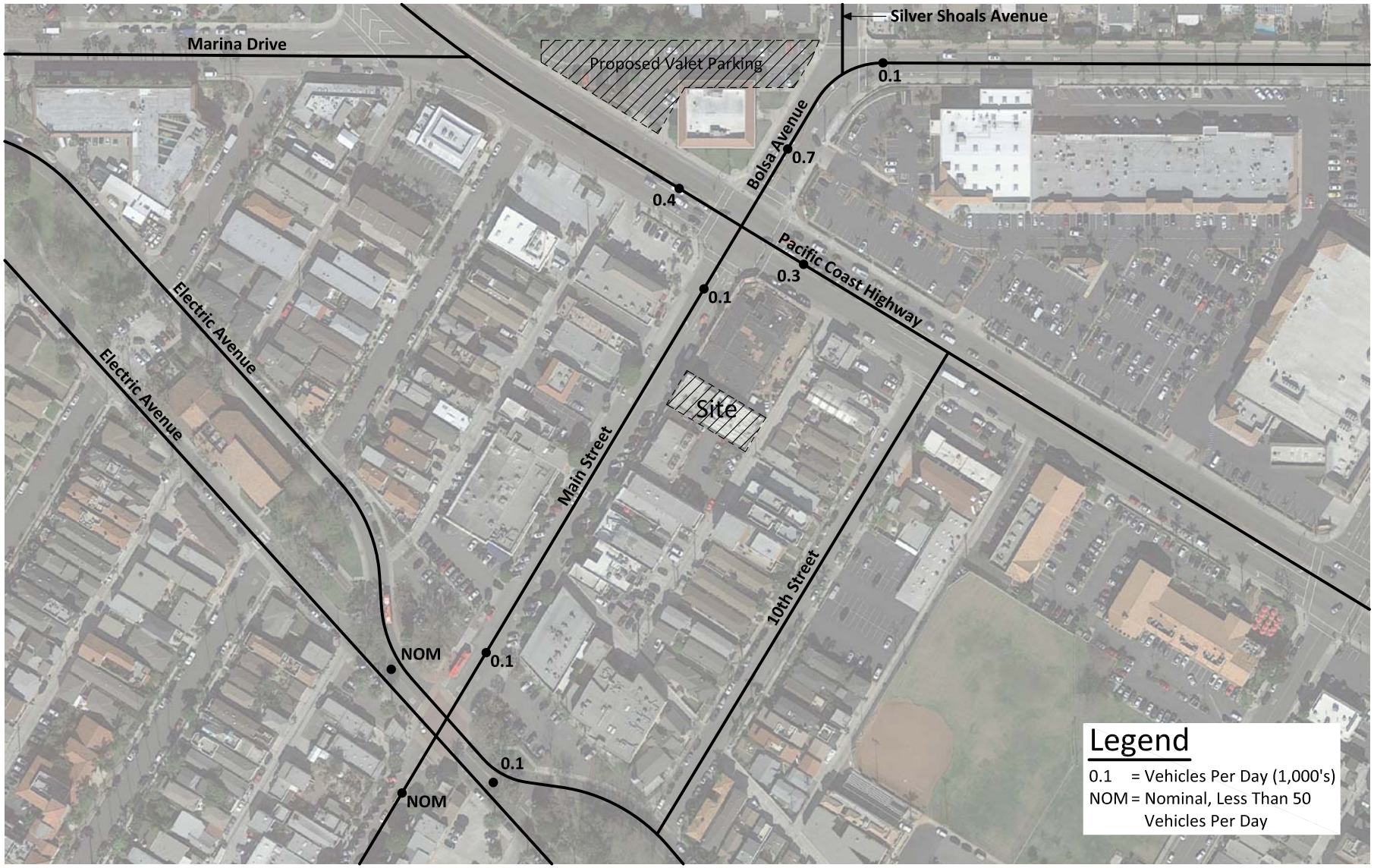

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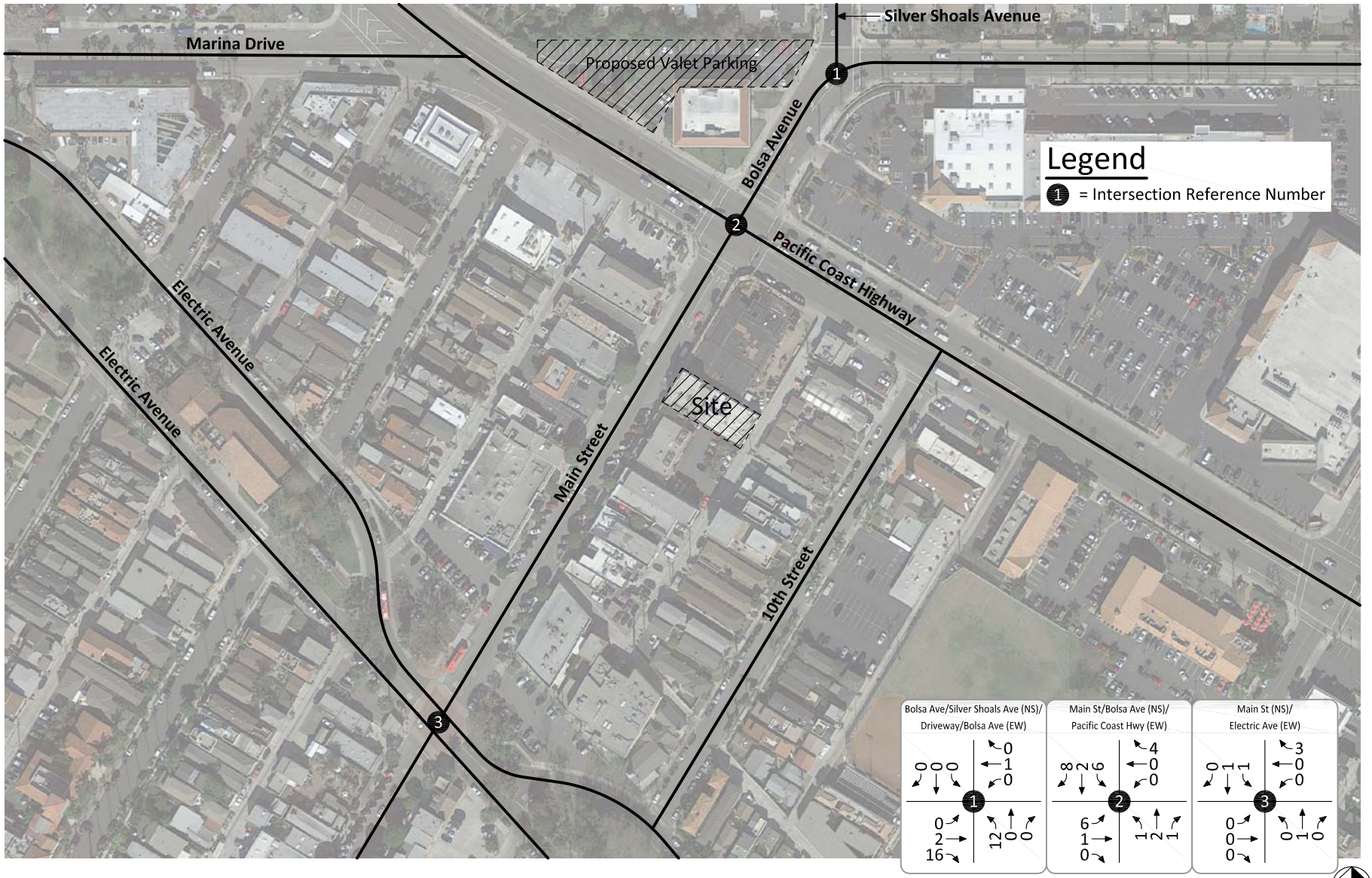
Figure 16
Project Evening Peak Hour Intersection Turning Movement Volumes



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VI. FUTURE TRAFFIC CONDITIONS

To assess future traffic conditions, existing traffic is combined with ambient growth, other development, and project traffic. The opening year for analysis purposes in this report is 2017. The buildout year is 2036.

A. Method of Projection

1. Ambient Growth

To account for ambient growth on roadways, Opening Year (2017) and Buildout traffic volumes have been calculated based on an annual growth rate of existing traffic volumes over a one and twenty year period, respectively. The 1.14 percent annual areawide growth rate has been developed from the Orange County Transportation Analysis Model (see Appendix D).

2. Other Development

The City of Seal Beach staff provided information about other developments in the study area. Other developments within the study area were included in the analysis if they are not currently built, are approved, their approval has not expired, and they would contribute trips to the study area intersections.

Table 4 lists the proposed land use for the other development (see Figure 17), and shows the daily and peak hour vehicle trips generated by the other development in the study area. The trip distribution for the other development is shown on Figure 18. Figure 19 shows the other development evening peak hour intersection turning movement volumes.

B. Average Daily Traffic Volumes

1. Existing Plus Project

For Existing Plus Project traffic conditions, existing traffic is combined with project traffic. Figure 20 shows the average daily traffic volumes that can be expected for Existing Plus Project traffic conditions.

2. Existing Plus Project Plus Cumulative

For Existing Plus Project Plus Cumulative traffic conditions, existing traffic is combined with project traffic and other development traffic. Figure 21 shows the average daily traffic volumes that can be expected for Existing Plus Project Plus Cumulative traffic conditions.

3. Opening Year (2017) Without Project

For Opening Year (2017) Without Project traffic conditions, existing traffic is combined with ambient growth traffic. Figure 22 shows the average daily traffic volumes that can be expected for Opening Year (2017) Without Project traffic conditions.

4. Opening Year (2017) With Project

For Opening Year (2017) With Project traffic conditions, existing traffic is combined with ambient growth traffic and project traffic. Figure 23 shows the average daily traffic volumes that can be expected for Opening Year (2017) With Project traffic conditions.

5. Opening Year (2017) With Project Plus Cumulative

For Opening Year (2017) With Project Plus Cumulative traffic conditions, existing traffic is combined with ambient growth traffic, project traffic, and other development traffic. Figure 24 shows the average daily traffic volumes that can be expected for Opening Year (2017) With Project traffic conditions.

6. Buildout Without Project

For Buildout Without Project traffic conditions, existing traffic is combined with ambient growth traffic. Figure 25 shows the average daily traffic volumes that can be expected for Buildout Without Project traffic conditions.

7. Buildout With Project

For Buildout With Project traffic conditions, existing traffic is combined with ambient growth traffic and project traffic. Figure 26 shows the average daily traffic volumes that can be expected for Buildout With Project traffic conditions.

8. Buildout With Project Plus Cumulative

For Buildout With Project Plus Cumulative traffic conditions, existing traffic is combined with ambient growth traffic, project traffic, and other development traffic. Figure 27 shows the average daily traffic volumes that can be expected for Buildout With Project traffic conditions.

C. Intersection Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a percent. The percent represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The project access intersections analyzed in this report are unsignalized intersections. The Intersection Delay Methodology for unsignalized intersections was calculated using the delay methodology in the Highway Capacity Manual throughout this traffic impact analysis.

1. Existing Plus Project

   The Levels of Service for the Existing Plus Project traffic conditions have been calculated and are shown in Table 5. Existing Plus Project traffic evening peak hour intersection turning movement volumes are shown on Figure 28.

   The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Existing Plus Project traffic conditions.

2. Existing Plus Project Plus Cumulative

   The Levels of Service for the Existing Plus Project Plus Cumulative traffic conditions have been calculated and are shown in Table 6. Existing Plus Project Plus Cumulative traffic evening peak hour intersection turning movement volumes are shown on Figure 29.

   The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Existing Plus Project Plus Cumulative traffic conditions.

3. Opening Year (2017) Without Project

   The Levels of Service for the Opening Year (2017) Without Project traffic conditions have been calculated and are shown in Table 7. Opening Year (2017) Without Project traffic evening peak hour intersection turning movement volumes are shown on Figure 30.

   The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) Without Project traffic conditions.

4. Opening Year (2017) With Project

   The Levels of Service for the Opening Year (2017) With Project traffic conditions have been calculated and are shown in Table 8. Opening Year (2017) With Project traffic evening peak hour intersection turning movement volumes are shown on Figure 31.

   The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) With Project traffic conditions.

5. Opening Year (2017) With Project Plus Cumulative

The Levels of Service for the Opening Year (2017) With Project Plus Cumulative traffic conditions have been calculated and are shown in Table 9. Opening Year (2017) With Project Plus Cumulative traffic evening peak hour intersection turning movement volumes are shown on Figure 32.

The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Opening Year (2017) With Project Plus Cumulative traffic conditions.

6. Buildout Without Project

The Levels of Service for the Buildout Without Project traffic conditions have been calculated and are shown in Table 10. Buildout Without Project traffic evening peak hour intersection turning movement volumes are shown on Figure 33.

The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout Without Project traffic conditions.

7. Buildout With Project

The Levels of Service for the Buildout With Project traffic conditions have been calculated and are shown in Table 11. Buildout With Project traffic evening peak hour intersection turning movement volumes are shown on Figure 34.

The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout With Project traffic conditions.

8. Buildout With Project Plus Cumulative

The Levels of Service for the Buildout With Project Plus Cumulative traffic conditions have been calculated and are shown in Table 12. Buildout With Project Plus Cumulative traffic evening peak hour intersection turning movement volumes are shown on Figure 35.

The study area intersections are projected to operate within acceptable Levels of Service during the evening peak hour for Buildout With Project Plus Cumulative traffic conditions.

E. Roadway Segment Peak Hour Levels of Service

In accordance with the City of Seal Beach Traffic Impact Study Guidelines, a peak hour analysis of the study roadway segments was conducted using the Highway Capacity Manual Urban Streets methodology.

A roadway segment impact is considered significant when the addition of project related trips causes the following decreases in roadway link speed:

Existing Level of Service	Decrease in Link Speed
A	3.5%
B	3.0%
C	2.5%
D	2.0%
E	1.5%
F	1.0%

1. Existing Plus Project

   As shown in Table 13, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions.

   The addition of project related traffic does not result in a significant impact on any study area roadway segments.

2. Existing Plus Project Plus Cumulative

   As shown in Table 14, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project Plus Cumulative traffic conditions.

3. Opening Year (2017) Without Project

   As shown in Table 15, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) Without Project traffic conditions.

4. Opening Year (2017) With Project

   As shown in Table 16, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) With Project traffic conditions.

   The addition of project related traffic does not result in a significant impact on any study area roadway segments.

5. Opening Year (2017) With Project Plus Cumulative

   As shown in Table 17, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2017) With Project Plus Cumulative traffic conditions.

6. Buildout Without Project

As shown in Table 18, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout Without Project traffic conditions.

7. Buildout With Project

As shown in Table 19, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout With Project traffic conditions.

The study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout With Project traffic conditions. The segment of Main Street between Electric Avenue and Pacific Coast Highway is projected to operate at Level of Service E. However, the City of Seal Beach has adopted the Main Street Specific Plan which recognizes Main Street as a "combination parking and traffic street" which would never achieve the Level of Service D standard due to its nature as the commercial center of the city.

8. Buildout With Project Plus Cumulative

As shown in Table 20, the study area roadway segments are projected to operate within acceptable Levels of Service during the peak hours for Buildout With Project Plus Cumulative traffic conditions.

Table 4

Other Development Trip Generation[1,2]

Land Use	Peak Hour						Daily
	Morning			Evening			
	Inbound	Outbound	Total	Inbound	Outbound	Total	
Existing Trips Generated							
Service Station	21	20	41	32	32	64	782
Proposed Trips Generated							
Dessert Shop	5	5	10	3	3	6	114
Retail	4	2	6	8	8	16	262
General Office	8	1	9	1	7	8	62
Martial Arts Studio	3	2	5	15	15	30	146
Subtotal	20	10	30	27	33	60	584
Net Trips Generated	-1	-10	-11	-5	1	-4	-198

[1] Source: Addendum to the Traffic Impact Analysis Report for the Main & PCH Mixed-Use Center Project, Linscott, Law, & Greenspan, September 2016.

[2] Though the other development shown results in a net loss of trips, some individual turning movement volumes increased. These increased volumes were included in the analysis.

Table 5

Existing Plus Project Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.7-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.673-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.3-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 6

Existing Plus Project Plus Cumulative Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.7-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.677-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.4-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 7

Opening Year (2017) Without Project Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.5-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.672-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.3-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 8

Opening Year (2017) With Project Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.7-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.679-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.3-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 9

Opening Year (2017) With Project Plus Cumulative Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	11.7-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.683-B
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	9.4-A

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 10

Buildout Without Project Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	12.2-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.797-C
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	10.0-B

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 11

Buildout With Project Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	12.5-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.804-D
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	10.1-B

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 12

Buildout With Project Plus Cumulative Intersection Levels of Service[1]

Intersection	Jurisdiction	Traffic Control[4]	Intersection Approach Lanes[1]												Evening Peak Hour V/C or Delay-LOS[3]
			Northbound			Southbound			Eastbound			Westbound			
			L	T	R	L	T	R	L	T	R	L	T	R	
Bolsa Avenue/Silver Shoals Avenue (NS) at: Chase Driveway/Bolsa Avenue (EW) - #1	Seal Beach	CSS	1	1	0	0	1	0	0	1	0	0	1	0	12.5-B
Main Street/Bolsa Avenue (NS) at: Pacific Coast Highway (EW) - #2	Seal Beach	TS	1	1	1	1	1	1	1	2	1	1	1.5	0.5	0.808-D
Main Street (NS) at: Electric Avenue (EW) - #3	Seal Beach	AWS	0	1	0	0.5	1	d	0	1	0	0.5	0.5	d	10.1-B

[1] Intersection Capacity Utilization calculations are conducted for signalized intersections. Highway Capacity Delay calculations are conducted for non-signalized intersections.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane

[3] Volume to capacity ratio (V/C), delay (shown in seconds), and Level of Service (LOS) have been calculated using the following analysis software: Vistro, Version 4.00-00 (2015). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

Table 13

Existing Plus Project Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour		Significant Impact?
	From	To				Average Speed (MPH)	Level of Service	
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,380	33.8	B	No
	Main Street	12th Street	Seal Beach	4	45,306	33.2	B	No
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	5,900	22.0	C	No
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,321	15.1	C	No

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 14

Existing Plus Project Plus Cumulative Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,380	33.8	B
	Main Street	12th Street	Seal Beach	4	45,306	33.1	B
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	5,900	21.3	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,321	14.5	C

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 15

Opening Year (2017) Without Project Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,513	33.8	B
	Main Street	12th Street	Seal Beach	4	45,513	33.2	B
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	5,259	22.1	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,271	15.1	C

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 16

Opening Year (2017) With Project Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour		Significant Impact?
	From	To				Average Speed (MPH)	Level of Service	
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,893	33.8	B	No
	Main Street	12th Street	Seal Beach	4	45,819	33.2	B	No
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	5,959	22.0	C	No
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,392	15.0	C	No

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 17

Opening Year (2017) With Project Plus Cumulative Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	45,893	33.8	B
Pacific Coast Highway	Main Street	12th Street	Seal Beach	4	45,819	33.1	B
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	5,959	21.3	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	6,392	14.4	C

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 18

Buildout Without Project Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	56,451	34.3	B
Pacific Coast Highway	Main Street	12th Street	Seal Beach	4	56,451	33.3	B
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	6,523	19.9	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	7,778	7.4	E

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 19

Buildout With Project Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour		Significant Impact?
	From	To				Average Speed (MPH)	Level of Service	
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	56,831	34.3	B	No
	Main Street	12th Street	Seal Beach	4	56,757	33.3	B	No
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	7,223	19.9	C	No
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	7,899	7.1	E	Yes

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Table 20

Buildout With Project Plus Cumulative Roadway Segment Peak Hour Level of Service

Roadway	Segment		Jurisdiction	Number of Through Lanes	Average Daily Traffic Volume	Peak Hour	
	From	To				Average Speed (MPH)	Level of Service
Pacific Coast Highway	Marina Drive	Main Street	Seal Beach	4	56,831	34.0	B
	Main Street	12th Street	Seal Beach	4	56,757	33.3	B
Bolsa Avenue	Silver Shoals Avenue	Pacific Coast Highway	Seal Beach	2	7,223	19.9	C
Main Street	Pacific Coast Highway	Electric Avenue	Seal Beach	2	7,899	7.1	E

[1] Level of Service (LOS) have been calculated using the Highway Capacity Manual methodology as implemented in the HCS Urban Streets, Version 5.5.

Figure 17
Other Development Location map

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Figure 18
Other Development Trip Distribution

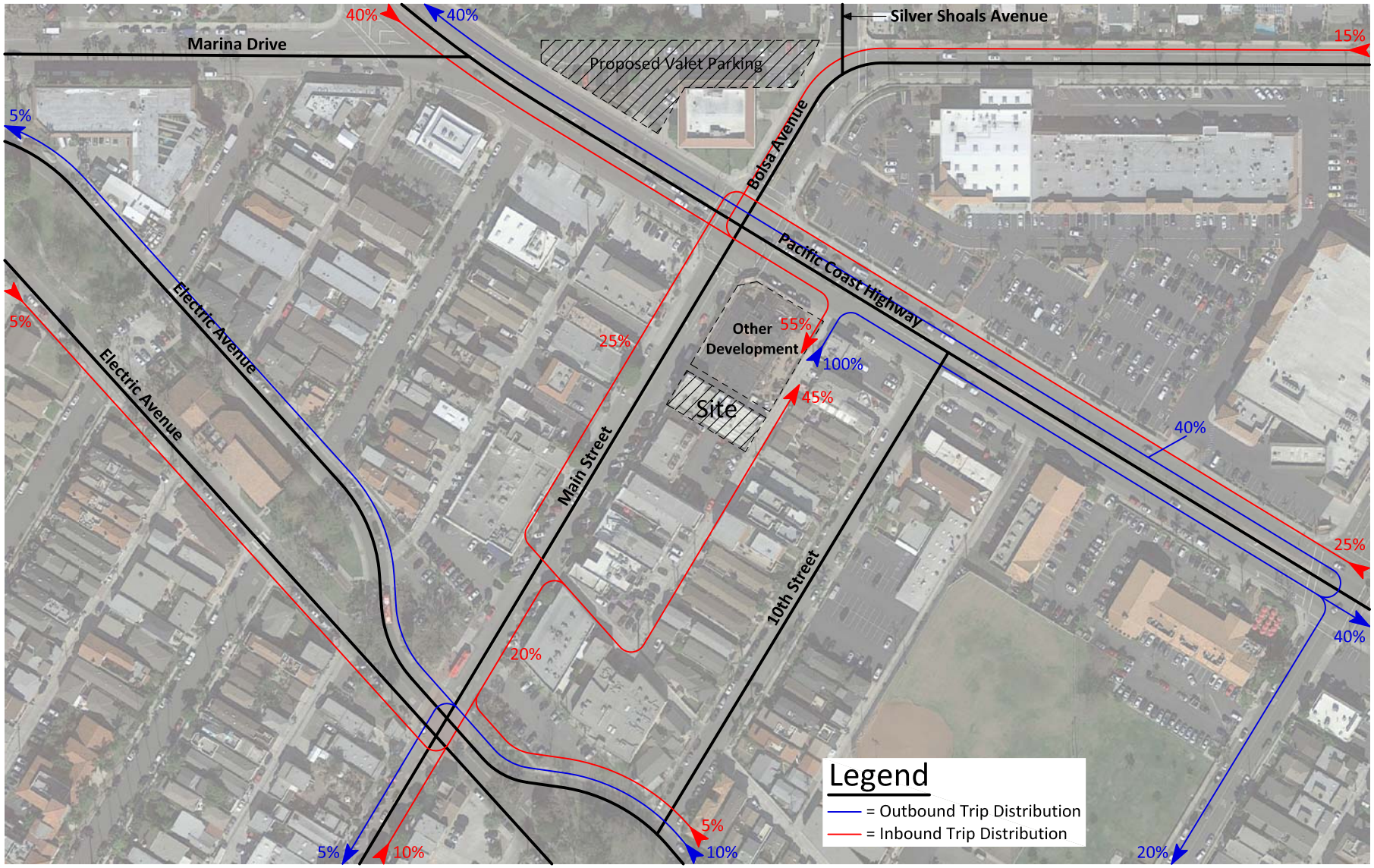

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Figure 19
Other Development
Evening Peak Hour Intersection Turning Movement Volumes

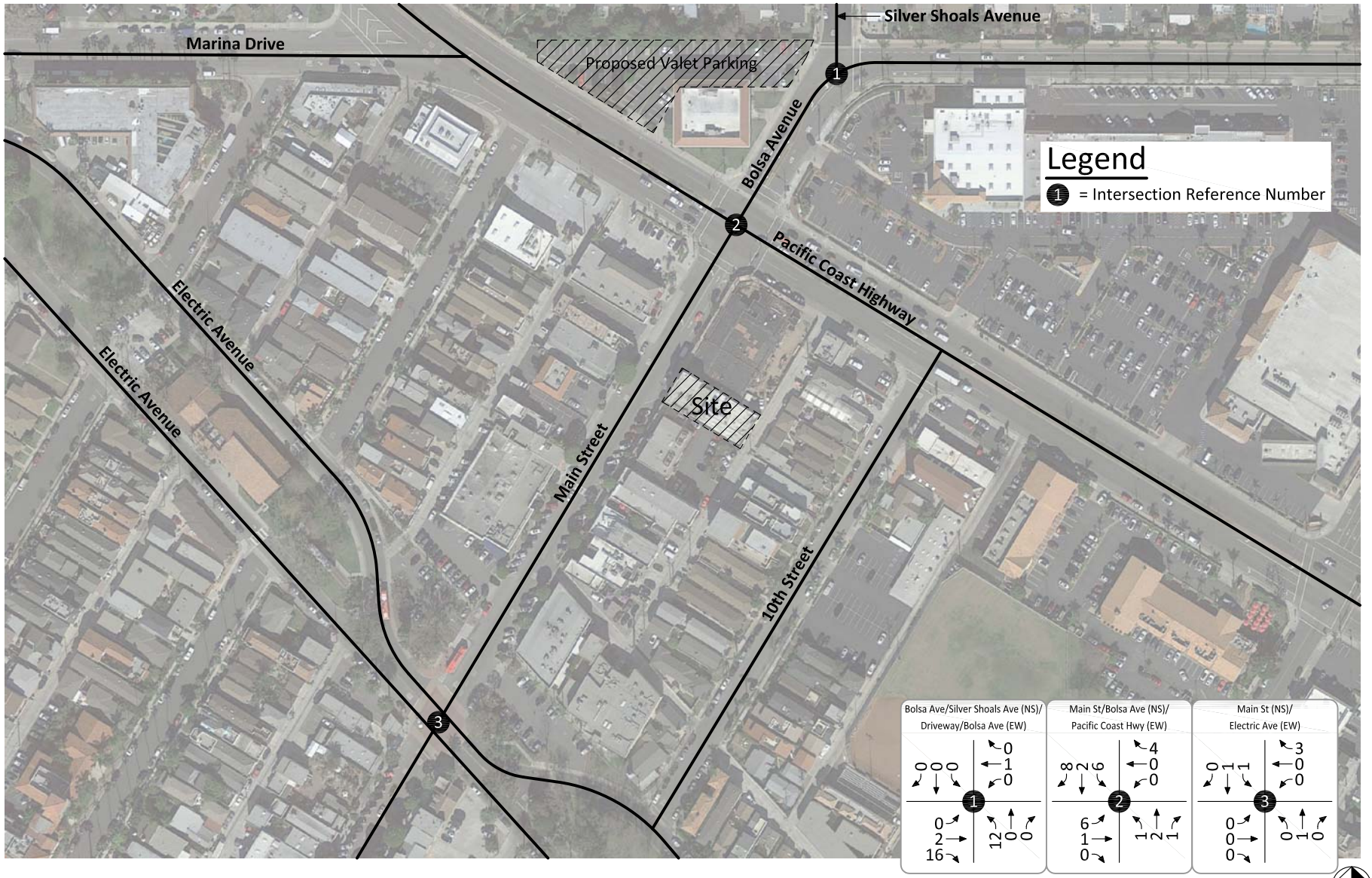

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Figure 20
Existing Plus Project Average Daily Traffic Volumes

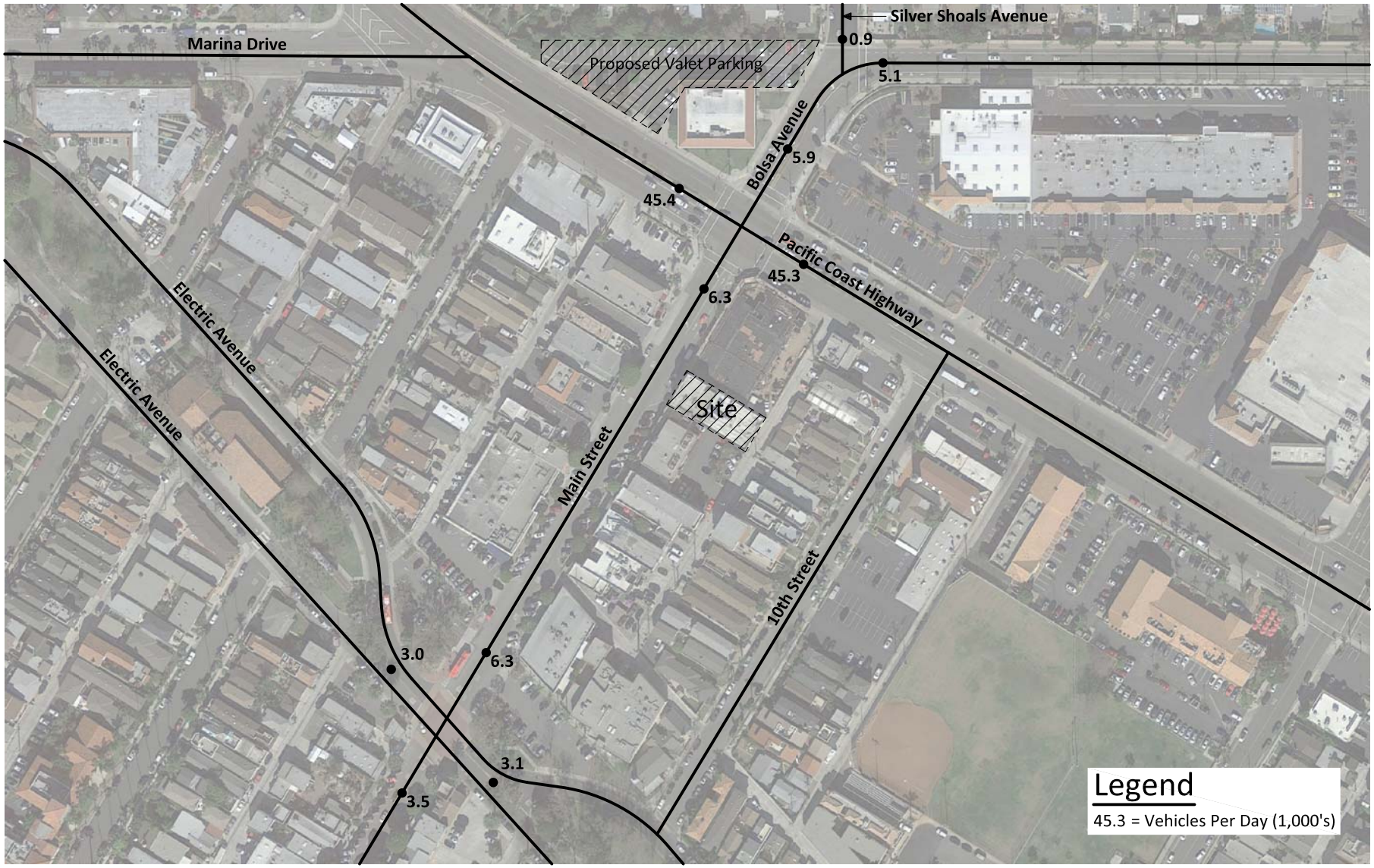

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Figure 21
Existing Plus Project Plus Cumulative Average Daily Traffic Volumes

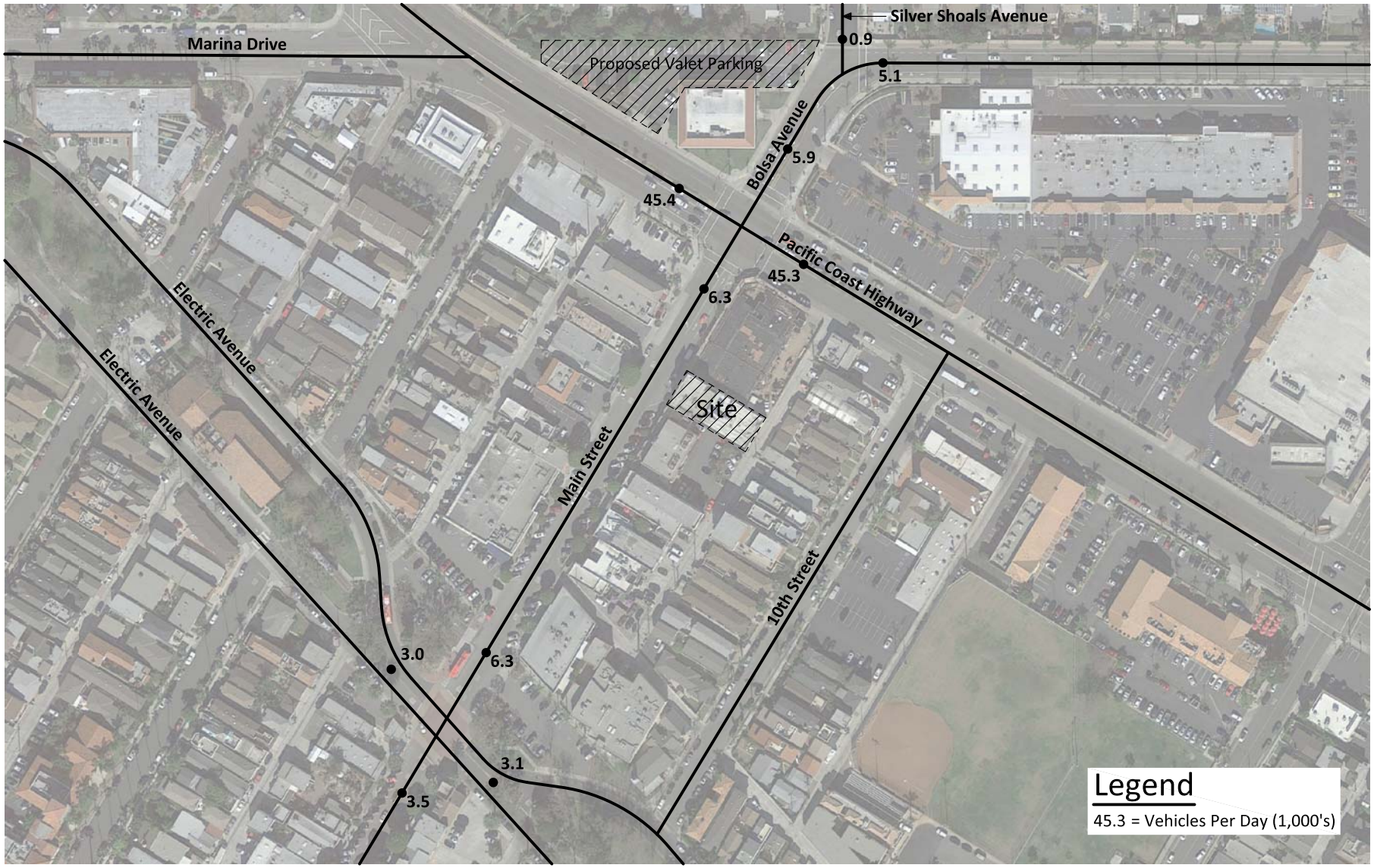

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Figure 22
Opening Year (2017) Without Project Average Daily Traffic Volumes

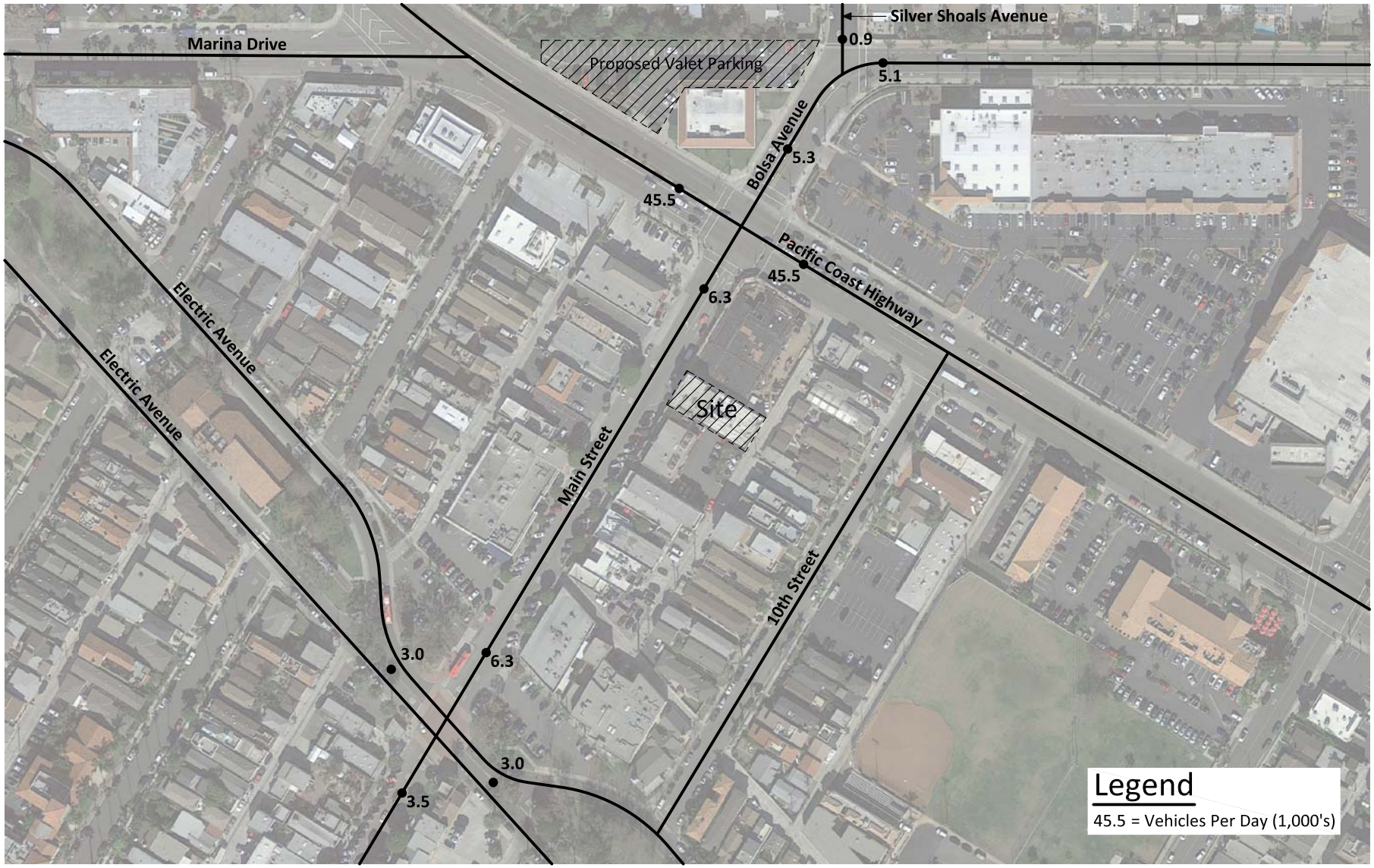

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Figure 23
Opening Year (2017) With Project Average Daily Traffic Volumes

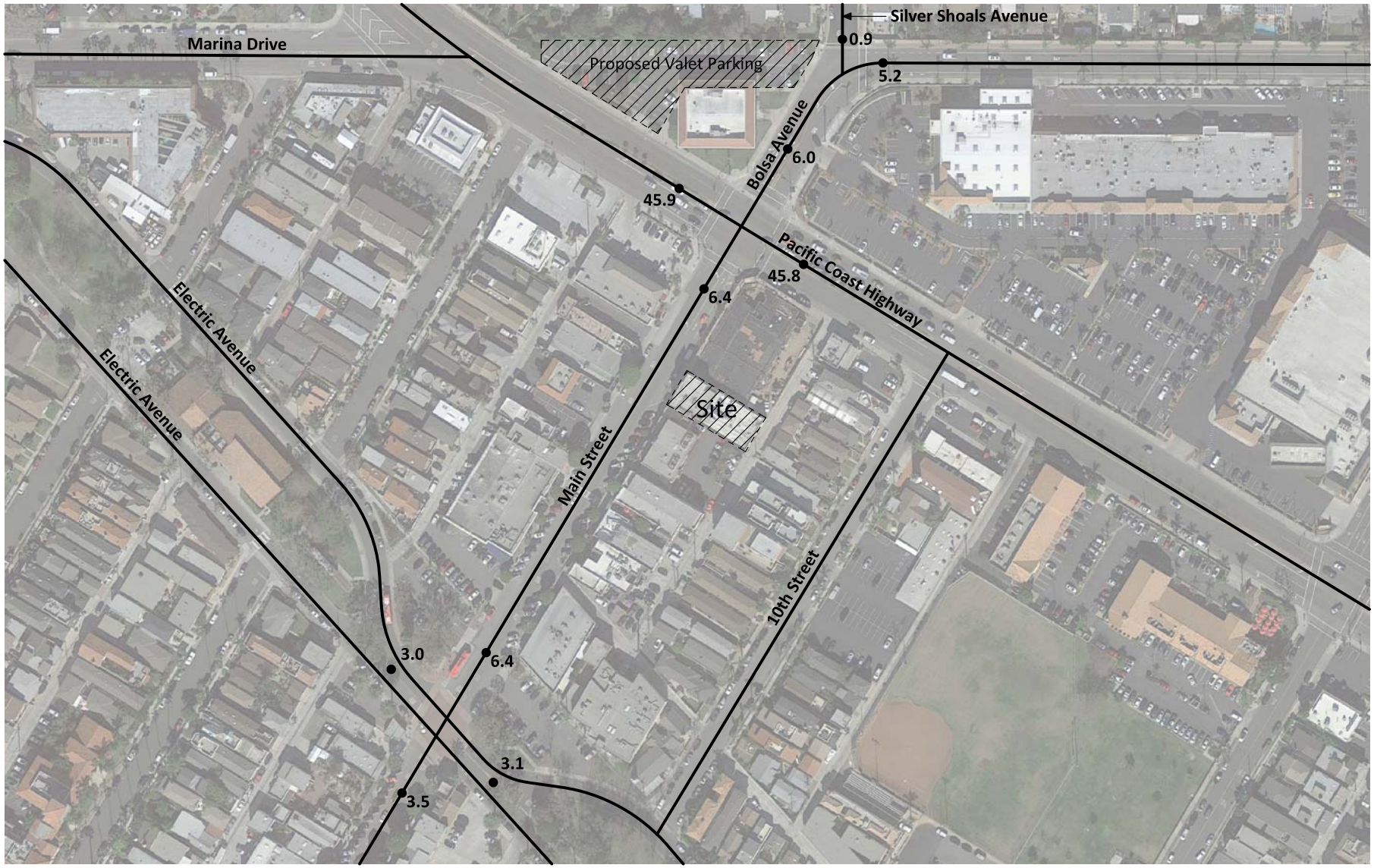

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Figure 24
Opening Year (2017) With Project Plus Cumulative
Average Daily Traffic Volumes

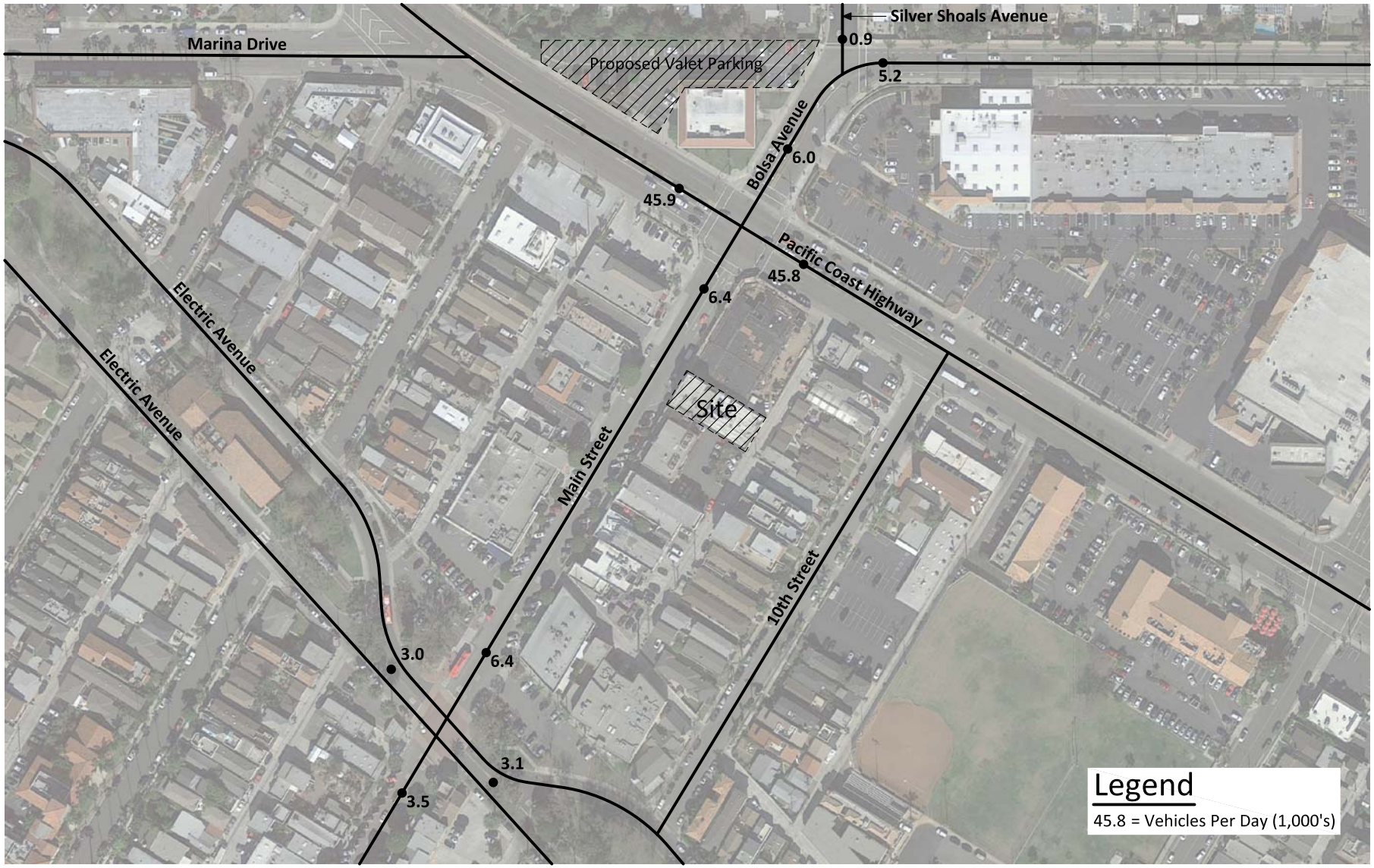

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Figure 25
Buildout Without Project Average Daily Traffic Volumes

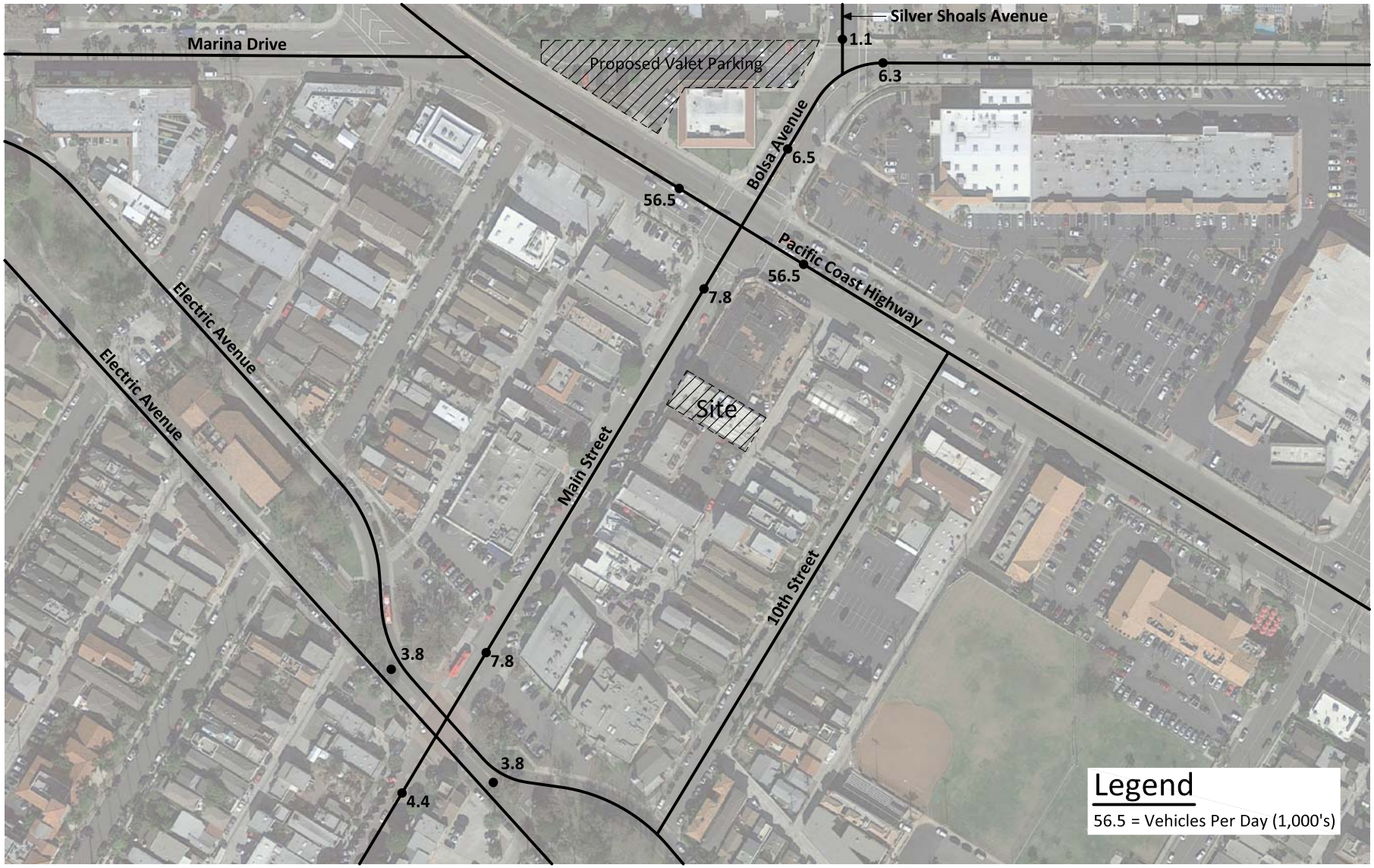

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Figure 26
Buildout With Project Average Daily Traffic Volumes

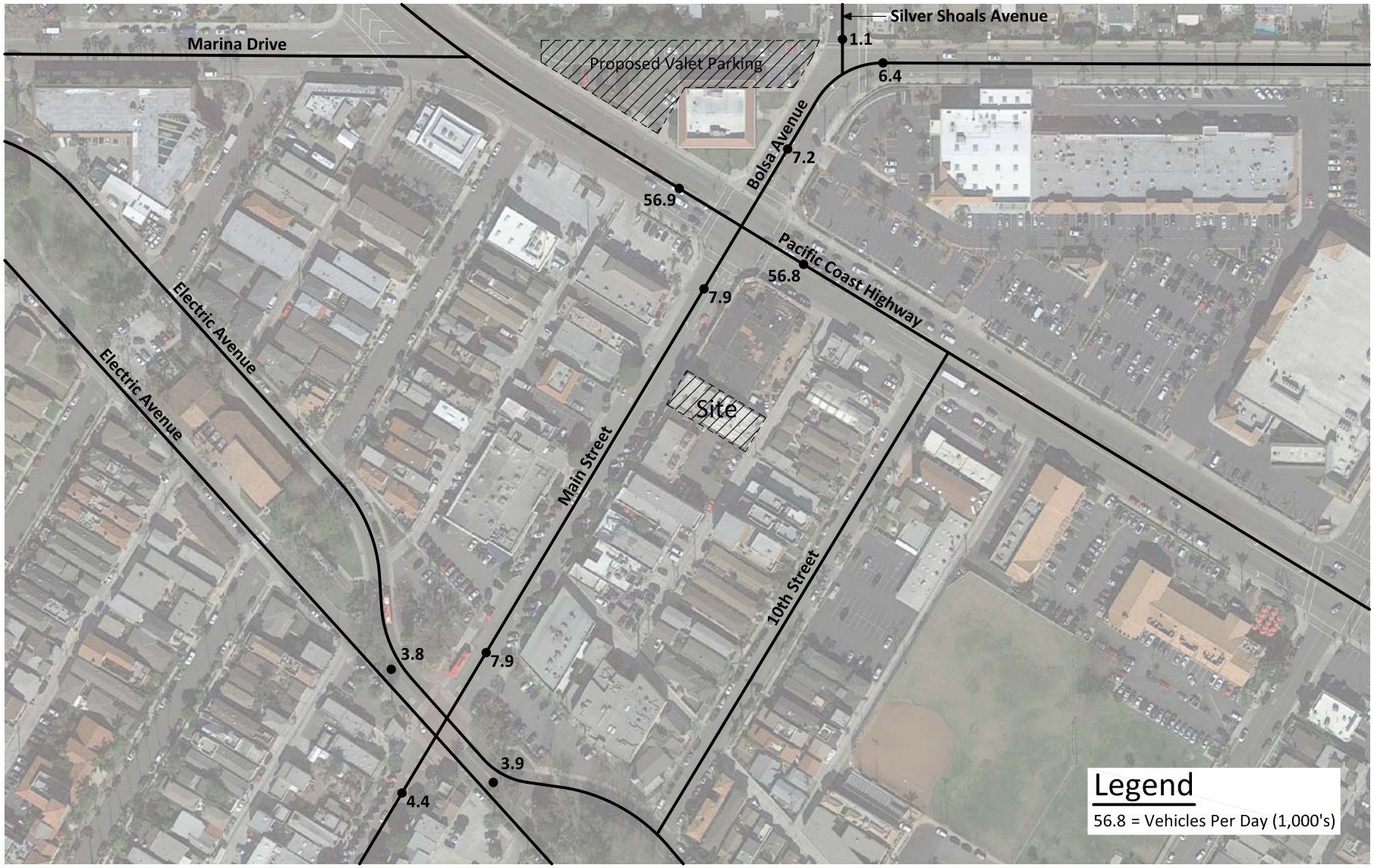

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Figure 27
Buildout With Project Plus Cumulative Average Daily Traffic Volumes

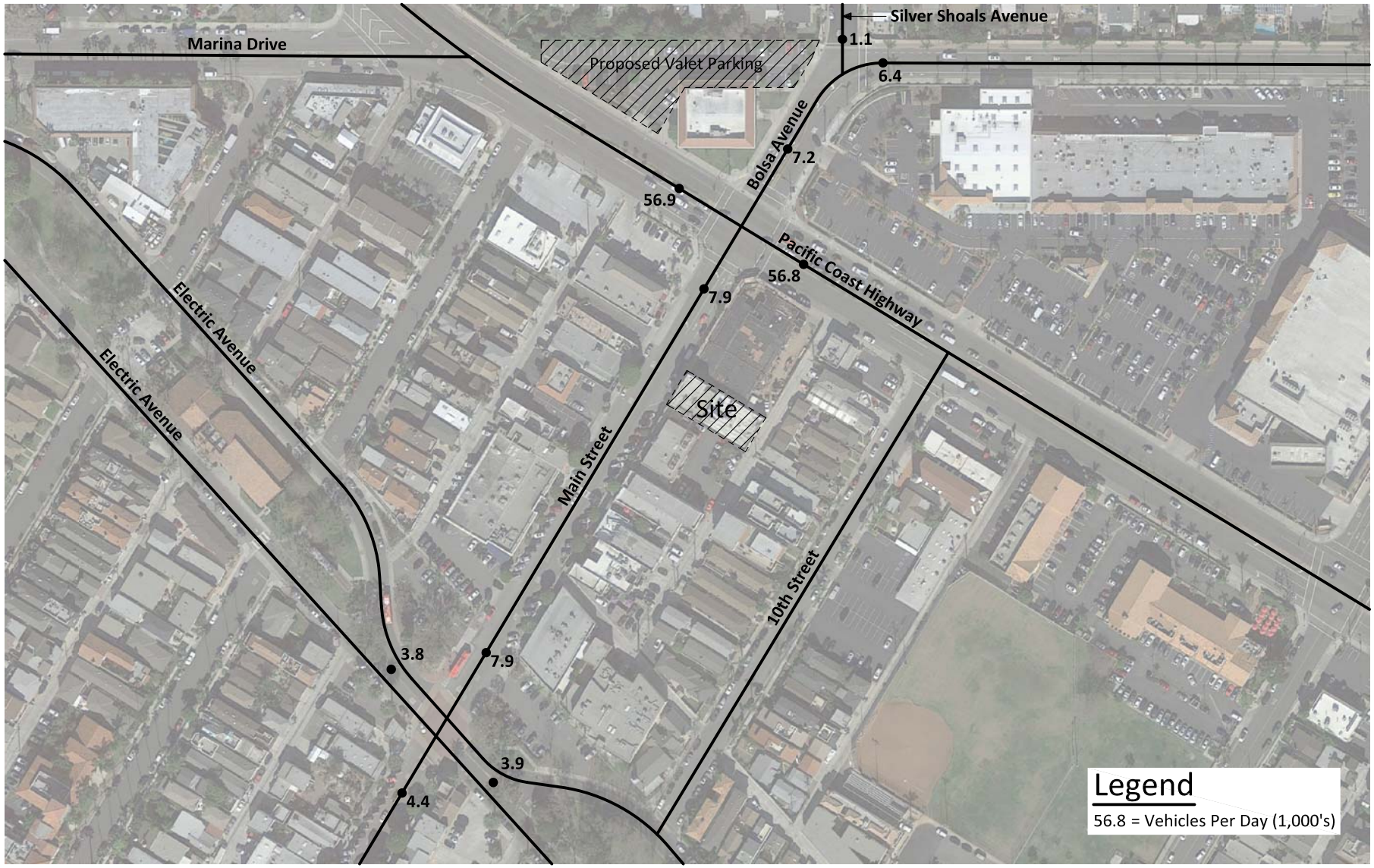

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Figure 28
Existing Plus Project
Evening Peak Hour Intersection Turning Movement Volumes

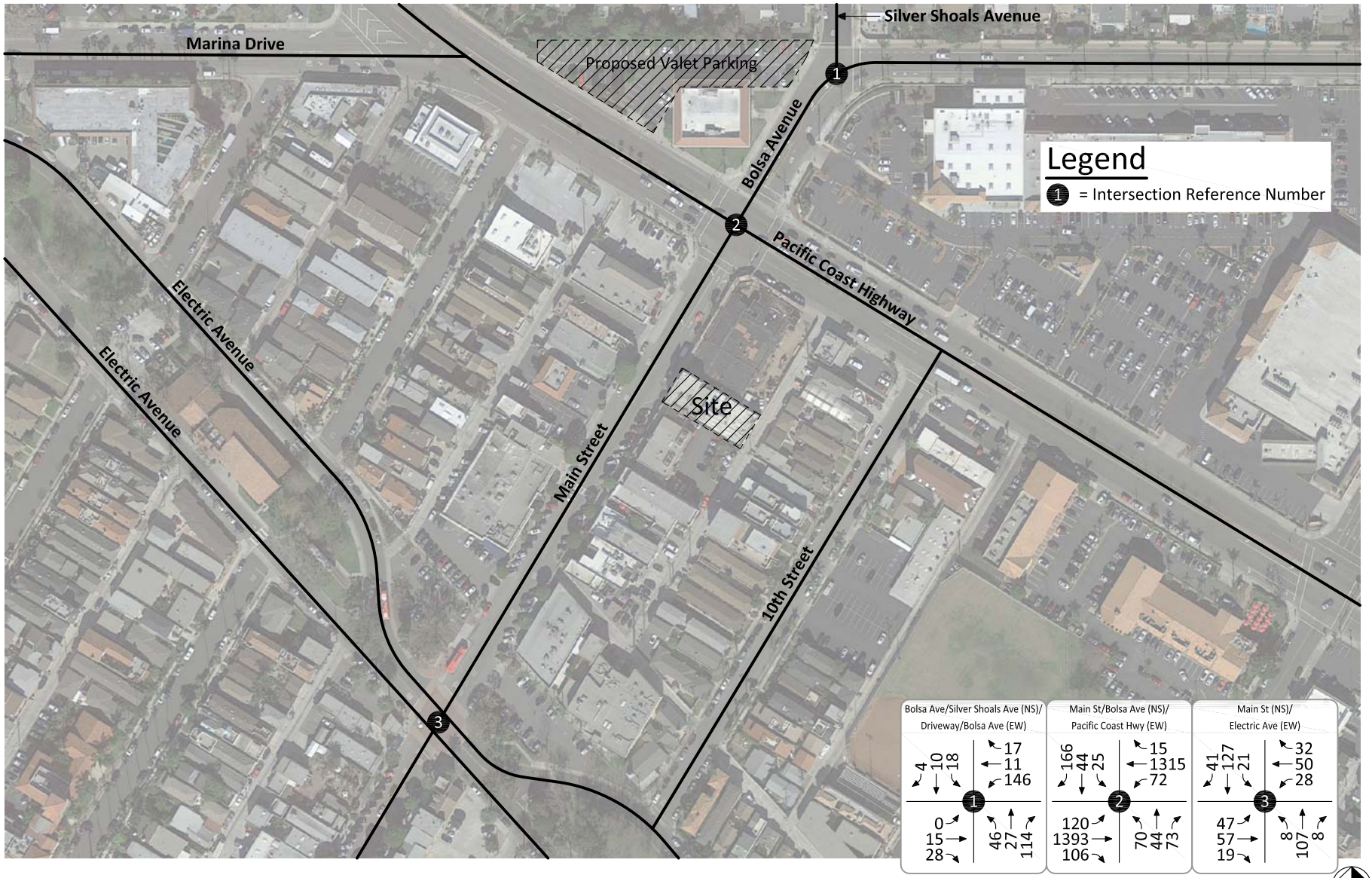

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Figure 29
Existing Plus Project Plus Cumulative
Evening Peak Hour Intersection Turning Movement Volumes

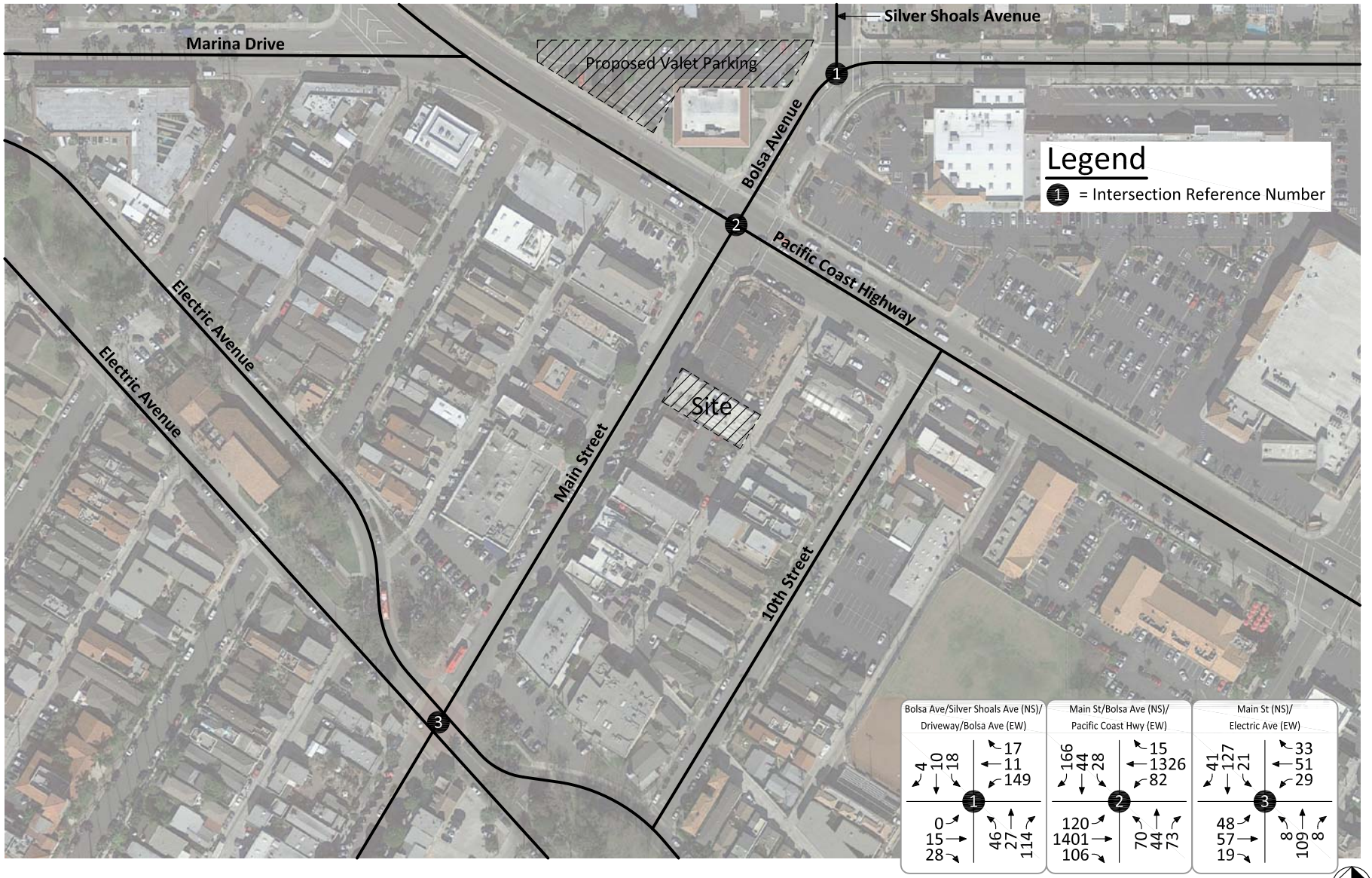

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Figure 30
Opening Year (2017) Without Project
Evening Peak Hour Intersection Turning Movement Volumes

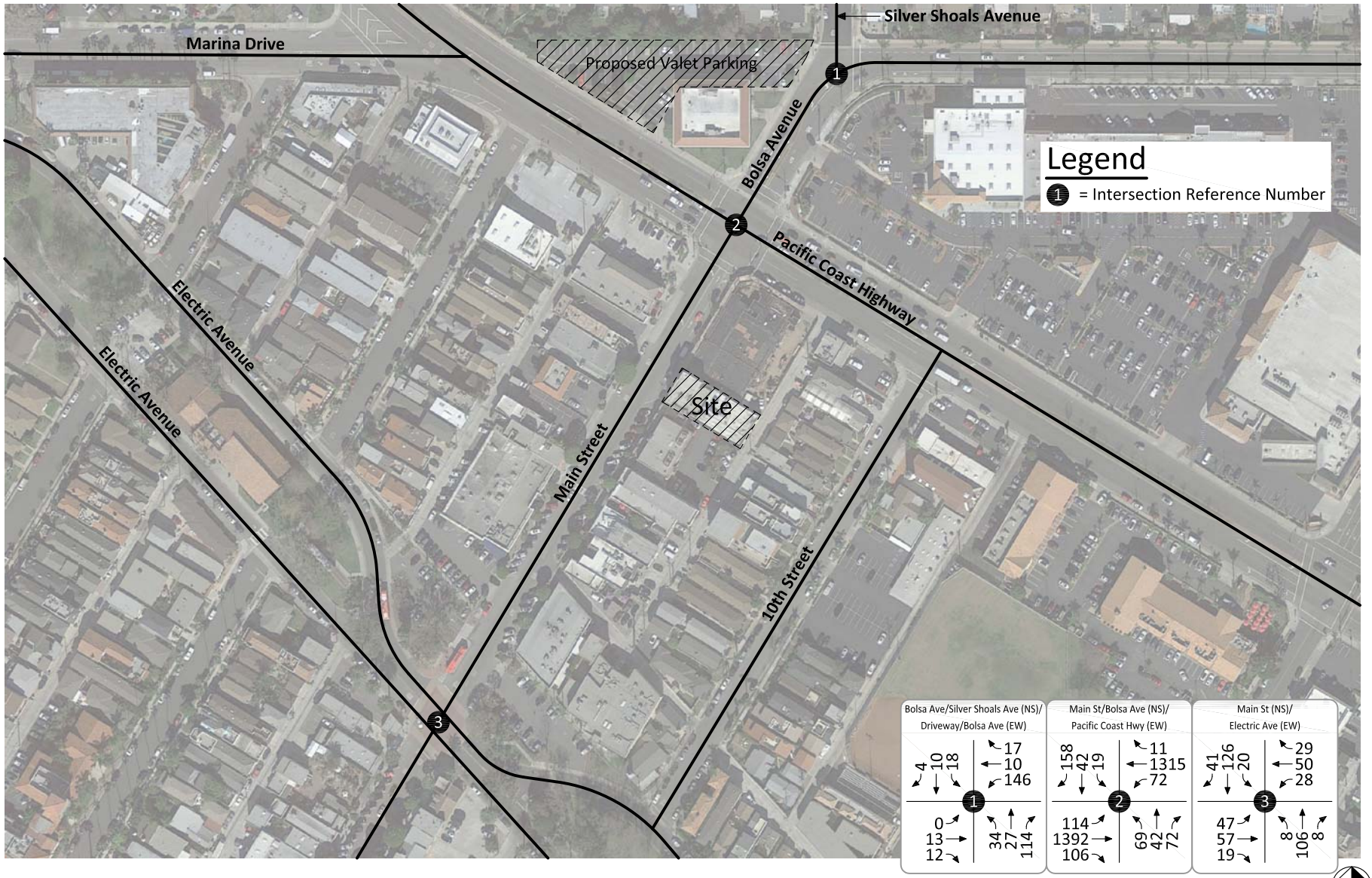

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Figure 31
Opening Year (2017) With Project
Evening Peak Hour Intersection Turning Movement Volumes

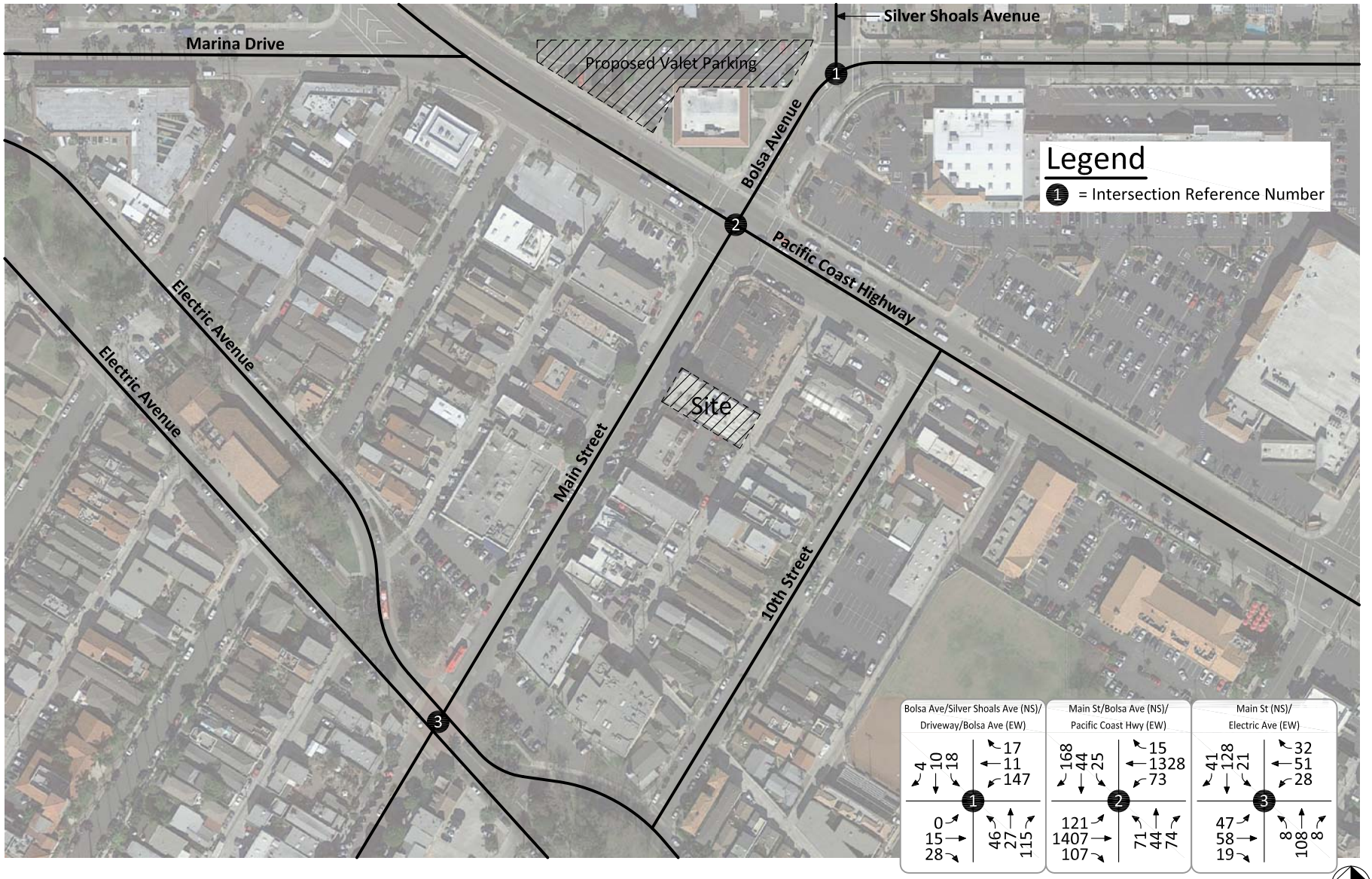

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Figure 32
Opening Year (2017) With Project Plus Cumulative Evening Peak Hour Intersection Turning Movement Volumes

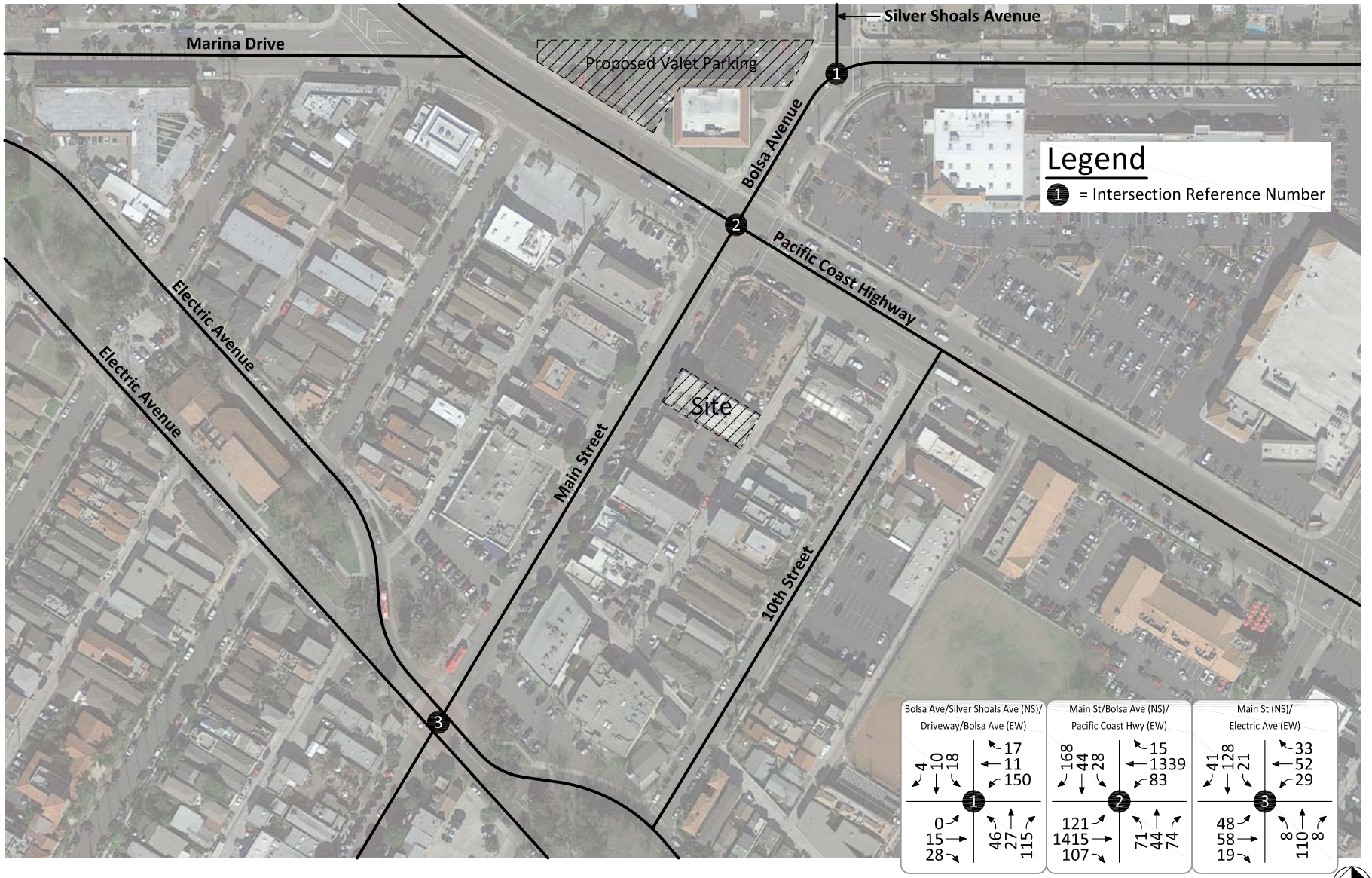

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Figure 33
Buildout Without Project
Evening Peak Hour Intersection Turning Movement Volumes

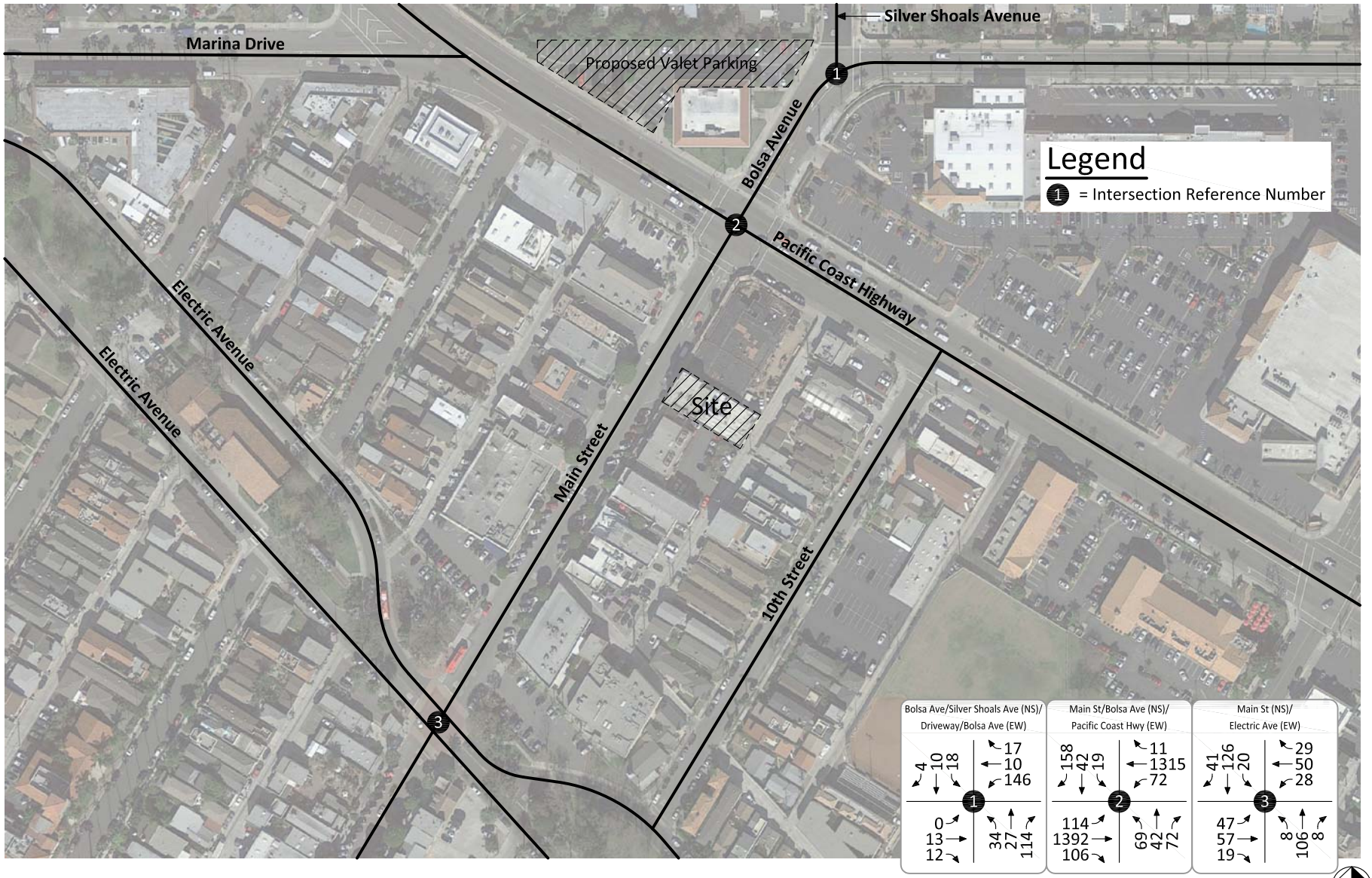

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Figure 34
Buildout With Project
Evening Peak Hour Intersection Turning Movement Volumes

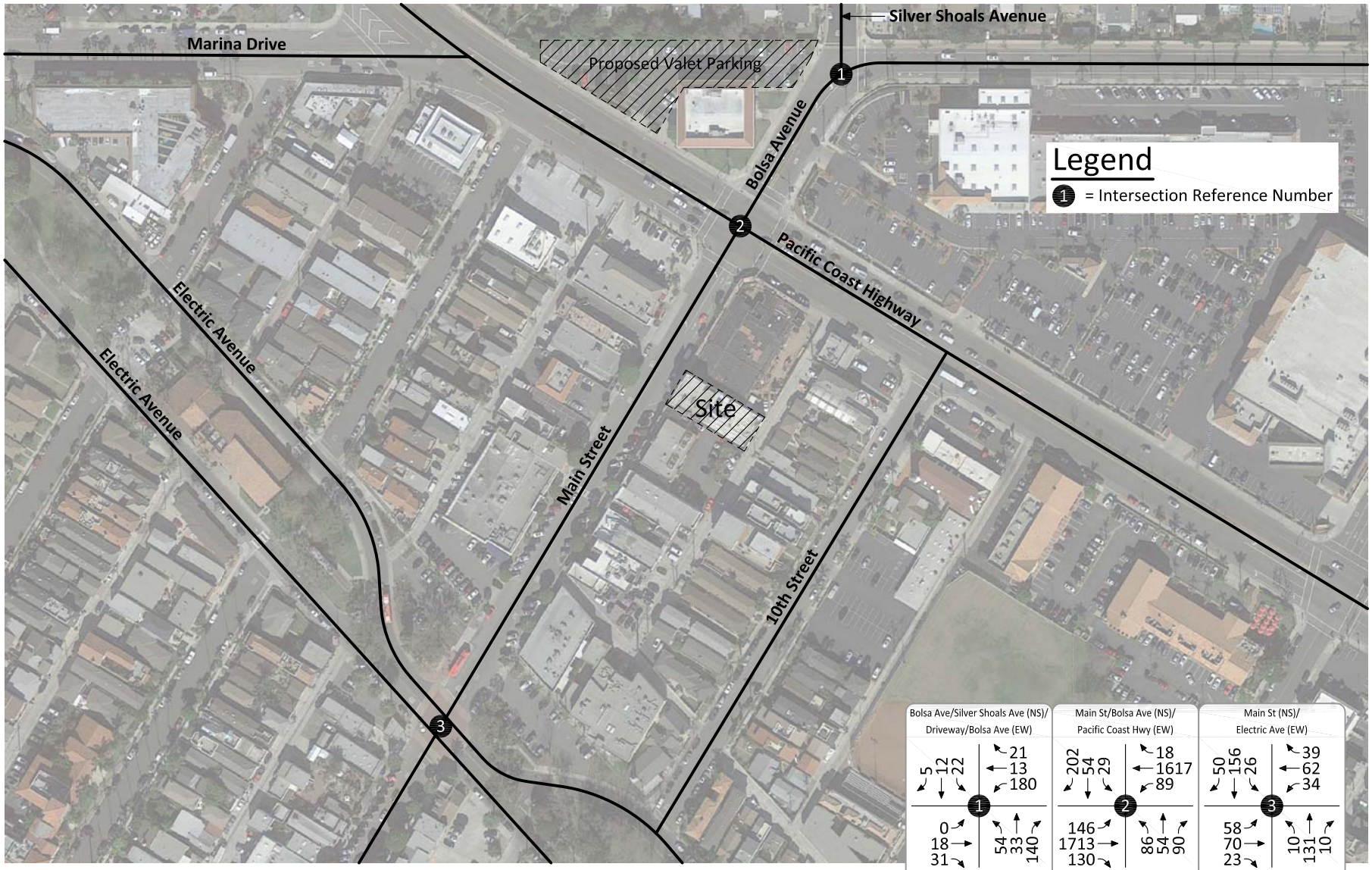

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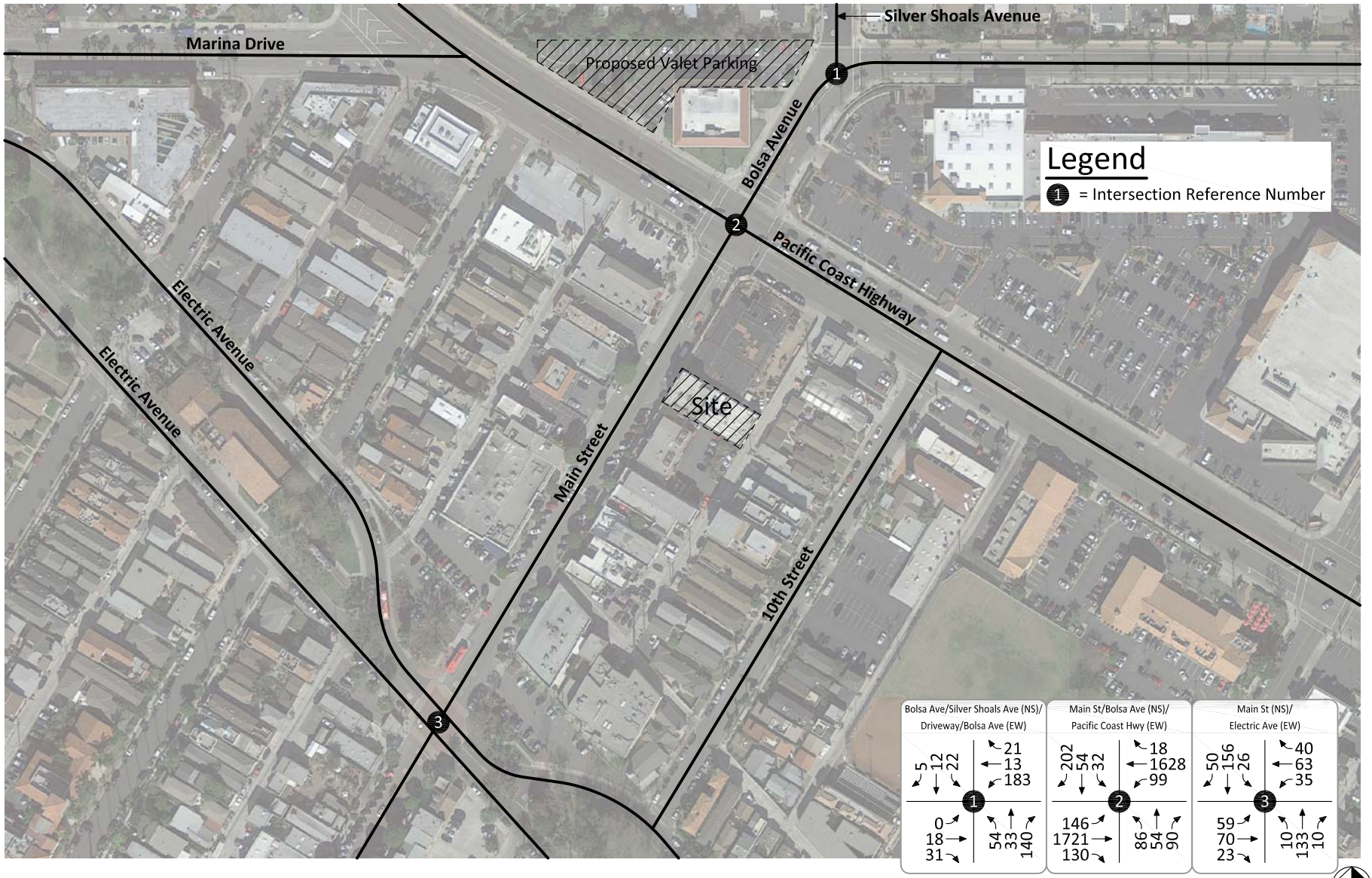
Figure 35
Buildout With Project Plus Cumulative
Evening Peak Hour Intersection Turning Movement Volumes



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VII. OTHER TRAFFIC CONSIDERATIONS

A. Parking

The City of Seal Beach's Main Street Specific Plan (see Appendix E) outlines parking regulations for the project area. The Specific Plan requires movie theaters to provide one parking space for every six seats. The reconfigured theater is proposed to have up to 475 seats. This results in a requirement of 80 parking spaces (475 / 6 = 79.2).

Because of the level of development in the project area and a lack of space to provide on-site parking, off-site parking must be provided. Currently, Main Street provides parallel and diagonal on-street parking adjacent to the project site.

The project applicant is currently negotiating with the property owner at 801 Pacific Coast Highway, which is currently occupied by a bank. This site is proposed to be used to store vehicles from valet parking to be provided at the existing lot. The bank currently has 55 parking spaces, which would be available after bank hours (after 6:00 PM Monday thru Friday, after 4:00 PM Saturday, and all day Sunday). It is estimated that valet parking would allow approximately 20 percent more cars to be parked at this location. This would result in a capacity of approximately 66 parked vehicles.

In addition, there are several city owned metered lots in the project vicinity, as shown on Figure 36. Seal Beach Municipal Code 8.15.105 Section B states that parking meters in the parking meter zones shall be operated between the hours of 8:00 AM and 6:00 PM on every day unless otherwise indicated by signs at a particular zone. The two lots closest to the project site are at the northwest and northeast corners of the intersection of Main Street and Electric Avenue. These two lots are free after 6:00 PM.

There are also 425 parking spaces available at the City owned beach lots, approximately 1/3 mile south of the project site. These lots are often underutilized during evening hours, when the theater would be busiest. The beach lots are available for pay parking from 6:00 AM to 10:00 PM every day.

It is estimated that 10% to 20% of persons attending the theater will walk to the site. Pedestrian facilities in the project area are shown on Figure 10.

If a parking agreement is secured with the bank property at 801 Pacific Coast Highway, the project will only need 14 additional spaces to meet the City's parking requirements. During the peak period of project operation, the City's metered parking lots, beach lots, and on-street parking have sufficient spaces available to accommodate the additional 14 vehicles.

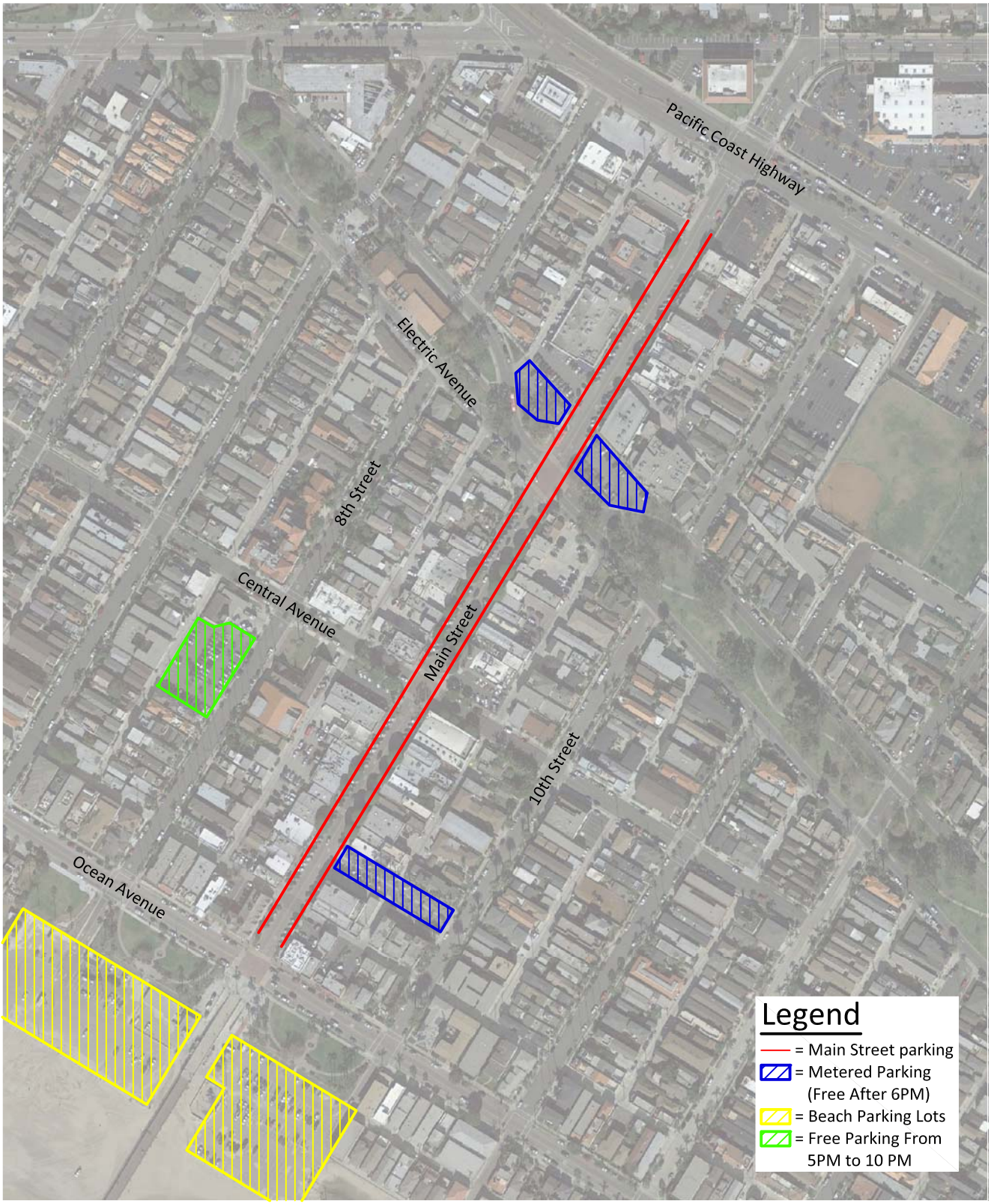
The project is expected to have sufficient parking. The availability of pedestrian and transit options will further reduce parking demand.

B. **Drop-off**

This sections evaluates the required space needed to accommodate passenger loading curbside at the theater.

The project is projected to generate 219 trips during the busiest hour on a Saturday. Assuming that 10% of these trips will be drop-off trips, the passenger loading area will need to accommodate approximately 11 vehicles during the peak hour. Because movie-theater drop-offs will likely be condensed into a smaller period, this analysis assumed 11 vehicles would need to be accommodated in a 20 minute timeframe. This results in a projected vehicle arrival approximately every 1.8 minutes. Most drop-offs will take under one minute. To accommodate two vehicles arriving simultaneously, it sis recommended that space for two vehicles be provided. This can be accomplished by providing two angled parking spaces or 50 linear feet of painted curb space for loading.

Figure 36
Public Parking



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VIII. RECOMMENDATIONS

A. Site Access and Parking

If a parking agreement is secured with the bank property at 801 Pacific Coast Highway, the project will only need 14 additional spaces to meet the City's parking requirements. During the peak period of project operation, the City's metered parking lots, beach lots, and on-street parking have sufficient spaces available to accommodate the additional 14 vehicles.

The project is expected to have sufficient parking. The availability of pedestrian and transit options will further reduce parking demand.

To accommodate two drop-off vehicles arriving simultaneously, it is recommended that space for two vehicles be provided. This can be accomplished by providing two angled parking spaces or 50 linear feet of painted curb space for loading.

B. Roadway Improvements

As is the case for any roadway design, the City of Seal Beach should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

APPENDICES

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Explanation and Calculation of Intersection Capacity Utilization/Delay

Appendix D – Orange County Transportation Analysis Model Plots

Appendix E – City of Seal Beach Main Street Specific Plan

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Traffic Count Worksheets

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Seal Beach
N/S: Silver Shoals Avenue/Bolsa Avenue
E/W: Bolsa Avenue
Weather: Clear

File Name : SBHSIBOPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 1

Groups Printed- Total Volume

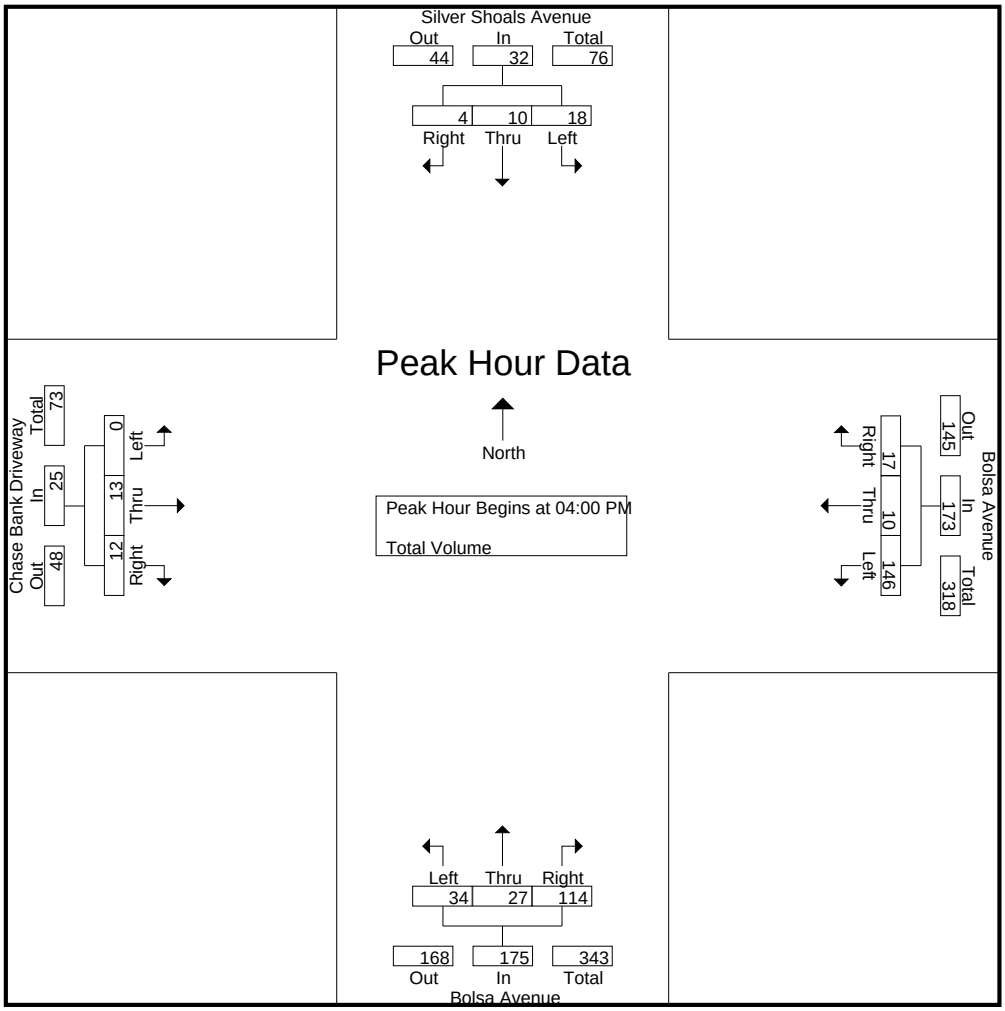
	Silver Shoals Avenue Southbound				Bolsa Avenue Westbound				Bolsa Avenue Northbound				Chase Bank Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	1	1	7	39	6	5	50	13	6	18	37	0	6	4	10	104
04:15 PM	7	3	0	10	40	1	4	45	6	6	39	51	0	3	0	3	109
04:30 PM	3	3	2	8	24	1	1	26	9	10	32	51	0	1	3	4	89
04:45 PM	3	3	1	7	43	2	7	52	6	5	25	36	0	3	5	8	103
Total	18	10	4	32	146	10	17	173	34	27	114	175	0	13	12	25	405
05:00 PM	1	2	1	4	38	3	3	44	6	1	19	26	0	3	1	4	78
05:15 PM	0	3	0	3	35	2	6	43	8	6	27	41	3	3	5	11	98
05:30 PM	2	1	2	5	22	0	4	26	5	5	22	32	1	1	4	6	69
05:45 PM	1	2	0	3	21	2	2	25	4	2	30	36	0	0	2	2	66
Total	4	8	3	15	116	7	15	138	23	14	98	135	4	7	12	23	311
Grand Total	22	18	7	47	262	17	32	311	57	41	212	310	4	20	24	48	716
Apprch %	46.8	38.3	14.9		84.2	5.5	10.3		18.4	13.2	68.4		8.3	41.7	50		
Total %	3.1	2.5	1	6.6	36.6	2.4	4.5	43.4	8	5.7	29.6	43.3	0.6	2.8	3.4	6.7	

	Silver Shoals Avenue Southbound				Bolsa Avenue Westbound				Bolsa Avenue Northbound				Chase Bank Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	5	1	1	7	39	**6**	5	50	**13**	6	18	37	0	**6**	4	**10**	104
04:15 PM	**7**	**3**	0	**10**	40	1	4	45	6	6	**39**	**51**	0	3	0	3	**109**
04:30 PM	3	3	**2**	8	24	1	1	26	9	**10**	32	51	0	1	3	4	89
04:45 PM	3	3	1	7	**43**	2	**7**	**52**	6	5	25	36	0	3	**5**	8	103
Total Volume	18	10	4	32	146	10	17	173	34	27	114	175	0	13	12	25	405
% App. Total	56.2	31.2	12.5		84.4	5.8	9.8		19.4	15.4	65.1		0	52	48		
PHF	.643	.833	.500	.800	.849	.417	.607	.832	.654	.675	.731	.858	.000	.542	.600	.625	.929

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Seal Beach
N/S: Silver Shoals Avenue/Bolsa Avenue
E/W: Bolsa Avenue
Weather: Clear

File Name : SBHSIBOPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	5	1	1	7	39	**6**	5	50	**13**	6	18	37	0	**3**	**5**	8
+15 mins.	**7**	**3**	0	**10**	40	1	4	45	6	6	**39**	**51**	0	3	1	4
+30 mins.	3	3	**2**	8	24	1	1	26	9	**10**	32	51	**3**	3	5	**11**
+45 mins.	3	3	1	7	**43**	2	**7**	**52**	6	5	25	36	1	1	4	6
Total Volume	18	10	4	32	146	10	17	173	34	27	114	175	4	10	15	29
% App. Total	56.2	31.2	12.5		84.4	5.8	9.8		19.4	15.4	65.1		13.8	34.5	51.7	
PHF	.643	.833	.500	.800	.849	.417	.607	.832	.654	.675	.731	.858	.333	.833	.750	.659

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Seal Beach
N/S: Bolsa Avenue/Main Street
E/W: Pacific Coast Highway
Weather: Clear

File Name : SBHMAPCHPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 1

Groups Printed- Total Volume

	Bolsa Avenue Southbound				Pacific Coast Highway Westbound				Main Street Northbound				Pacific Coast Highway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	11	43	59	18	296	10	324	19	12	19	50	30	315	21	366	799
04:15 PM	2	12	38	52	19	296	5	320	15	18	13	46	36	316	21	373	791
04:30 PM	5	8	29	42	16	329	4	349	16	17	15	48	34	335	26	395	834
04:45 PM	8	16	50	74	22	305	2	329	17	10	23	50	32	338	30	400	853
Total	20	47	160	227	75	1226	21	1322	67	57	70	194	132	1304	98	1534	3277
05:00 PM	2	10	36	48	13	350	1	364	16	13	17	46	30	330	20	380	838
05:15 PM	4	13	44	61	17	329	3	349	22	12	14	48	29	360	22	411	869
05:30 PM	5	3	28	36	20	331	5	356	14	7	18	39	23	364	34	421	852
05:45 PM	7	7	22	36	18	324	4	346	12	11	21	44	29	292	24	345	771
Total	18	33	130	181	68	1334	13	1415	64	43	70	177	111	1346	100	1557	3330
Grand Total	38	80	290	408	143	2560	34	2737	131	100	140	371	243	2650	198	3091	6607
Apprch %	9.3	19.6	71.1		5.2	93.5	1.2		35.3	27	37.7		7.9	85.7	6.4		
Total %	0.6	1.2	4.4	6.2	2.2	38.7	0.5	41.4	2	1.5	2.1	5.6	3.7	40.1	3	46.8	

	Bolsa Avenue Southbound				Pacific Coast Highway Westbound				Main Street Northbound				Pacific Coast Highway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**8**	**16**	**50**	**74**	**22**	305	2	329	17	10	**23**	**50**	**32**	338	30	400	853
05:00 PM	2	10	36	48	13	**350**	1	**364**	16	**13**	17	46	30	330	20	380	838
05:15 PM	4	13	44	61	17	329	3	349	**22**	12	14	48	29	360	22	411	**869**
05:30 PM	5	3	28	36	20	331	**5**	356	14	7	18	39	23	**364**	**34**	**421**	852
Total Volume	19	42	158	219	72	1315	11	1398	69	42	72	183	114	1392	106	1612	3412
% App. Total	8.7	19.2	72.1		5.2	94.1	0.8		37.7	23	39.3		7.1	86.4	6.6		
PHF	.594	.656	.790	.740	.818	.939	.550	.960	.784	.808	.783	.915	.891	.956	.779	.957	.982

Counts Unlimited
PO Box 1178
Corona, CA 92878
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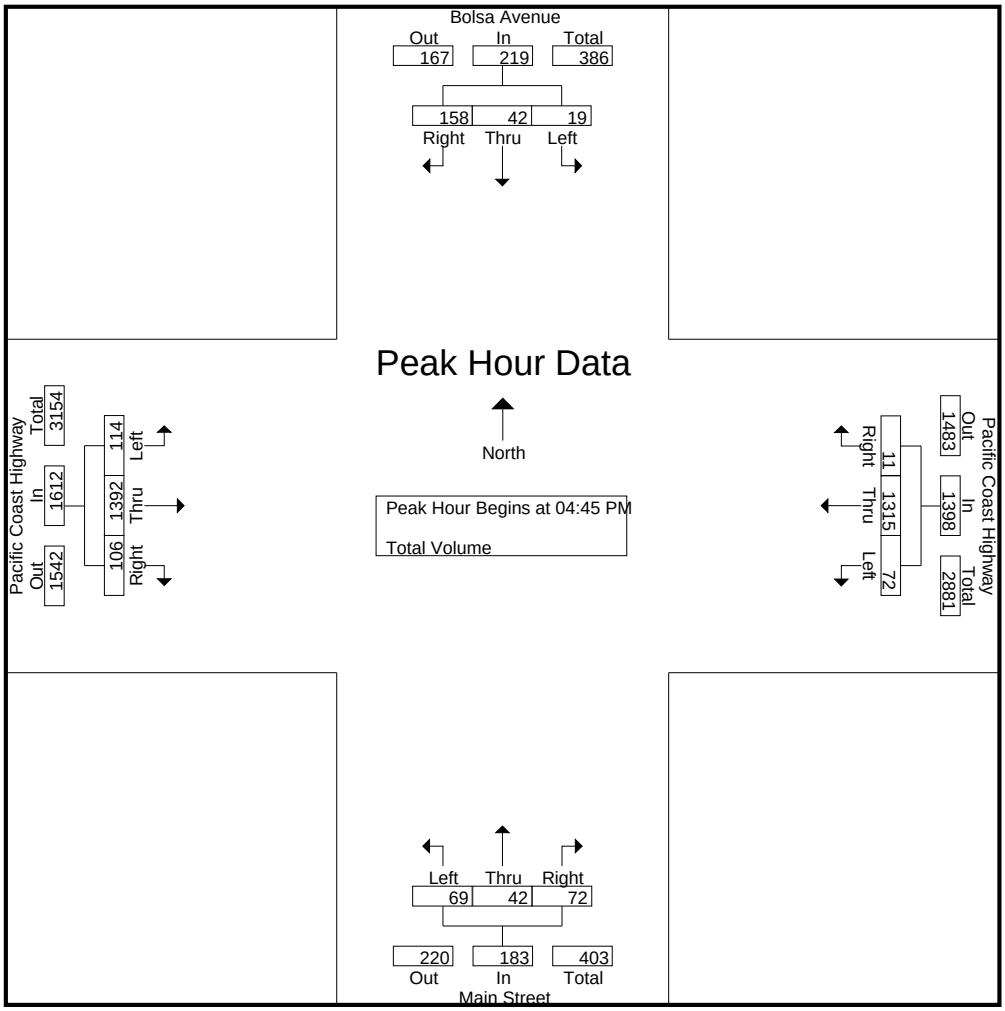
City of Seal Beach
N/S: Bolsa Avenue/Main Street
E/W: Pacific Coast Highway
Weather: Clear

File Name : SBHMAPCHPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:45 PM			
+0 mins.	5	11	43	59	13	**350**	1	**364**	**19**	12	19	**50**	**32**	338	30	400
+15 mins.	2	12	38	52	17	329	3	349	15	**18**	13	46	30	330	20	380
+30 mins.	5	8	29	42	**20**	331	**5**	356	16	17	15	48	29	360	22	411
+45 mins.	**8**	**16**	**50**	**74**	18	324	4	346	17	10	**23**	50	23	**364**	**34**	**421**
Total Volume	20	47	160	227	68	1334	13	1415	67	57	70	194	114	1392	106	1612
% App. Total	8.8	20.7	70.5		4.8	94.3	0.9		34.5	29.4	36.1		7.1	86.4	6.6	
PHF	.625	.734	.800	.767	.850	.953	.650	.972	.882	.792	.761	.970	.891	.956	.779	.957

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Seal Beach
N/S: Main Street
E/W: Electric Avenue
Weather: Clear

File Name : SBHMAELPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 1

Groups Printed- Total Volume

	Main Street Southbound				Electric Avenue Westbound				Main Street Northbound				Electric Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	30	8	42	7	10	6	23	1	34	3	38	9	14	4	27	130
04:15 PM	10	32	9	51	11	10	10	31	2	25	2	29	11	18	4	33	144
04:30 PM	1	32	11	44	6	21	7	34	2	24	1	27	14	12	8	34	139
04:45 PM	5	32	13	50	4	9	6	19	3	23	2	28	13	13	3	29	126
Total	20	126	41	187	28	50	29	107	8	106	8	122	47	57	19	123	539
05:00 PM	5	32	10	47	5	12	4	21	2	27	4	33	8	11	3	22	123
05:15 PM	3	34	6	43	9	8	10	27	2	22	1	25	9	12	2	23	118
05:30 PM	2	35	3	40	5	10	4	19	1	30	0	31	4	13	6	23	113
05:45 PM	6	34	5	45	8	8	1	17	0	20	2	22	8	15	6	29	113
Total	16	135	24	175	27	38	19	84	5	99	7	111	29	51	17	97	467
Grand Total	36	261	65	362	55	88	48	191	13	205	15	233	76	108	36	220	1006
Apprch %	9.9	72.1	18		28.8	46.1	25.1		5.6	88	6.4		34.5	49.1	16.4		
Total %	3.6	25.9	6.5	36	5.5	8.7	4.8	19	1.3	20.4	1.5	23.2	7.6	10.7	3.6	21.9	

	Main Street Southbound				Electric Avenue Westbound				Main Street Northbound				Electric Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	30	8	42	7	10	6	23	1	**34**	**3**	**38**	9	14	4	27	130
04:15 PM	**10**	**32**	9	**51**	**11**	10	**10**	31	2	25	2	29	11	**18**	4	33	**144**
04:30 PM	1	32	11	44	6	**21**	7	**34**	2	24	1	27	**14**	12	**8**	**34**	139
04:45 PM	5	32	**13**	50	4	9	6	19	**3**	23	2	28	13	13	3	29	126
Total Volume	20	126	41	187	28	50	29	107	8	106	8	122	47	57	19	123	539
% App. Total	10.7	67.4	21.9		26.2	46.7	27.1		6.6	86.9	6.6		38.2	46.3	15.4		
PHF	.500	.984	.788	.917	.636	.595	.725	.787	.667	.779	.667	.803	.839	.792	.594	.904	.936

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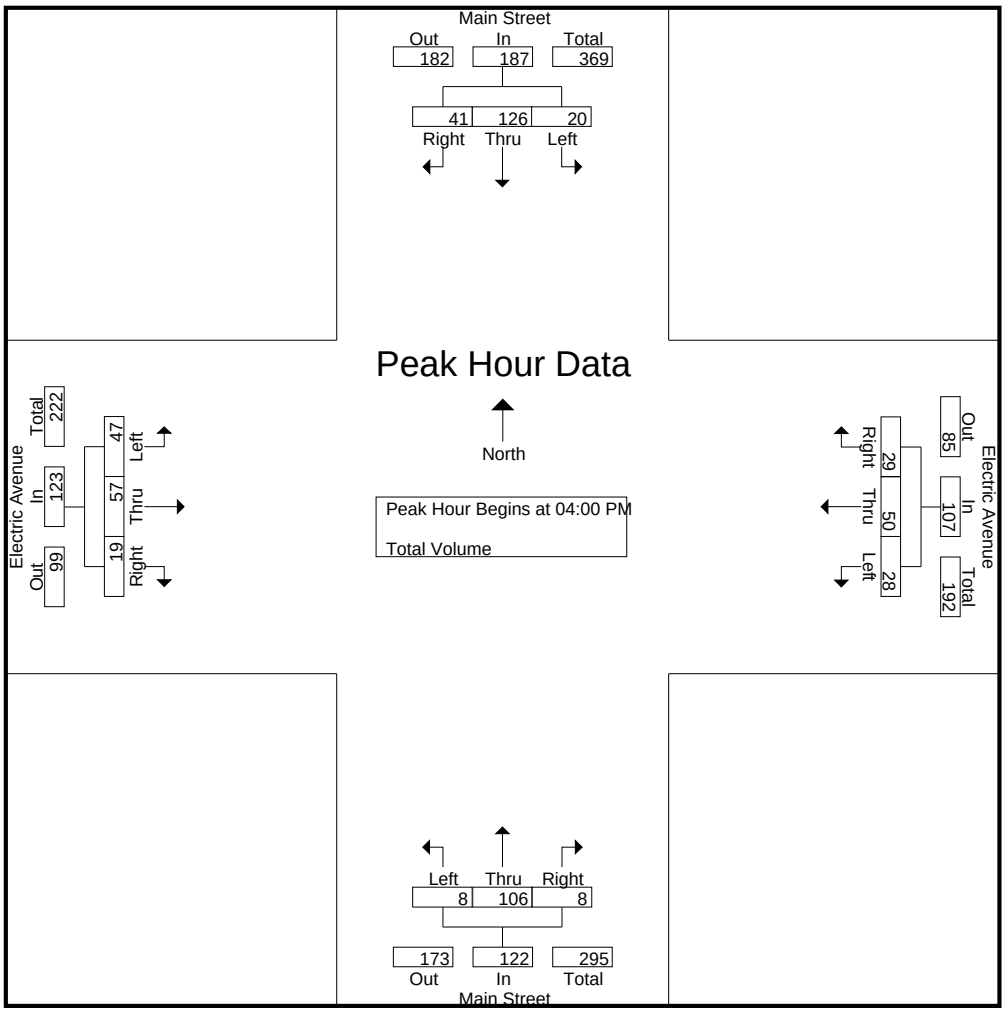
City of Seal Beach
N/S: Main Street
E/W: Electric Avenue
Weather: Clear

File Name : SBHMAELPM
Site Code : 07516662
Start Date : 12/6/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	**10**	**32**	9	**51**	7	10	6	23	1	**34**	**3**	**38**	9	14	4	27
+15 mins.	1	32	11	44	**11**	10	**10**	31	2	25	2	29	11	**18**	4	33
+30 mins.	5	32	**13**	50	6	**21**	7	**34**	2	24	1	27	**14**	12	**8**	**34**
+45 mins.	5	32	10	47	4	9	6	19	**3**	23	2	28	13	13	3	29
Total Volume	21	128	43	192	28	50	29	107	8	106	8	122	47	57	19	123
% App. Total	10.9	66.7	22.4		26.2	46.7	27.1		6.6	86.9	6.6		38.2	46.3	15.4	
PHF	.525	1.000	.827	.941	.636	.595	.725	.787	.667	.779	.667	.803	.839	.792	.594	.904

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Seal Beach
Bolsa Avenue
B/ Pacific Coast Highway - Silver Shoals Avenue
24 Hour Directional Volume Count

SBH004
Site Code: 075-16662

Start Time	12/15/2016 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		1	71			1	41				
12:15		0	58			0	36				
12:30		3	57			2	35				
12:45		0	67	4	253	2	42	5	154	9	407
01:00		2	71			0	37				
01:15		0	**82**			1	52				
01:30		0	**88**			0	35				
01:45		4	**103**	6	344	2	30	3	154	9	498
02:00		0	**75**			0	42				
02:15		0	43			1	47				
02:30		0	54			1	40				
02:45		0	79	0	251	0	55	2	184	2	435
03:00		0	85			0	40				
03:15		0	62			1	54				
03:30		0	55			1	40				
03:45		3	63	3	265	1	45	3	179	6	444
04:00		0	63			0	49				
04:15		0	80			3	46				
04:30		2	54			1	**60**				
04:45		5	67	7	264	6	**40**	10	195	17	459
05:00		4	44			8	**62**				
05:15		3	50			6	**50**				
05:30		2	54			5	35				
05:45		4	40	13	188	7	46	26	193	39	381
06:00		7	57			13	34				
06:15		22	43			8	31				
06:30		18	25			12	27				
06:45		29	42	76	167	23	25	56	117	132	284
07:00		43	25			26	23				
07:15		59	31			31	14				
07:30		60	23			45	16				
07:45		27	25	189	104	31	15	133	68	322	172
08:00		31	26			19	15				
08:15		28	15			36	15				
08:30		30	25			32	17				
08:45		55	16	144	82	39	15	126	62	270	144
09:00		40	23			24	6				
09:15		33	10			31	2				
09:30		41	21			31	9				
09:45		40	11	154	65	27	3	113	20	267	85
10:00		41	12			29	4				
10:15		**70**	4			23	5				
10:30		**83**	6			25	3				
10:45		**56**	0	250	22	**42**	4	119	16	369	38
11:00		**62**	2			**39**	3				
11:15		59	2			**54**	3				
11:30		47	5			**53**	0				
11:45		61	0	229	9	36	3	182	9	411	18
Total		1075	2014	1075	2014	778	1351	778	1351	1853	3365
Combined Total		3089		3089		2129		2129		5218	
AM Peak	-	10:15	-	-	-	10:45	-	-	-	-	-
Vol.	-	271	-	-	-	188	-	-	-	-	-
P.H.F.		0.816				0.870					
PM Peak	-	-	01:15	-	-	-	04:30	-	-	-	-
Vol.	-	-	348	-	-	-	212	-	-	-	-
P.H.F.			0.845				0.855				
Percentage		34.8%	65.2%			36.5%	63.5%				
ADT/AADT		ADT 5,218		AADT 5,218							

Counts Unlimited, Inc.

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email: counts@countsunlimited.com

City of Seal Beach
Main Street
B/ Electric Avenue - Pacific Coast Highway
24 Hour Directional Volume Count

SBH003
Site Code: 075-16662

Start Time	12/15/2016 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		3	66			3	**76**				
12:15		3	70			2	**60**				
12:30		1	62			4	**54**				
12:45		3	**65**	10	263	1	**59**	10	249	20	512
01:00		0	**81**			2	69				
01:15		2	**73**			1	50				
01:30		0	**69**			2	71				
01:45		3	62	5	285	0	52	5	242	10	527
02:00		0	50			2	66				
02:15		0	59			0	47				
02:30		0	61			5	58				
02:45		4	60	4	230	0	58	7	229	11	459
03:00		1	59			2	61				
03:15		2	68			3	52				
03:30		2	47			2	57				
03:45		6	46	11	220	1	49	8	219	19	439
04:00		1	51			4	65				
04:15		7	47			7	58				
04:30		4	56			5	45				
04:45		6	54	18	208	14	57	30	225	48	433
05:00		18	51			12	50				
05:15		6	39			13	61				
05:30		10	39			9	46				
05:45		16	43	50	172	3	59	37	216	87	388
06:00		22	34			13	53				
06:15		19	37			25	45				
06:30		29	35			16	47				
06:45		33	29	103	135	25	51	79	196	182	331
07:00		36	23			28	38				
07:15		35	36			34	26				
07:30		45	40			25	23				
07:45		43	50	159	149	28	22	115	109	274	258
08:00		43	41			34	28				
08:15		24	35			42	17				
08:30		43	33			43	15				
08:45		28	35	138	144	36	20	155	80	293	224
09:00		44	19			45	23				
09:15		47	13			59	12				
09:30		57	24			46	22				
09:45		49	16	197	72	49	16	199	73	396	145
10:00		56	17			48	11				
10:15		51	14			65	10				
10:30		51	13			**83**	4				
10:45		**69**	6	227	50	**80**	4	276	29	503	79
11:00		**62**	6			**72**	5				
11:15		**59**	4			**78**	5				
11:30		**64**	6			65	7				
11:45		64	4	249	20	78	6	293	23	542	43
Total		1171	1948	1171	1948	1214	1890	1214	1890	2385	3838
Combined Total		3119		3119		3104		3104		6223	
AM Peak	-	10:45	-	-	-	10:30	-	-	-	-	-
Vol.	-	254	-	-	-	313	-	-	-	-	-
P.H.F.		0.920				0.943					
PM Peak	-	-	00:45	-	-	-	12:00	-	-	-	-
Vol.	-	-	288	-	-	-	249	-	-	-	-
P.H.F.			0.889				0.819				
Percentage		37.5%	62.5%			39.1%	60.9%				

ADT/AADT	ADT 6,223	AADT 6,223

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Seal Beach
Pacific Coast Highway
B/ Marina Drive - Main Street
24 Hour Directional Volume Count

SBH001A
Site Code: 075-16662

Start Time	12/20/2016 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		15	249			29	269				
12:15		24	274			22	199				
12:30		21	285			22	279				
12:45		7	296	67	1104	15	264	88	1011	155	2115
01:00		7	237			15	235				
01:15		10	259			11	258				
01:30		9	291			11	253				
01:45		10	322	36	1109	13	261	50	1007	86	2116
02:00		6	271			10	237				
02:15		7	279			13	248				
02:30		9	277			8	265				
02:45		16	310	38	1137	8	324	39	1074	77	2211
03:00		13	310			12	284				
03:15		11	307			6	286				
03:30		6	317			9	281				
03:45		10	317	40	1251	10	328	37	1179	77	2430
04:00		18	342			16	355				
04:15		20	317			16	293				
04:30		26	**360**			21	344				
04:45		45	**346**	109	1365	35	390	88	1382	197	2747
05:00		39	**369**			56	380				
05:15		63	**393**			71	396				
05:30		91	334			92	**425**				
05:45		129	310	322	1406	99	**383**	318	1584	640	2990
06:00		215	301			125	**418**				
06:15		266	264			181	**416**				
06:30		317	241			199	424				
06:45		**369**	206	1167	1012	241	364	746	1622	1913	2634
07:00		**352**	185			261	241				
07:15		**360**	170			**314**	239				
07:30		**320**	183			**310**	282				
07:45		316	168	1348	706	**366**	171	1251	933	2599	1639
08:00		301	146			**357**	157				
08:15		286	126			292	143				
08:30		306	135			308	135				
08:45		248	124	1141	531	238	146	1195	581	2336	1112
09:00		251	122			228	152				
09:15		242	101			210	124				
09:30		239	105			229	104				
09:45		225	93	957	421	213	132	880	512	1837	933
10:00		201	67			174	103				
10:15		224	86			213	105				
10:30		246	66			243	85				
10:45		257	46	928	265	218	77	848	370	1776	635
11:00		223	61			218	84				
11:15		259	32			277	58				
11:30		229	42			270	55				
11:45		238	42	949	177	257	48	1022	245	1971	422
Total		7102	10484	7102	10484	6562	11500	6562	11500	13664	21984
Combined Total		17586		17586		18062		18062		35648	
AM Peak	-	06:45	-	-	-	07:15	-	-	-	-	-
Vol.	-	1401	-	-	-	1347	-	-	-	-	-
P.H.F.		0.949				0.920					
PM Peak	-	-	04:30	-	-	-	05:30	-	-	-	-
Vol.	-	-	1468	-	-	-	1642	-	-	-	-
P.H.F.			0.934				0.966				
Percentage		40.4%	59.6%			36.3%	63.7%				
ADT/AADT		ADT 35,648		AADT 35,648							

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Seal Beach
Pacific Coast Highway
B/ Main Street - 12th Street
24 Hour Directional Volume Count

SBH002
Site Code: 075-16662

Start Time	12/14/2016 Wed	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		29	189			31	242				
12:15		34	186			24	250				
12:30		25	203			31	205				
12:45		26	248	114	826	21	210	107	907	221	1733
01:00		25	245			9	197				
01:15		15	267			14	202				
01:30		17	265			15	200				
01:45		7	275	64	1052	10	202	48	801	112	1853
02:00		7	212			16	236				
02:15		10	236			9	223				
02:30		9	213			8	248				
02:45		14	264	40	925	12	260	45	967	85	1892
03:00		21	280			4	282				
03:15		8	270			11	310				
03:30		3	276			7	287				
03:45		10	326	42	1152	15	359	37	1238	79	2390
04:00		18	312			22	367				
04:15		20	342			31	338				
04:30		26	341			42	364				
04:45		32	313	96	1308	61	391	156	1460	252	2768
05:00		50	**358**			67	**389**				
05:15		61	**343**			84	**379**				
05:30		76	**321**			120	**376**				
05:45		113	**336**	300	1358	137	**408**	408	1552	708	2910
06:00		190	274			200	382				
06:15		297	298			253	375				
06:30		**389**	209			290	345				
06:45		**381**	180	1257	961	254	271	997	1373	2254	2334
07:00		**415**	161			**382**	266				
07:15		**341**	140			**336**	213				
07:30		292	142			**356**	162				
07:45		339	162	1387	605	**322**	145	1396	786	2783	1391
08:00		319	149			303	140				
08:15		266	136			315	151				
08:30		280	118			289	110				
08:45		203	111	1068	514	224	113	1131	514	2199	1028
09:00		197	109			215	92				
09:15		210	87			235	105				
09:30		186	100			246	102				
09:45		198	90	791	386	200	130	896	429	1687	815
10:00		219	71			181	119				
10:15		193	76			211	95				
10:30		179	65			216	93				
10:45		202	48	793	260	202	62	810	369	1603	629
11:00		190	48			242	51				
11:15		188	38			241	30				
11:30		171	34			287	56				
11:45		197	26	746	146	231	40	1001	177	1747	323
Total		6698	9493	6698	9493	7032	10573	7032	10573	13730	20066
Combined Total		16191		16191		17605		17605		33796	
AM Peak	-	06:30	-	-	-	07:00	-	-	-	-	-
Vol.	-	1526	-	-	-	1396	-	-	-	-	-
P.H.F.		0.919				0.914					
PM Peak	-	-	05:00	-	-	-	05:00	-	-	-	-
Vol.	-	-	1358	-	-	-	1552	-	-	-	-
P.H.F.			0.948				0.951				
Percentage		41.4%	58.6%			39.9%	60.1%				
ADT/AADT		ADT 33,796		AADT 33,796							

APPENDIX C

Explanation and Calculation of Intersection Capacity Utilization/Delay

EXPLANATION AND CALCULATION OF INTERSECTION CAPACITY UTILIZATION

Overview

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually greater between intersections and less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. If capacity is 1,600 vehicles per lane per hour of green, and if the green phase is 50 percent of the cycle and there are three lanes, then the capacity is 1,600 times 50 percent times 3 lanes, or 2,400 vehicles per hour for that approach.

The technique used to compare the volume and capacity at a signalized intersection is known as Intersection Capacity Utilization. Intersection Capacity Utilization, usually expressed as a percent, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity (i.e., an Intersection Capacity Utilization of 80 percent), then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

Intersection Capacity Utilization analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement of traffic, (b) summing the times for the movements, and (c) comparing the total time required to the total time available. For example, if for north-south traffic the northbound traffic is 1,600 vehicles per hour, the southbound traffic is 1,200 vehicles per hour, and the capacity of either direction is 3,200 vehicles per hour, then the northbound traffic is critical and requires 1,600/3,200 or 50 percent of the signal time. If for east-west traffic, 30 percent of the signal time is required, then it can be seen that the Intersection Capacity Utilization is 50 plus 30, or 80 percent. When left turn arrows (left turn phasing) exist, they are incorporated into the analysis. The critical movements are usually the heavy left turn movements and the opposing through movements.

The Intersection Capacity Utilization technique is an ideal tool to quantify existing as well as future intersection operation. The impact of adding a lane can be quickly determined by examining the effect the lane has on the Intersection Capacity Utilization.

Intersection Capacity Utilization Worksheets That Follow This Discussion

The Intersection Capacity Utilization worksheet table contains the following information:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. For right turn lanes, whether the lane is a free right turn lane, whether it has a right turn arrow, and the percent of right turns on red that are assumed.

4. Capacity assumed per lane.

5. Capacity available to serve each movement (number of lanes times capacity per lane).

6. Volume to capacity ratio for each movement.

7. Whether the movement's volume to capacity ratio is critical and adds to the Intersection Capacity Utilization value.

8. The yellow time or clearance interval assumed.

9. Adjustments for right turn movements.

10. The Intersection Capacity Utilization and Level of Service.

The Intersection Capacity Utilization Worksheet also has two graphics on the same page. These two graphics show the following:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. The approach and exit leg volumes.

4. The two-way leg volumes.

5. An estimate of daily traffic volumes that is fairly close to actual counts and is based strictly on the peak hour leg volumes multiplied by a factor.

6. Percent of daily traffic in peak hours.

7. Percent of peak hour leg volume that is inbound versus outbound.

A more detailed discussion of Intersection Capacity Utilization and Level of Service follows.

Level of Service

Level of Service is used to describe the quality of traffic flow. Levels of Service A to C operate quite well. Level of Service C is typically the standard to which rural roadways are designed.

Level of Service D is characterized by fairly restricted traffic flow. Level of Service D is the standard to which urban roadways are typically designed. Level of Service E is the maximum volume a facility can accommodate and will result in possible stoppages of momentary duration. Level of Service F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

A description of the various Levels of Service appears at the end of the Intersection Capacity Utilization description, along with the relationship between Intersection Capacity Utilization and Level of Service.

Signalized Intersections

Although calculating an Intersection Capacity Utilization value for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volumes with a signal. A traffic signal becomes warranted before Level of Service D is reached for a signalized intersection.

Signal Timing

The Intersection Capacity Utilization calculation assumes that a signal is properly timed. It is possible to have an Intersection Capacity Utilization well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient green time to satisfy its demand, and excess green time exists on other movements. This is an operational problem that should be remedied.

Lane Capacity

Capacity is often defined in terms of roadway width; however, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Our data indicates a typical lane, whether a through lane or a left turn lane, has a capacity of approximately 1,750 vehicles per hour of green time, with nearly all locations showing

a capacity greater than 1,600 vehicles per hour of green per lane. Right turn lanes have a slightly lower capacity; however 1,600 vehicles per hour is a valid capacity assumption for right turn lanes.

This finding is published in the August 1978 issue of Institute of Transportation Engineers Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. A capacity of 1,600 vehicles per hour per lane with no yellow time penalty, or 1,700 vehicles per hour with a 3 or 5 percent yellow time penalty is reasonable.

Yellow Time

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for approximately 10 percent of a signal cycle, and a penalty of 3 to 5 percent is reasonable.

During peak hour traffic operation the yellow times are nearly completely used. If there is no left turn phasing, the left turn vehicles completely use the yellow time. Even if there is left turn phasing, the through traffic continues to enter the intersection on the yellow until just a split second before the red.

Shared Lanes

Shared lanes occur in many locations. A shared lane is often found at the end of an off ramp where the ramp forms an intersection with the cross street. Often at a diamond interchange off ramp, there are three lanes. In the case of a diamond interchange, the middle lane is sometimes shared, and the driver can turn left, go through, or turn right from that lane.

If one assumes a three lane off ramp as described above, and if one assumes that each lane has 1,600 capacity, and if one assumes that there are 1,000 left turns per hour, 500 right turns per hour, and 100 through vehicles per hour, then how should one assume that the three lanes operate. There are three ways that it is done.

One way is to just assume that all 1,600 vehicles (1,000 plus 500 plus 100) are served simultaneously by three lanes. When this is done, the capacity is 3 times 1,600 or 4,800, and the amount of green time needed to serve the ramp is 1,600 vehicles divided by 4,800 capacity or 33.3 percent. This assumption effectively assumes perfect lane distribution between the three lanes that is not realistic. It also means a left turn can be made from the right lane.

Another way is to equally split the capacity of a shared lane and in this case to assume there are 1.33 left turn lanes, 1.33 right turn lanes, and 0.33 through lanes. With this

assumption, the critical movement is the left turns and the 1,000 left turns are served by a capacity of 1.33 times 1,600, or 2,133. The volume to capacity ratio of the critical move is 1,000 divided by 2,133 or 46.9 percent.

The first method results in a critical move of 33.3 percent and the second method results in a critical move of 46.9 percent. Neither is very accurate, and the difference in the calculated Level of Service will be approximately 1.5 Levels of Service (one Level of Service is 10 percent).

The way Kunzman Associates does it is to assign fractional lanes in a reasonable way. In this example, it would be assumed that there is 1.1 right turn lanes, 0.2 through lanes, and 1.7 left turn lanes. The volume to capacity ratios for each movement would be 31.3 percent for the through traffic, 28.4 percent for the right turn movement, and 36.8 percent for the left turn movement. The critical movement would be the 36.8 percent for the left turns.

Right Turn on Red

Kunzman Associates' software treats right turn lanes in one of five different ways. Each right turn lane is classified into one of five cases. The five cases are (1) free right turn lane, (2) right turn lane with separate right turn arrow, (3) standard right turn lane with no right turns on red allowed, (4) standard right turn lane with a certain percentage of right turns on red allowed, and (5) separate right turn arrow and a certain percentage of right turns on red allowed.

Free Right Turn Lane

If it is a free right turn lane, then it is given a capacity of one full lane with continuous or 100 percent green time. A Free right turn lane occurs when there is a separate approach lane for right turning vehicles, there is a separate departure lane for the right turning vehicles after they turn and are exiting the intersection, and the through cross street traffic does not interfere with the vehicles after they turn right.

Separate Right Turn Arrow

If there is a separate right turn arrow, then it is assumed that vehicles are given a green indication and can proceed on what is known as the left turn overlap.

The left turn overlap for a northbound right turn is the westbound left turn. When the left turn overlap has a green indication, the right turn lane is also given a green arrow indication. Thus, if there is a northbound right turn arrow, then it can be turned green for the period of time that the westbound left turns are proceeding.

If there are more right turns than can be accommodated during the northbound through green and the time that the northbound right turn arrow is on, then an adjustment is made to the Intersection Capacity Utilization to account for the green time that needs to be added to the northbound through green to accommodate the northbound right turns.

Standard Right Turn Lane, No Right Turns on Red

A standard right turn lane, with no right turn on red assumed, proceeds only when there is a green indication displayed for the adjacent through movement. If additional green time is needed above that amount of time, then in the Intersection Capacity Utilization calculation a right turn adjustment green time is added above the green time that is needed to serve the adjacent through movement.

Standard Right Turn Lane, With Right Turns on Red

A standard right turn lane with say 20 percent of the right turns allowed to turn right on a red indication is calculated the same as the standard right turn case where there is no right turn on red allowed, except that the right turn adjustment is reduced to account for the 20 percent of the right turning vehicles that can logically turn right on a red light. The right turns on red are never allowed to exceed the time the overlap left turns take plus the unused part of the green cycle that the cross street traffic moving from left to right has.

As an example of how 20 percent of the cars are allowed to turn right on a red indication, assume that the northbound right turn volume needs 40 percent of the signal cycle to be satisfied. To allow 20 percent of the northbound right turns to turn right on red, then during 8 percent of the signal cycle (40 percent of signal cycle times 20 percent that can turn right on red) right turns on red will be allowed if it is feasible.

For this example, assume that 15 percent of the signal cycle is green for the northbound through traffic, and that means that 15 percent of the signal cycle is available to satisfy northbound right turns. After the northbound through traffic has received its green, 25 percent of the signal cycle is still needed to satisfy the northbound right turns (40 percent of the signal cycle minus the 15 percent of the signal cycle that the northbound through used).

Assume that the westbound left turns require a green time of 6 percent of the signal cycle. This 6 percent of the signal cycle is used by northbound right turns on red. After accounting for the northbound right turns that occur on the westbound overlap left turn, 19 percent of the signal cycle is still needed for the northbound right turns (25 percent of the cycle was needed after the northbound through green time was accounted for [see above paragraph], and 6 percent was served during the westbound

left turn overlap). Also, at this point 6 percent of the signal cycle has been used for northbound right turns on red, and still 2 percent more of the right turns will be allowed to occur on the red if there is unused eastbound through green time.

For purpose of this example, assume that the westbound through green is critical, and that 15 percent of the signal cycle is unused by eastbound through traffic. Thus, 2 percent more of the signal cycle can be used by the northbound right turns on red since there is 15 seconds of unused green time being given to the eastbound through traffic.

At this point, 8 percent of the signal cycle was available to serve northbound right turning vehicles on red, and 15 percent of the signal cycle was available to serve right turning vehicles on the northbound through green. So 23 percent of the signal cycle has been available for northbound right turns.

Because 40 percent of the signal cycle is needed to serve northbound right turns, there is still a need for 17 percent more of the signal cycle to be available for northbound right turns. What this means is the northbound through traffic green time is increased by 17 percent of the cycle length to serve the unserved right turn volume, and a 17 percent adjustment is added to the Intersection Capacity Utilization to account for the northbound right turns that were not served on the northbound through green time or when right turns on red were assumed.

Separate Right Turn Arrow, With Right Turns on Red

A right turn lane with a separate right turn arrow, plus a certain percentage of right turns allowed on red is calculated the same way as a standard right turn lane with a certain percentage of right turns allowed on red, except the turns which occur on the right turn arrow are not counted as part of the percentage of right turns that occur on red.

Critical Lane Method

Intersection Capacity Utilization parallels another calculation procedure known as the Critical Lane Method with one exception. Critical Lane Method dimensions capacity in terms of standardized vehicles per hour per lane. A Critical Lane Method result of 800 vehicles per hour means that the intersection operates as though 800 vehicles were using a single lane continuously. If one assumes a lane capacity of 1,600 vehicles per hour, then a Critical Lane Method calculation resulting in 800 vehicles per hour is the same as an Intersection Capacity Utilization calculation of 50 percent since 800/1,600 is 50 percent. It is our opinion that the Critical Lane Method is inferior to the Intersection Capacity Utilization method simply because a statement such as "The Critical Lane Method value is 800 vehicles per hour" means little to most persons, whereas a statement such as "The Intersection Capacity Utilization is 50 percent" communicates

clearly. Critical Lane Method results directly correspond to Intersection Capacity Utilization results. The correspondence is as follows, assuming a lane capacity of 1,600 vehicles per hour and no clearance interval.

Critical Lane Method Method Result	**Intersection Capacity Utilization Result**
800 vehicles per hour	50 percent
960 vehicles per hour	60 percent
1,120 vehicles per hour	70 percent
1,280 vehicles per hour	80 percent
1,440 vehicles per hour	90 percent
1,600 vehicles per hour	100 percent
1,760 vehicles per hour	110 percent

INTERSECTION CAPACITY UTILIZATION
LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Volume to Capacity Ratio
A	Level of Service A occurs when progression is extremely favorable and vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0.600 and below
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.	0.601 to 0.700
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	0.701 to 0.800
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	0.801 to 0.900
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent.	0.901 to 1.000
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs when oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	1.001 and up

[1]Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council, Washington D.C., 2010.

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE USING DELAY METHODOLOGY

The levels of service at the unsignalized and signalized intersections are calculated using the delay methodology in the Highway Capacity Manual. This methodology views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane time's 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking
7. Bus stops at intersections
8. Area type (CBD or other)
9. Right turns

10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length

2. Amount of red time faced by a lane group

3. Amount of yellow time for that lane group

4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1,900 vehicles per hour is used (as recommended in the Highway Capacity Manual), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The

delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay methodology is that it is possible to add traffic to an intersection and reduce the average total delay per vehicle. If the average total delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is added to a movement that has an average total delay of 15 seconds per vehicle, then the overall average total delay is reduced.

The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at Level of Service C and has an average total delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before Level of Service E is reached.

LEVEL OF SERVICE DESCRIPTION[1]

Level Of Service	Description	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Level of Service A 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.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

[1] Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 2010.

Existing

The Bay Theater

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Report File: J:\...\Existing.pdf

Scenario 1: Existing - PM Peak Hour
12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.023	11.4	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	NWB Left	0.666	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	3	3	37	3	4	9	7	29
Total Analysis Volume [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	11.21	10.76	9.31	10.78	11.43	9.21	0.00	0.00	0.00	7.64	7.68	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.11	0.11	0.11	0.00	0.00	0.00	0.14	0.14	0.00
95th-Percentile Queue Length [ft]	3.88	3.88	3.88	2.79	2.79	2.79	0.00	0.00	0.00	3.38	3.38	0.00
d_A, Approach Delay [s/veh]	10.83			10.37			0.00			2.67		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.65											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	18	5	11	40	18	335	3	29	354	27
Total Analysis Volume [veh/h]	70	43	73	19	43	161	73	1339	11	116	1418	108
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.666

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	27	2	5	32	10	7	13	7	12	14	5
Total Analysis Volume [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.66	0.83	0.17	0.42	0.12	0.68
95th-Percentile Queue Length [ft]	16.60	20.64	4.14	10.46	3.01	17.12
Approach Delay [s/veh]	9.59	9.12		8.77		9.75
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.30					
Intersection LOS	A					

Existing Plus Project

The Bay Theater

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Scenario 2: Existing Plus Project - PM Peak Hour
12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.027	11.7	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	SEB Left	0.673	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	15	28	146	11	17	46	27	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	4	7	37	3	4	12	7	29
Total Analysis Volume [veh/h]	18	10	4	0	15	28	146	11	17	46	27	114
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.03	0.02	0.00
d_M, Delay for Movement [s/veh]	11.43	11.04	9.44	11.05	11.70	9.32	0.00	0.00	0.00	7.67	7.70	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.18	0.18	0.18	0.00	0.00	0.00	0.16	0.16	0.00
95th-Percentile Queue Length [ft]	4.03	4.03	4.03	4.60	4.60	4.60	0.00	0.00	0.00	4.07	4.07	0.00
d_A, Approach Delay [s/veh]	11.06			10.15			0.00			3.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.10											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	44	73	25	44	166	72	1315	15	120	1393	106
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	19	6	11	42	18	335	4	31	355	27
Total Analysis Volume [veh/h]	71	45	74	25	45	169	73	1339	15	122	1419	108
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.673

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	107	8	21	127	41	28	50	32	47	57	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	27	2	5	32	10	7	13	8	12	14	5
Total Analysis Volume [veh/h]	8	107	8	21	127	41	28	50	32	47	57	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.67	0.84	0.17	0.42	0.13	0.69
95th-Percentile Queue Length [ft]	16.81	21.06	4.15	10.48	3.34	17.17
Approach Delay [s/veh]	9.62	9.17		8.76		9.77
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.32					
Intersection LOS	A					

Existing Plus Project Plus Cumulative

The Bay Theater

Vistro File: J:\...\AM.vistro

Scenario 3: Existing Plus Project Plus Cumulative - PM Peak Hour

Report File: J:\...\EPC.pdf

12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.027	11.7	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	NWB Left	0.677	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	3	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	15	28	149	11	17	46	27	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	4	7	37	3	4	12	7	29
Total Analysis Volume [veh/h]	18	10	4	0	15	28	149	11	17	46	27	114
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.03	0.02	0.00
d_M, Delay for Movement [s/veh]	11.46	11.07	9.45	11.08	11.73	9.34	0.00	0.00	0.00	7.68	7.71	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.18	0.18	0.18	0.00	0.00	0.00	0.16	0.16	0.00
95th-Percentile Queue Length [ft]	4.05	4.05	4.05	4.62	4.62	4.62	0.00	0.00	0.00	4.09	4.09	0.00
d_A, Approach Delay [s/veh]	11.08			10.17			0.00			3.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.08											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	3	0	0	10	11	0	0	8	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	44	73	28	44	166	82	1326	15	120	1401	106
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	19	7	11	42	21	338	4	31	357	27
Total Analysis Volume [veh/h]	71	45	74	29	45	169	84	1350	15	122	1427	108
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.677

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	2	0	0	0	0	1	1	1	1	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	109	8	21	127	41	29	51	33	48	57	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	27	2	5	32	10	7	13	8	12	14	5
Total Analysis Volume [veh/h]	8	109	8	21	127	41	29	51	33	48	57	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.69	0.85	0.17	0.43	0.14	0.70
95th-Percentile Queue Length [ft]	17.19	21.13	4.16	10.81	3.46	17.39
Approach Delay [s/veh]	9.67	9.19		8.79		9.80
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.35					
Intersection LOS	A					

Opening Year (2017) Without Project

The Bay Theater

Vistro File: J:\...\AM.vistro

Scenario 4: Opening Year (2017) Without Project - PM Peak Hour

Report File: J:\...\OY.pdf

12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.023	11.5	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	NWB Left	0.672	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	13	12	147	10	17	34	27	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	3	3	37	3	4	9	7	29
Total Analysis Volume [veh/h]	18	10	4	0	13	12	147	10	17	34	27	115
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	11.23	10.77	9.31	10.80	11.45	9.22	0.00	0.00	0.00	7.65	7.68	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.11	0.11	0.11	0.00	0.00	0.00	0.14	0.14	0.00
95th-Percentile Queue Length [ft]	3.89	3.89	3.89	2.80	2.80	2.80	0.00	0.00	0.00	3.38	3.38	0.00
d_A, Approach Delay [s/veh]	10.84			10.38			0.00			2.66		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.64											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	42	73	19	42	160	73	1328	11	115	1406	107
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	19	5	11	41	19	338	3	29	358	27
Total Analysis Volume [veh/h]	71	43	74	19	43	163	74	1352	11	117	1432	109
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.672

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	107	8	20	127	41	28	51	29	47	58	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	27	2	5	32	10	7	13	7	12	15	5
Total Analysis Volume [veh/h]	8	107	8	20	127	41	28	51	29	47	58	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.67	0.83	0.17	0.43	0.12	0.69
95th-Percentile Queue Length [ft]	16.80	20.86	4.15	10.63	3.01	17.32
Approach Delay [s/veh]	9.62	9.15		8.79		9.77
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.33					
Intersection LOS	A					

Opening Year (2017) With Project

The Bay Theater

Vistro File: J:\...\AM.vistro

Scenario 5: Opening Year (2017) With Project - PM Peak Hour

Report File: J:\...\OYP.pdf

12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.027	11.7	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	SEB Left	0.679	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	15	28	147	11	17	46	27	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	4	7	37	3	4	12	7	29
Total Analysis Volume [veh/h]	18	10	4	0	15	28	147	11	17	46	27	115
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.03	0.02	0.00
d_M, Delay for Movement [s/veh]	11.45	11.05	9.44	11.07	11.72	9.33	0.00	0.00	0.00	7.67	7.71	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.18	0.18	0.18	0.00	0.00	0.00	0.16	0.16	0.00
95th-Percentile Queue Length [ft]	4.04	4.04	4.04	4.61	4.61	4.61	0.00	0.00	0.00	4.08	4.08	0.00
d_A, Approach Delay [s/veh]	11.07			10.16			0.00			2.98		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.09											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	44	74	25	44	168	73	1328	15	121	1407	107
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	19	6	11	43	19	338	4	31	358	27
Total Analysis Volume [veh/h]	72	45	75	25	45	171	74	1352	15	123	1433	109
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.679

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	108	8	21	128	41	28	51	32	47	58	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	27	2	5	32	10	7	13	8	12	15	5
Total Analysis Volume [veh/h]	8	108	8	21	128	41	28	51	32	47	58	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.68	0.85	0.17	0.43	0.13	0.69
95th-Percentile Queue Length [ft]	17.01	21.28	4.16	10.65	3.35	17.37
Approach Delay [s/veh]	9.65	9.19		8.78		9.79
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.35					
Intersection LOS	A					

Opening Year (2017) With Project Plus Cumulaitve

The Bay Theater

Vistro File: J:\...\AM.vistro

Scenario 6: Opening Year (2017) With Project Plus Cumulative - PM Peak Hour

Report File: J:\...\OYPC.pdf

12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.027	11.7	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	NWB Left	0.683	-	B
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	3	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	10	4	0	15	28	150	11	17	46	27	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	0	4	7	38	3	4	12	7	29
Total Analysis Volume [veh/h]	18	10	4	0	15	28	150	11	17	46	27	115
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.03	0.02	0.00
d_M, Delay for Movement [s/veh]	11.48	11.08	9.45	11.09	11.74	9.35	0.00	0.00	0.00	7.68	7.71	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.16	0.19	0.19	0.19	0.00	0.00	0.00	0.16	0.16	0.00
95th-Percentile Queue Length [ft]	4.06	4.06	4.06	4.63	4.63	4.63	0.00	0.00	0.00	4.09	4.09	0.00
d_A, Approach Delay [s/veh]	11.10			10.18			0.00			2.99		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.07											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.683

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	3	0	0	10	11	0	0	8	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	44	74	28	44	168	83	1339	15	121	1415	107
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	11	19	7	11	43	21	341	4	31	360	27
Total Analysis Volume [veh/h]	72	45	75	29	45	171	85	1364	15	123	1441	109
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	B
Intersection V/C	0.683

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	2	0	0	0	0	1	1	1	1	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	110	8	21	128	41	29	52	33	48	58	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	28	2	5	32	10	7	13	8	12	15	5
Total Analysis Volume [veh/h]	8	110	8	21	128	41	29	52	33	48	58	19
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.70	0.85	0.17	0.44	0.14	0.70
95th-Percentile Queue Length [ft]	17.39	21.35	4.17	10.98	3.46	17.60
Approach Delay [s/veh]	9.69	9.22		8.81		9.82
Approach LOS	A	A		A		A
Intersection Delay [s/veh]	9.38					
Intersection LOS	A					

Buildout Without Project

The Bay Theater

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Scenario 7: Buildout Without Project - PM Peak Hour
12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.031	12.2	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	SEB Left	0.797	-	C
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		10.0	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.031

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	12	5	0	16	15	180	12	21	42	33	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	3	1	0	4	4	45	3	5	11	8	35
Total Analysis Volume [veh/h]	22	12	5	0	16	15	180	12	21	42	33	140
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.01	0.00	0.03	0.02	0.00	0.00	0.00	0.03	0.02	0.00
d_M, Delay for Movement [s/veh]	12.12	11.33	9.65	11.52	12.21	9.49	0.00	0.00	0.00	7.76	7.80	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.21	0.15	0.15	0.15	0.00	0.00	0.00	0.17	0.17	0.00
95th-Percentile Queue Length [ft]	5.31	5.31	5.31	3.80	3.80	3.80	0.00	0.00	0.00	4.34	4.34	0.00
d_A, Approach Delay [s/veh]	11.56			10.89			0.00			2.71		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.75											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.797

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	52	89	23	52	194	89	1617	14	140	1712	130
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	13	23	6	13	49	23	412	4	36	436	33
Total Analysis Volume [veh/h]	87	53	91	23	53	198	91	1647	14	143	1743	132
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	C
Intersection V/C	0.797

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	130	10	25	155	50	34	62	36	58	70	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	33	3	6	39	13	9	16	9	15	18	6
Total Analysis Volume [veh/h]	10	130	10	25	155	50	34	62	36	58	70	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.91	1.14	0.22	0.56	0.16	0.94
95th-Percentile Queue Length [ft]	22.72	28.62	5.38	14.03	4.00	23.48
Approach Delay [s/veh]	10.37	9.91		9.30		10.57
Approach LOS	B	A		A		B
Intersection Delay [s/veh]	10.04					
Intersection LOS	B					

Buildout With Project

The Bay Theater

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Scenario 8: Buildout With Project - PM Peak Hour
12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.036	12.5	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	SEB Left	0.804	-	D
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		10.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	12	5	0	18	31	180	13	21	54	33	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	3	1	0	5	8	45	3	5	14	8	35
Total Analysis Volume [veh/h]	22	12	5	0	18	31	180	13	21	54	33	140
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.01	0.00	0.04	0.04	0.00	0.00	0.00	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	12.38	11.64	9.79	11.83	12.51	9.61	0.00	0.00	0.00	7.79	7.83	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.22	0.23	0.23	0.23	0.00	0.00	0.00	0.20	0.20	0.00
95th-Percentile Queue Length [ft]	5.52	5.52	5.52	5.78	5.78	5.78	0.00	0.00	0.00	5.08	5.08	0.00
d_A, Approach Delay [s/veh]	11.82			10.68			0.00			2.99		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.14											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.804

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	54	90	29	54	202	89	1617	18	146	1713	130
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	14	23	7	14	51	23	412	5	37	436	33
Total Analysis Volume [veh/h]	88	55	92	30	55	206	91	1647	18	149	1744	132
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	D
Intersection V/C	0.804

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	131	10	26	156	50	34	62	39	58	70	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	33	3	7	39	13	9	16	10	15	18	6
Total Analysis Volume [veh/h]	10	131	10	26	156	50	34	62	39	58	70	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.92	1.17	0.22	0.56	0.17	0.94
95th-Percentile Queue Length [ft]	22.98	29.14	5.39	14.06	4.36	23.55
Approach Delay [s/veh]	10.41	9.96		9.30		10.60
Approach LOS	B	A		A		B
Intersection Delay [s/veh]	10.07					
Intersection LOS	B					

Buildout With Project Plus Cumulative

The Bay Theater

Vistro File: J:\...\AM.vistro

Scenario 9: Buildout With Project Plus Cumulative - PM Peak Hour

Report File: J:\...\BPC.pdf

12/22/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)	Two-way stop	HCM 2010	EB Thru	0.036	12.5	B
2	Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)	Signalized	ICU 1	NWB Left	0.808	-	D
3	Main St (NS) at Electric Ave (EW)	All-way stop	HCM 2010	SEB Thru		10.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Bolsa Ave/Silver Shoals Ave (NS) at Driveway/Bolsa Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name												
Approach	Southbound			Eastbound			Westbound			Northeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	55.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

volumes

Name												
Base Volume Input [veh/h]	18	10	4	0	13	12	146	10	17	34	27	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	0	0	0	3	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	2	16	0	1	0	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	12	5	0	18	31	183	13	21	54	33	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	3	1	0	5	8	46	3	5	14	8	35
Total Analysis Volume [veh/h]	22	12	5	0	18	31	183	13	21	54	33	140
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.01	0.00	0.04	0.04	0.00	0.00	0.00	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	12.42	11.67	9.80	11.86	12.55	9.63	0.00	0.00	0.00	7.79	7.84	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.22	0.23	0.23	0.23	0.00	0.00	0.00	0.20	0.20	0.00
95th-Percentile Queue Length [ft]	5.55	5.55	5.55	5.81	5.81	5.81	0.00	0.00	0.00	5.09	5.09	0.00
d_A, Approach Delay [s/veh]	11.85			10.70			0.00			2.99		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.13											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Main St/Bolsa Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.808

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	105.00	100.00	105.00	75.00	100.00	85.00	115.00	100.00	100.00	155.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	69	42	72	19	42	158	72	1315	11	114	1392	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	0	0	3	0	0	10	11	0	0	8	0
Site-Generated Trips [veh/h]	1	2	1	6	2	8	0	0	4	6	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	54	90	32	54	202	99	1628	18	146	1721	130
Peak Hour Factor	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820	0.9820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	14	23	8	14	51	25	414	5	37	438	33
Total Analysis Volume [veh/h]	88	55	92	33	55	206	101	1658	18	149	1753	132
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						1,4						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

Intersection LOS	D
Intersection V/C	0.808

Intersection Level Of Service Report
Intersection 3: Main St (NS) at Electric Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name												
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	145.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name												
Base Volume Input [veh/h]	8	106	8	20	126	41	28	50	29	47	57	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
In-Process Volume [veh/h]	0	2	0	0	0	0	1	1	1	1	0	0
Site-Generated Trips [veh/h]	0	1	0	1	1	0	0	0	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	133	10	26	156	50	35	63	40	59	70	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	33	3	7	39	13	9	16	10	15	18	6
Total Analysis Volume [veh/h]	10	133	10	26	156	50	35	63	40	59	70	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

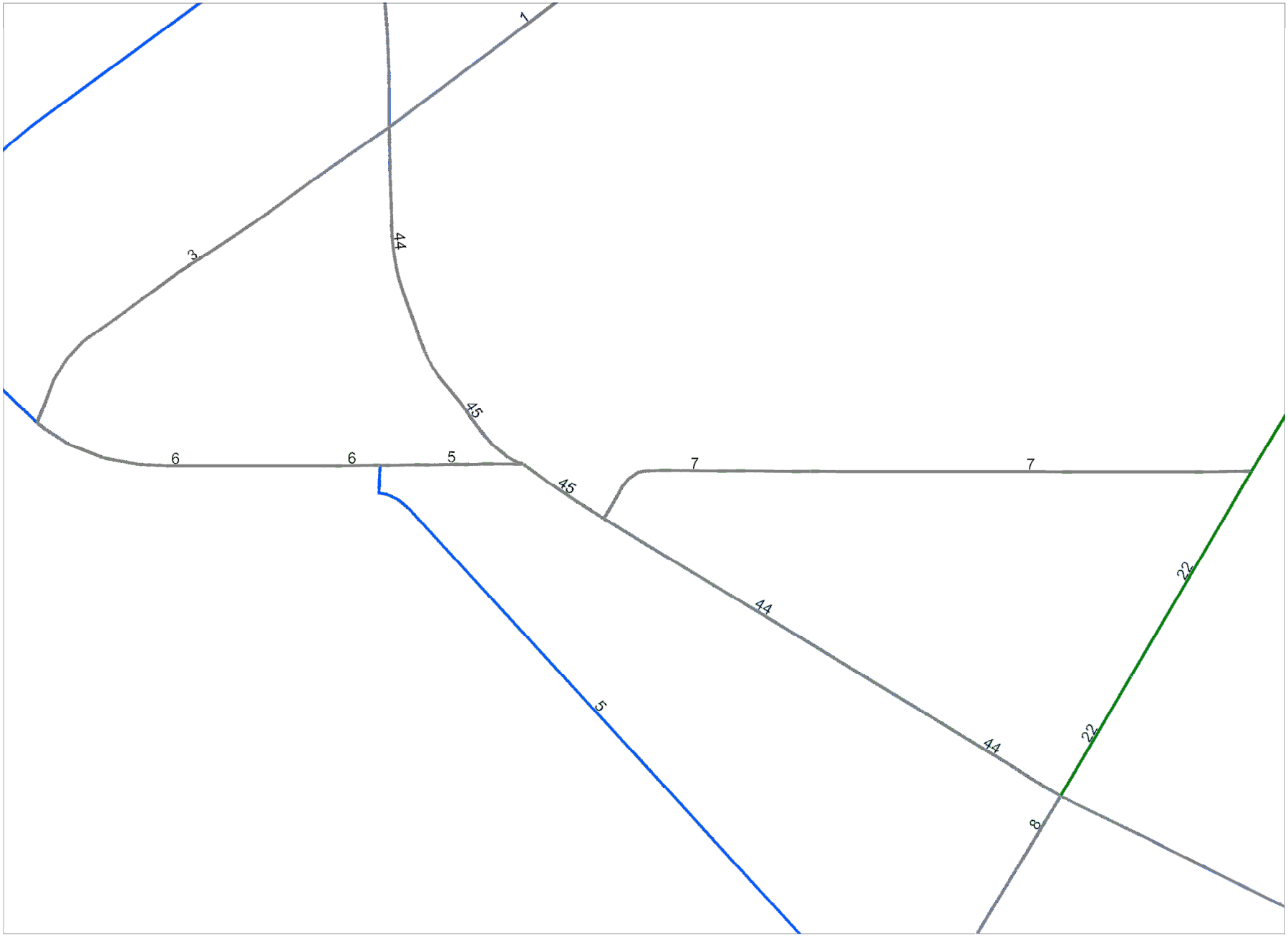
Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.94	1.17	0.22	0.58	0.18	0.95
95th-Percentile Queue Length [ft]	23.45	29.26	5.41	14.44	4.49	23.83
Approach Delay [s/veh]	10.46	9.99		9.33		10.64
Approach LOS	B	A		A		B
Intersection Delay [s/veh]	10.11					
Intersection LOS	B					

APPENDIX D

Orange County Transportation Analysis Model Plots

OCTAM 3.4.2 - Year 2035 Build-Out/MPAH Daily Forecasts
Volumes in Thousands

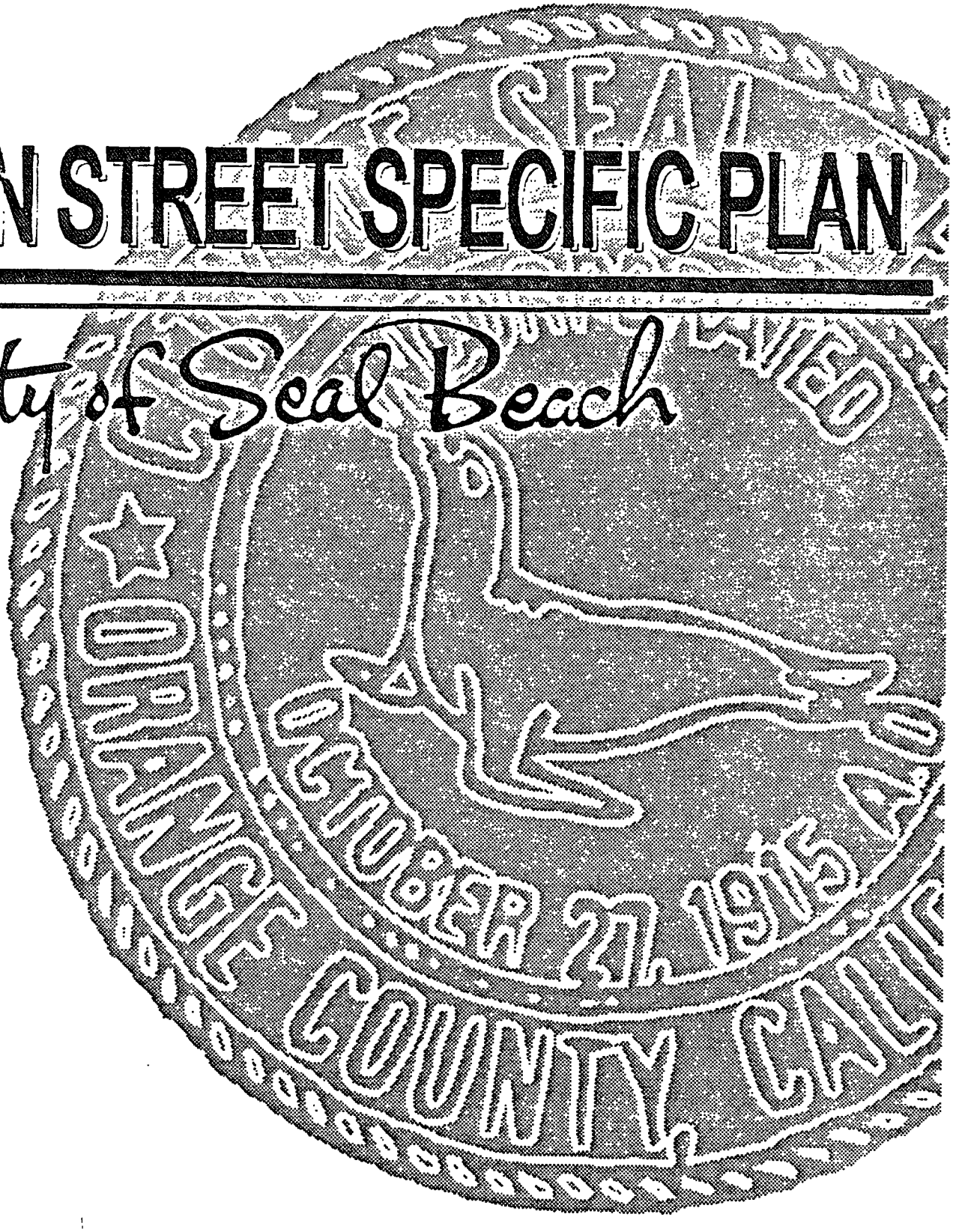


APPENDIX E

City of Seal Beach Main Street Specific Plan

MAIN STREET SPECIFIC PLAN

City of Seal Beach



MAIN STREET SPECIFIC PLAN

CITY OF SEAL BEACH

July 8, 1996

ACKNOWLEDGEMENTS

City Council

Mayor Gwen Forsythe
Mayor Pro Tem Marilyn Hastings
Councilman George E. Brown
Councilman Bill Doane
Councilman Frank Laszlo*
Councilwoman Patti Campbell

Planning Commission

Chairperson Patti Campbell
Vice-Chairman Brian Brown
Commissioner Anton Dahlman
Commissioner Mary Law
Commissioner Jim Sharp

City Staff

Joanne Yeo, City Clerk
Jerry Bankston, City Manager**
Keith R. Till, City Manager
Lee Whittenberg, Director of Development Services
Barry Curtis, Assistant Planner Dept. of Development Services
Joan Fillmann, Executive Secretary, Dept. of Development Services

Consultants

Zucker Systems, San Diego
Paul C. Zucker, President
Laurie Price, Planner
Ryan McAweeney, Graphic Designer
Amy Becker, Administrative Assistant

Linscott, Law & Greenspan, Costa Mesa
Jack Greenspan, P.E.
Jay Nelson

* Former Member of City Council
**Formerly with City

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1. INTRODUCTION

A. Vision

The Main Street Specific Plan has been prepared by the City of Seal Beach to provide a long range "vision" and implementing actions for the preservation and enhancement of downtown Seal Beach. The Plan applies to the approximately 21 acres shown on Figure 1. It includes the previous C-1 zoning district surrounding Main Street, the previous C-2 zone at the corner of Main Street and Pacific Coast Highway and related public uses. The regulatory portions of the Specific Plan are implemented through the creation of a new Main Street Specific Plan Zone (C-SP Zone) in the City's Zoning Code.

This Plan revises a Main Street Specific Plan adopted by the City Council in January 1976. It builds on a report prepared by the Downtown Parking and Urban Design Task Force in 1984. The current Plan is the result of studies conducted in 1994 and 1995. The study included numerous interviews, an opinion survey sent to 1,200 residents and businesses with a 50% return, detailed parking counts, an up-to-date land use survey, and various other field studies.

The Plan is based on the following vision:

VISION

The Main Street area is particularly important because it is a cohesive agent for a city that is geographically fragmented. The vision for Main Street is small town America. Important features include a family town with friendly people who care for each other. A pedestrian oriented area where people walk and feel safe on the street at night. An area with both architectural and economic diversity with a mix of offices and businesses. Main Street is surrounded by an area of mixed housing types and institutions, creating a complete small town community. Although it is recognized that the area will have businesses that serve both residents and visitors, the goal is to not have visitor serving uses overwhelm the area at the expense of the small town character. It is also recognized that when the weather and beach conditions are attractive, the demand for parking may exceed the supply.

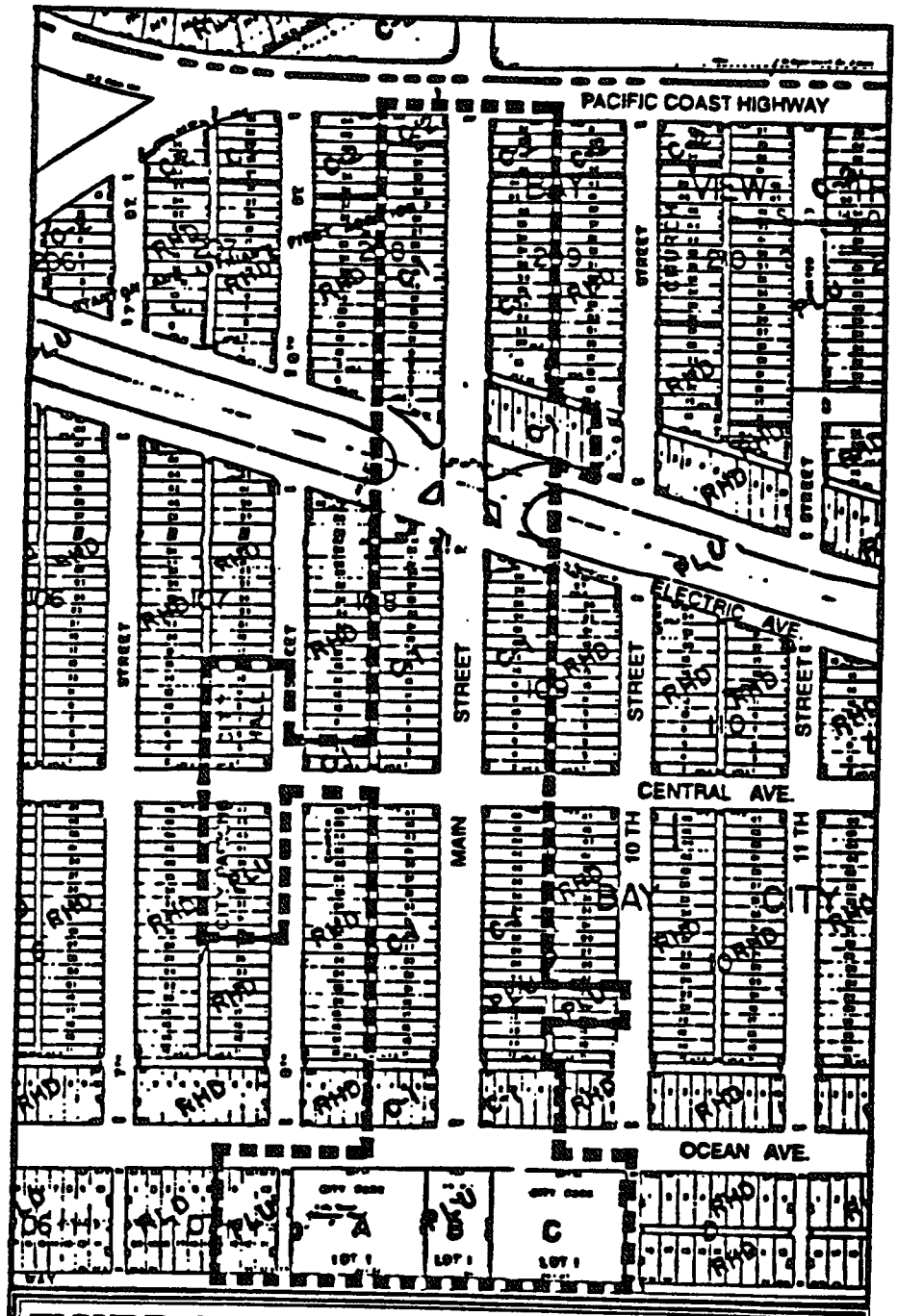


FIGURE: 1 *(C-SP Zone)*
MAIN STREET SPECIFIC PLAN BOUNDRY

ZUCKER SYSTEMS

The differential standards used in the Main Street Specific Plan may seem to some as unfair in relation to the rest of the City. However, the VISION clearly establishes the importance of Main Street and justifies its differential treatment. What would Seal Beach be like without Main Street? The Plan recognizes Main Street as the heart and soul of Seal Beach.

What makes a community special is often the very same factor that causes pressure for change. The more charming a town appears, the greater the demand upon the community from the outside. The need to serve the visitor brings with it new businesses that can change the character of the town. Main streets like Seal Beach's have disappeared all over the country. Typical issues include:

If they become very tourist popular, tourist uses and chain stores out bid local uses, driving up the rents and driving out local uses.

Traditional small one-of-a-kind stores have trouble competing with the big box retailers and chain stores.

The Main Street Specific Plan is designed to address these issues.

B. Statutory Authority

The Specific Plan is authorized by Article 8 of the California Government Code (Section 65450 et. seq.) and this document meets the requirements as specified in Section 65451.

C. Relation to the General Plan

The Specific Plan carries out the objectives of the Seal Beach General Plan. It provides the detailed criteria for development of specific sites and public improvements.

The Specific Plan is relatively high in the land use hierarchy, coming just below the General Plan. Zoning, subdivisions, public works projects and development agreements all must be consistent with the adopted Specific Plan.

The Plan creates a bridge between General Plan policies and individual development proposals.

Specific language relating the Specific Plan to the General Plan is included in Chapter 8.

D. Relation to the Zoning Code and Other City Ordinances

The regulatory portions of the Specific Plan have been incorporated into the City's Zoning Code and are also repeated in this Specific Plan document. Therefore, the City's Zoning Code or other City ordinances, including those ordinances amended or enacted as part of this adoption of this Specific Plan, continue to apply to the Main Street Specific Plan area.

2. LAND USE

The small town village charm of Seal Beach's Main Street area comes from a variety of factors including the eclectic mix of architecture, constrained area (only three blocks long), and relation to the ocean. However, of major importance, if not the single most important element, is the mix of uses in close proximity to one another.

Within the area there are 107 commercial parcels. Along Main Street and immediately adjacent to Ocean, Central and Electric Avenues there are 121 existing businesses located at street level. 38 office suites are situated on the second and third floors above Main Street.

The 1994 land use is shown in a separate Background Studies report.

The commercial uses are the key to the area's special character. The commercial center has been able to retain its small town character due to those businesses that depend on and support the adjoining residential development. These uses are traditionally found in a small town, village center. It is important that they be retained and other similar uses be encouraged to establish on Main Street whenever possible. In Seal Beach these uses include: grocery store, financial institution, hardware store, Post Office, drug store, movie theater, and nursery.

Additional land uses such as bookstores, video rentals, newspaper, cafes, doctor's offices, barber shops etc. are also essential to a small town character. Table 1 summarizes the 1994 land use.

TABLE 1
1994 Street Level Land Use by Type and Number of Businesses Within Specific Plan Boundary

Use Type	Number of Businesses
Food and Beverage	
Food Service w/o Liquor	9
Food Service w/ Liquor	14
Bar	2
Total	25
Retail	
Antiques	5
Books	2
Clothing	17
Flowers	2
Food & Sundries	3
Art Gallery	7
Gas	2
Gift	5
Jewelry	3
Liquor	2
Sporting Equipment 3	
Drug Store	2
Home-Decorating & Improvement	1
Other	1
Total	55
Office	
Financial	2
Law	4
Medical	2
Real Estate	2
Travel	2
Other	6
Total	18
Services	
Beauty Salon	14
Dry Cleaners	2
Printing	2
Other	5
Total	23

Businesses that serve the residential community of Seal Beach also receive a percentage of their business from the visitors to the community, and in some cases without the visitors' business, they might not be able to survive.

Part of Seal Beach's old town charm is the close proximity of its residential development to the commercial establishments. This arrangement is highly desirable.

Frequently, the biggest conflict between a commercial center and an adjoining residential neighborhood is between the residents and the nearby eating and drinking establishments. In the Main Street area of Seal Beach there are 23 restaurants of which 14 serve liquor, see Table 2. Also there are two bars which serve no food and three other businesses licensed to sell liquor for off-premise consumption.

Table 2 also indicates which eating establishments serve alcoholic beverages and their closing hours. A majority of the establishments are licensed to sell only beer and wine, and generally close between ten and eleven o'clock in the evening. The two bars and four restaurants with general liquor licenses (permitted to sell distilled alcohol as well as beer and wine) are allowed to stay open later. All establishments are closed by 2:00 am.

The Main Street business area is located in Census Tract 995.05, which is identified by the State Department of Alcoholic Beverage Control (ABC) as being "overconcentrated". Overconcentration is a guideline utilized by the ABC to determine if additional alcoholic beverage licenses should be issued in that area. Seal Beach requires a "conditional use permit" for any alcoholic beverage type of sale, and the City can consider the potential impact of an "overconcentration" of ABC licenses during the public hearing process. Without a conditional use permit approval from the City, ABC will not issue a new alcoholic beverage sales license within the City. Based on 1990 U.S. Census population information, Census Tract 995.05 would support a total of 13 on- and off-premise licenses, with the tract currently having 33 licensed location, 20 of which are within the Main Street Specific Plan area. Those alcohol serving businesses with the Main Street Specific Plan area are set forth in Table 2, following.

TABLE 2
Establishments Serving Alcohol
By Type of License

Establishment	Beer/ Wine	General	Entertain-ment	Closing Hours Su-Th	F-Sa
Food and Beverage					
Seaside Grill	X			10:00	11:00
Taco Surf	X			10:00	10:00
Pasta Grotto	X			10:00	11:00
Don Juan's Taco	X			9:00	9:00
Hennessey's	X	X		1:30	1:300
Papillon	X	X	X	1:00**	1:00
Walt's Wharf	X	X		11:00	12:00
BJ's Pizzeria	X			10:00	11:00
Main St. Cafe & Grille	X			10:00	10:00
Mandarin Garden	X				
Bayou St. John	X			10:30	10:30
Cafe Lafeyette	X			9:00	10:00
Ruby's	X			10:00	10:00
Kinda Lahina	X	X		11:00	12:00
El Burrito Jr.	X			10:00	12:00
Beverage					
Clancy's	X	X		2:00	2:00
Irisher	X	X		2:00	2:00
Off Site Consumption					
Seal Beach Liquor	X	X		11:00	12:00
Johns Food King	X			10:00	11:00
Nip 'n Stuff	X	X		2:00	2:00

**Sun.–11:00

POLICY 1. Create A New Main Street Specific Plan Zone (Article 12.5, Section 28-1250 and 28-1251, C-SP Zone)

Section 28-1250. Permitted Uses.

A. Permitted Uses
   1) Barbershops and beauty parlors;
   2) Coffee houses, dessert shops and similar establishments provided there is seating for no more than 10 customers and the gross square footage of the establishment does not exceed 1,000 sq. ft;

3) Financial institutions;
4) General retail businesses such as grocery store, furniture store, etc.;
5) Horticultural Nursery;
6) Medical offices and laboratories facing Main Street or Ocean Avenue (2nd floor or above only);
7) Medical offices and laboratories not facing Main Street or Ocean Avenue;
8) Prescription pharmacies;
9) Professional offices facing Main Street or Ocean Avenue (2nd floor and above only);
10) Professional offices not facing Main Street or Ocean Avenue;
11) Service businesses dealing directly with consumers (dressmaker, nail shop, tailor, etc);
12) Accessory buildings and structures; and
13) Other similar uses when determined by the Planning Commission to be consistent with the Main Street Specific Plan and compatible with other permitted uses within the zone.

B. Uses Subject to Issuance of a Conditional Use Permit

1) Automatic ice vending machines;
2) Coffee houses, dessert shops and similar establishments with seating for more than 10 customers and the gross square footage of the establishment exceeds 1,000 sq. ft.;
3) Coin operated amusement machines as a secondary use;
4) Commercial activities operating between the hours of 2:00 a.m. and 6:00 a.m.;
5) Entertainment cafes;
6) Gas Stations located on a major arterial, subject to compliance with the performance and development standards imposed by Section 23-2318;
7) Horticultural Nursery;
8) Liquor establishments, if part of a grocery store, provided that the number of such establishments permitted in the Main Street Specific Plan Zone shall not exceed two (2) at any one time. Permitted operating hours for such establishments shall be 7:00 a.m. to 10:00

p.m., Sunday through Thursday, and 7:00 a.m. to 11:00 p.m., Friday, Saturday, and holidays. Any such establishments which qualify for temporary on-sale or off-sale licenses under the provisions of California Business and Professions Code Sections 24045.1, 24045.2, 24045.3, 24045.4, 24045.6, 24045.7, 24045.8, and 24045.9, as may be amended, shall be exempt from this requirement for a Conditional Use Permit;

9) Medical offices and laboratories facing Main Street or Ocean Avenue (1st floor);
10) Movie Theaters;
11) Parking garage;
12) Pet shop;
13) Private parking lots;
14) Professional offices facing Main Street or Ocean Avenue (1st floor);
15) Recycling facilities as defined in Section 28-2321 and as follows:
    a) Reverse vending machines;
    b) Small collection recycling facilities within a convenience zone; and
    c) Mobile recycling units within a convenience zone;
16) Restaurant, with or without alcohol sales (not including drive-in restaurants). Permitted operating hours of such restaurants shall be 7:00 a.m. to 10:00 p.m., Sunday through Thursday, and 7:00 a.m. to 11:00 p.m., Friday, Saturday, and holidays ;
17) Similar retail or service establishments catering directly to consumers when interpreted by the Planning Commission as meeting the intent of service commercial uses and the General Plan; and
18) Veterinary out-patient clinic.

Section 28-1251. Limitations on Permitted Uses.

Every use permitted shall be subject to the following conditions and limitations:

A. All uses shall be conducted wholly within an enclosed building except such uses as:
    1) Growing stock, only when in connection with horticultural nurseries;
    2) Parking lots;

3) Restaurant, semi-enclosed.

B. Storage shall be limited to accessory storage of commodities sold at retail on the premises.

C. All operations conducted on the premises shall not be objectionable by reason of noise, odor, dust, mud, smoke, steam, vibration or other similar causes.

D. Where any property used for commercial purposes has a common property line with property zoned for residential purposes, no commercial use shall be established thereon unless there is first erected a solid masonry or concrete block wall not less than eight feet in height at such property line, except where a wall of a building is on such property line, no separate block wall need be provided.

E. Findings required for Conditional Use Permits within the Main Street Specific Plan boundaries:

1) Additional Findings Required. In reviewing applications for Conditional Use Permits for the Main Street area, the Planning Commission shall evaluate each proposed use in order to consider its impact on the City. No Conditional Use Permit shall be granted within the Main Street Specific Plan boundaries unless the Planning Commission makes, in addition to those findings required in the Zoning Code, Section 28-2503 and 28-2504, all of the following findings:

a) The proposed use is consistent with the intent and purpose and Vision established for the Main Street Specific Plan.

b) The proposed use does not conflict with the Specific Plan's goal to establish and maintain a balanced mix of uses that serve the needs of both local and non-local populations.

c) The use will contribute to the unique character of Main Street and the qualities that provide the Main Street a sense of identity.

d) The proposed use complies with all applicable City Council policies, such as the policies the Council has adopted concerning alcohol serving uses.

3. BUILDING AND DESIGN PROVISIONS

In preparing the Specific Plan, an urban design analysis of the Main Street area was conducted. This study suggested that the following factors are important ingredients in maintaining the small town village charm and a pedestrian scale:

- ✓ Transparent storefronts with views into shops, offices and restaurants.
- ✓ Building facades located near the street property line.
- ✓ Continuous street side facades from side lot line to side lot line.
- ✓ Screening of parking lots from the pedestrians' way.
- ✓ Building facades limited to 35-50 feet in width.
- ✓ Eclectic architecture without national trademark buildings.
- ✓ Low one and two story buildings.
- ✓ Signs in keeping with the pedestrian scale and atmosphere.

Although many communities would use these factors to establish a design review process, the Main Street Specific Plan takes a different approach. Specific design criteria are established to be implemented as part of a ministerial permit process.

POLICY 2. Create New General Provisions for Lot Size, Open Space, Bulk and Yards (C-SP Zone, Section 28-1253)

Section 28-1253. General Provisions, Lot Size, Open Space and Yards.

1) Minimum Lot Size:
Width: . . . . . 25 feet
Depth: . . . . . 110 feet
Area: . . . . . 2,750 square feet

2) Yard Dimension (minimums):
Abutting Front Street: 0*
Abutting Side Street: 0*
Abutting Rear Street: 0*
Abutting Side Alley: . . . . . 4 feet
Abutting Rear Alley: . . . . . 22 feet
Not Abutting Street or Alley on Side: 0*
Not Abutting Street or Alley on Rear: . . . . . 10% lot width; 5 ft. min./10 ft. max.*

* Where a property has a front, side or rear yard on a block face with residentially zoned properties, the minimum dimensions for required front, side, or rear yards for the property shall be the same minimum dimensions as required in the residential zone. Notwithstanding the foregoing, uses with loading zone requirements do not have to provide the minimum dimensions required for residential zone rear yards where such loading zone conflicts with such minimum requirements.

3) Lot Coverage: 75%

4) Maximum Height, Main Building: . . . . . 30 feet maximum

Any portion of structure greater than 20 feet in height must be set back from street facade a minimum of 10 feet.

5) Maximum Height, Accessory Building: . . . . . 15 feet

6) Minimum Required Landscape: . . . 0% of the site, plus one (1) tree for each five (5) parking stalls distributed throughout any on-grade parking lot area.

   If parking area abuts the front or side street(s), a landscape area averaging 3 feet in width shall be required between such parking area and sidewalk(s) subject to the approval of the Director of Development Services. Such area shall include a minimum of one tree for each 30 ft. of linear landscape area plus landscaping and/or wall to a height of 2.5 feet designed to screen the automobiles from the sidewalk. In no case shall the landscape area be less than 1 foot in width.

7) Lot Area Standards: . . . Smaller parcels shall not be merged for development purposes into a parcel that exceeds 6,000 square feet. Notwithstanding the foregoing, development may be permitted on parcels that exceed 6,000 square feet as of the effective date of this Article.

POLICY 3. Building and Design Provisions

Section 28-1254. Design Provisions.

1) All buildings shall meet the following design criteria:

a) Transparency:

At sidewalk level, buildings shall be primarily transparent. A minimum of 50% of all first floor facades with street frontage shall consist of pedestrian entrances, display windows or windows affording views into retail, offices, gallery or lobby space. The building wall subject to transparency requirements shall include the portion between three feet and ten feet above the sidewalk. Blank walls should be avoided and lively facades encouraged.

b) Glass:

All glass in windows and doorways shall be clear for maximizing visibility into stores. A minimal amount of neutral tinting of glass to achieve some sun control is acceptable if the glass appears essentially transparent when viewed from the outside. Opaque and reflecting glass shall not be used.

c) Window Security Bars:

Window security bars shall only be allowed if installed on the interior of the window area.

d) Facade Set-Back:

Buildings shall be located on or within 4 feet of the street property line. Exceptions shall be: a) outdoor restaurant seating areas or b) areas where abutting buildings are, as of the effective date of this Article, set back creating in effect continuous store frontages with a

wider sidewalk. In the latter case, the abutting buildings' set back shall be considered the equivalent of the property line.

e) Facade Continuity:

Building street facades shall be continuous from lot line to lot line. Parking or loading areas shall not abut Main Street or Ocean Avenue frontages.

f) Facade Width:

Facades of interconnecting buildings should retain their individual identity. Buildings should not be remodeled or painted to give the appearance of a single building. Any street side building facade exceeding 50 feet in width shall be segmented into individual designs not exceeding 50 feet in width.

g) Trademark Buildings:

Trademark buildings used to house a franchise operation shall be prohibited.

2) All new sidewalks or sidewalk replacements shall be constructed utilizing a textured sidewalk material in a pattern or design representing no less than 50% of the sidewalk surface.

Section 28-1258. Roof-Mounted Mechanical Equipment

Roof-mounted mechanical equipment shall be architecturally screened to the satisfaction of the Director of Development Services.

POLICY 4. Signs

Section 28-1804, Subsection 3. Permitted Signs

3. C-0, C-SP, C-1 and C-2 Zones. The following signs are permitted in the C-0, C-SP, C-1 and C-2 zones:

   a) One unlighted sign pertaining to the sale, lease, or rental of the property on which the sign is displayed.

Parcel Size	Sign Size
Lots of record and parcels not exceeding:	
10,000 square feet	6 sq. ft.
10,000 square feet to 1 acre	25 sq. ft.
More than 1 acre	50 sq. ft.

   b) Political signs, when they pertain to an election, shall be placed no earlier than thirty days prior to the election to which they pertain. Signs posted on a building face or in a window shall not exceed thirty-six inches by forty-eight inches. Said signs shall be removed within seven days after the election.

   c) Construction signs under the same restrictions as Section 28-1804 (1) (d);

   d) For each shopping center, identification signs are permitted as follows:

      1) One free-standing or pole identification sign containing the name and logo of the center. Sign not to exceed fifteen feet in overall height and not to exceed sixty square feet on one face of a double-faced sign;

2) One monument sign not to exceed ten square feet in area and not to exceed four feet in height at each traffic entrance to the center, in no case shall more than four monument signs be placed in any shopping center.

e) Each commercial activity may have signing identifying the activity on the premises as follows:

1) One sign per building face which is visible from streets or parking lot area. Said sign to be fascia or wall sign.

2) Size of fascia or wall sign shall be one square foot per lineal foot of building face, not to exceed one hundred square feet per sign.

3) In lieu of one or more fascia or wall signs, one free-standing or pole sign not to exceed fifteen feet in overall height may be erected on the parcel or building site on which the building is located. Maximum size of sign shall not exceed sixty square feet per face of a double faced sign. Free standing or pole signs are prohibited in the C-SP zone.

4) In case of buildings having less than twenty-five linear feet of frontage on a street, twenty-five square feet of signing will be permitted.

5) In cases where a business is located on a street with a speed limit of thirty-five mph or more, a free standing sign or larger fascia or wall sign will be permitted. The larger may be an additional one-half square foot per lineal foot of building frontage not to exceed eighty additional square feet. (See subparagraphs 1, 2, 3, above). The maximum sign area per sign of one hundred square feet does not apply in this case.

6) No more than two items of information will be permitted per sign. An example of one item of information would be the name of the business, specialty item, unique service, etc.

7) Projecting signs shall be allowed in the C-SP zone subject to the following conditions:

a. "Projecting sign" means an attached sign (other than a flat-mounted sign) which projects out from a building or structure and usually has two message surfaces. If such sign projects over a public right-of-way, it is subject to Paragraph 7d.

b. Projecting signs shall be allowed that:
- do not exceed four (4) square feet in area per side;
- project no more than three (3) feet from the wall to which attached;
- are located at least seven (7) feet but not more than twelve (12) feet above grade; and
- are not illuminated or illuminated by external lighting.

c. Each ground-level occupancy frontage may have one (1) such projecting sign if such sign is located near its primary entry way. Such sign shall be in addition to signs allowed in Section 28-1804 3e.

d. No sign shall project into any public right-of-way unless the Director of Public Works shall have first issued an encroachment permit therefor.

f) When property falls under an adopted planned sign program the above provisions do not apply."

4. PARKING AND TRAFFIC

A. Parking

In 1994 there were 751 parking spaces as shown in Table 3 generally available for commercial uses within the Specific Plan area.

TABLE 3

Parking Inventory Summary

On Street (Public)	
Main Street	163
Ocean, Central & Electric (between 8th and 10th)	94
Off Street and Alleys parallel to Main St. (private)	415
Off Street (public)	
Electric Avenue	37
Main Street	42
Total	**751**

In addition to this, there are 425 spaces in the beach lots and 58 spaces in the City employee lot on 8th Street.

Parking demand in 1994 was calculated in two ways. Based on the zoning, the 223,600 square feet of commercial activities would theoretically require 1,258 spaces.

The second method was to look at actual parking demand.

Parking counts were completed each hour during the mid-day (noon to 2:00 PM) and evening (6:00 PM to 9:00 PM) peak periods on April 9, 1994 (Saturday,

non-peak season) and on July 2, 1994 (Saturday, peak season, July 4th weekend). These counts are shown in the Appendix of the Background Report.

The parking counts indicate that the majority of the on-street parking spaces in the study area, as well as the parking in the public parking lots adjacent to Main Street are occupied during peak periods. However, parking in the beach lot is generally under utilized, with 48 percent of the parking spaces vacant at 1:00 PM on Saturday, July 2, 1994, which was when the peak parking demand for the beach lot was observed. After 6:00 p.m., 77% of the parking spaces in the beach lots were vacant. Additionally, parking spaces in the alleys are generally under-utilized.

There are 36 short-term (24 Minute) parking spaces designated at key resident serving commercial locations on Main Street, with a two hour time limit for the remainder of the parking on Main Street. On the surrounding residential streets there is typically a one hour time limit on one side of the street, with no parking restrictions on the other side. However, there is a one hour parking time limit on both sides of Tenth Street and on both sides of Eighth Street south of Electric Avenue.

In light of their proximity to and support of area businesses, the curb spaces on Main Street, and in the 800 and 900 blocks along Ocean Avenue, Central Avenue, and Electric Avenue are primarily commercial parking spaces. The remainder of the on-street parking in the residential areas primarily supports the adjacent residential uses.

Annual parking passes for the beach lot are sold to Seal Beach Residents and non-residents. Further, Unocal (off-shore oil) uses the beach lot and pays via a key card. A sports fishing boat operating off the end of the pier also has a key card to use this lot. Automobile parking fees for the beach lot vary between summer and winter, and weekends and holidays.

The City's residential parking permit program allows residents to purchase a permit that allows their vehicle to park more than one hour on residential streets with one hour parking restrictions. The permit also allows them to park in the municipal parking lots on Main Street and on Eighth Street at Central Avenue

between the hours of 12:00 AM and 6:00 AM, only. The City also issues guest parking permits with the same parking regulations.

Merchants and employees in the Old Town area can buy an annual parking permit that allows them to park in the City parking lots. The permit is to be permanently affixed to the outside of the vehicle on the left rear window or bumper. The merchant permits are not resalable or transferable.

In 1984, the City began an "interim in-lieu parking program" in connection with a variety of zoning variances along Main Street. Participants were required to pay $100/year/space on an interim basis pending development of a more detailed program. According to the approval conditions these in-lieu fees may be increased. In 1994 this fund was generating $19,600 a year in funds to the City.

More recent permits have been negotiated as part of development agreements. These have been fixed fees based on $3,500/parking space, generally paid over several years. Additionally, the California Coastal Commission has required four businesses to lease 72 other non-commercial spaces for commercial use.

Based on the parking analysis, the 1994 parking demand and supply is considered in relative balance. However, there is a need to provide additional conveniently located parking to serve Main Street and to provide a base for future parking need. Most significantly, the parking analysis indicates that the primary parking problem in the Specific Plan area is the location and management of the existing parking supply and not an overall shortage of parking.

However, as existing buildings are expanded, or new uses are established which would require more parking than existing uses, there will be an increased demand for parking. Since the existing commercial lots on Main Street have inadequate room for new parking, the only likely solution to parking needs is a City in-lieu parking program.

B. Traffic

Roadways in the Specific Plan are typically two-way with a single travel lane plus a parking lane in each direction. Main Street has diagonal parking along most of

its length, except for some parallel spaces in the 300 block, which provides enough width for two lanes for traffic traveling northeast on the approach to the traffic signal at Pacific Coast Highway. A traffic signal also exists at the southwest end of Main Street at Ocean Avenue, and four-way stops are posted at the intersections with Central and Electric Avenues. Mid-block pedestrian crosswalks have been striped in all three Main Street blocks.

Electric Avenue has a broad, linear landscaped median, resulting in two one-way roadbeds. The two roadways merge at Main Street to form a single intersection. Each roadbed provides a single travel lane and a bike lane, plus parking at the right curb.

The majority of the traffic entering the study area travels southwest on Main Street from Pacific Coast Highway. Generally, if a motorist can not find a parking space near their desired destination as they travel along Main Street, they will turn at Ocean Avenue and travel up Eight or Tenth Street and then re-circulate down Main Street.

September, 1993 traffic counts indicated average daily traffic in the vicinity of Main Street as 9317 on Main Street, Ocean 4070, Central 3018, and Electric 3660. Using these counts, all streets would be operating at a high Level of Service with the exception of Main Street. However, Main Street is considered a combination parking and traffic street and a high level of traffic service is not anticipated.

Traffic flow and traffic control is not perceived to be a problem in the Specific Plan area.

POLICY 5. Parking Standards

Section 28-1255. Parking and Loading Space Requirements.

1) Off-street parking spaces shall be a minimum of nine feet by twenty feet. A minimum driver aisle width shall be provided as follows:

90 degree Right Angle Parking . . . . . 24 feet
60 degree Angle One-Way Traffic . . . . . 18 feet
45 degree Angle One-Way Traffic . . . . . 12 feet
0 degree Parallel One-Way Traffic . . . . . 12 feet

2) All parking areas shall be paved with portland cement concrete or asphaltic concrete.

3) Parking requirements shall be satisfied in one or more of the following ways:

   (a) By providing required off-street parking spaces on the property on which the building is located;

   (b) By providing required off-street parking spaces within three hundred feet of such building.

   (c) Through participation in the City's in-lieu parking program as established in Section 28-1257.

4) No use shall be established unless there is full compliance with the off-street parking requirements set forth herein or the in-lieu parking program set forth in Section 28-1257.

5) No onsite loading area is required.

Section 28-1256. Number of Off-Street Parking Spaces Required.

1) Beauty salon; Nail shop . . . . . 2 spaces per each operator.

2) Business Offices . . . . . 1 space for every 300 sq. ft. gross floor area.

3) Coffee houses; Dessert shops . . . . . 1 space for each 500 sq. ft. gross floor area or part thereof.

4) Financial Institutions;
Professional Offices . . . . . 1 space for every 250 sq. ft. gross floor area.

5) Furniture Stores . . . . . 1 space for every 1000 sq. ft.gross floor area.

6) Grocery stores . . . . . 1 space for each 1000 sq. ft. gross floor area or part thereof.

7) Hardware Stores . . . . . 1 space for each 1000 sq. ft. gross floor area or part thereof.

8) Horticultural Nursery . . . . . 1 space for every 2500 sq. ft. of lot area.

9) Medical Offices . . . . . 1 space for every 200 sq. ft. gross floor area.

10) Movie Theaters . . . . . 1 space for every 6 seats.

11) Offices Not Providing Customer
Service on the Premises . . . . . 1 space for every four employees or 1 space for every 500 sq. ft. gross floor area (whichever is greater).

12) Pharmacy; Drug stores . . . . . 1 space for each 1000 sq. ft. gross floor area or part thereof.

13) Restaurants . . . . . 1 space for every 100 sq. ft. gross floor area.

14) Retail stores . . . . . 1 space for each 500 sq. ft. gross floor area or part thereof.

Section 28-1257. In-Lieu Parking Program.

A. Participation in Program Required: In the event a use cannot provide the off-street parking spaces required by Section 28-1255 and Section 28-1256, such use shall not be established unless there is full compliance with all the requirements of the Main Street In-Lieu Parking Program as established in this Section. All or part of off-street parking space requirements may be satisfied by compliance with this Section.

B. In Lieu Parking Fee: The In-Lieu Parking Fee and the formula for calculating said fee shall be established by Resolution of the City Council.

C. Existing Uses - Parking Deficiencies: Any use which pre-exists the effective date of this ordinance and which is presently operating under the authority of a discretionary land use entitlement and/or development agreement shall remain subject to the terms and conditions of said approval and agreement. As a condition to those entitlements, the applicants agreed to participate in any in-lieu program established by the City Council. This Article constitutes the in-lieu parking program referenced in the resolutions conferring those entitlements and in those certain development agreements.

D. Processing In-Lieu Parking Program Applications:

1. Eligible persons or businesses desiring to participate in the In-Lieu Parking Program established herein shall submit a written application for participation to the Director of Development Services on a form prescribed by the City. If the Director determines that such application meets the requirements set forth in Sections 28-1255, et seq. of this Code, the Director shall, within thirty (30) days of the completion of such application, calculate the applicable in-lieu fee and grant permission to participate in the program, if the Director makes the following findings:

   (a) Participation in the In-Lieu Parking Program will not create any significant adverse traffic safety impacts, pedestrian-vehicle conflicts, or parking impacts.

(b). Participation in the In-Lieu Parking Program will not be detrimental to the public health, safety, and welfare.

2. The Director may deny the request to participate in the program, if the Director is unable to make the findings set forth in subsection 1.

3. The Director may restrict the applicant's participation in the program, if the Director determines that such restriction is necessary to make the findings set forth in subsection 1.

4. The Director's decision shall be in writing, and shall be served upon the applicant by certified mail, return receipt requested.

E. Appeals: The decision of the Director may be appealed to the Planning Commission by any aggrieved person, in the time and manner provided in Article 29.4 of Chapter 28 of the Code.

F. Payments and Deposits:

1. Payments of In-Lieu Parking Program Fees shall be made pursuant to the schedule adopted by Resolution of the City Council. In no event shall a certificate of occupancy be issued for any participating use in the Main Street Specific Plan Zone prior to the receipt by the City of the first installment or, if applicable, full payment of the In-Lieu Parking Fee.

2. Funds collected from the In-Lieu Parking Program shall be deposited in a segregated City In-Lieu Parking Program fund. Such fund shall be used exclusively for the purpose of promoting, managing, operating, increasing and maintaining the availability of parking spaces in the immediate vicinity of Main Street.

G. Transferability: In-Lieu Parking space payments paid for pursuant to the provisions of this ordinance shall be credited only to the use for which participation was granted, and shall not be assigned or otherwise transferred for use on any other property.

H. Expansion, Intensification or Change in Use to a Use which Requires Additional Off-Street Parking Spaces: Should the use of any property within the Main Street Specific Plan Zoning be proposed for expansion, enlargement, structural alterations, intensification or conversion to a new use which requires additional off-street parking spaces, the owner, lessee or sublessee of the property shall provide the required additional off-street parking, either on-site, within 300 feet of the property on which the building is located, or through payment of in-lieu parking program fees, or additional in-lieu parking program fees, as required by this Article.

I. Acceptance of Terms and Provisions: An applicant's participation in the program shall not become effective, and a certificate of occupancy shall not be issued, unless and until the participant first executes and submits for recording on the title to the property a covenant accepting the terms of the approval, in a form to be provided by the City Attorney. Said covenant shall be recorded in the office of the Orange County Recorder and shall also be maintained in the office of the City Clerk.

J. Violators Punishable by Fine and Imprisonment: Any person, firm or corporation violating any of the provisions of this article is guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine of not more than five hundred dollars or by imprisonment in the county jail for a period of not more than six months, or both such fine and imprisonment.

Section 28-2408. Nonconforming Nonresidential Buildings and Uses May Not Be Enlarged or Structurally Altered

C. Where a building or buildings located within the Main Street Specific Plan area are nonconforming only by reason of an inadequate number of parking spaces, the provisions of this chapter prohibiting enlargements, structural alteration or expansion shall not apply, provided:

1. that any enlargements, structural alterations, or expansion shall not further reduce the existing number of parking spaces, and

2. new parking spaces shall be supplied to meet the parking requirements for the difference in building area between the existing building and new building, and

3. new parking spaces shall be supplied to meet the difference in parking requirements for the existing building between the prior use and the new use.

Where property owners cannot meet off-street parking requirements, permits may be granted if said owners instead pay an in-lieu parking fee pursuant to the provisions of Section 28-1257.

POLICY 6. Parking Management Plan

Although parking studies can establish theoretical demand, the actual demand for parking and behavior habits of parkers cannot be totally determined and changes over time. Therefore, the City shall establish a parking management plan. Such a plan should include, but not be limited to:

a) Conducting and analyzing an annual parking count for the Specific Plan area, similar to the one prepared for the Specific Plan;

b) First Phase — Management Improvements:

- ✓ Limit the 24 minute parking restrictions to the 7:00 a.m. to 6:00 p.m. period except for spaces serving resident oriented businesses that stay open past 6:00 p.m.

- ✓ Change the merchants' parking permit program to only allow parking in the beach lots.

- ✓ Increase enforcement of the parking restrictions for all parkers to emphasize a consistent and fair enforcement program.

- ✓ Work with the merchants to conduct a program so that employees do not park in street curb spaces.

- ✓ Allow public parking in the 8th Street lot after 5:00 p.m. and on Saturdays, Sundays and holidays and post appropriate signs to this effect.

- ✓ Analyze City employee parking needs at the 8th Street lot and open any non-needed spaces to the public.

- ✓ Change the beach lots from a flat fee to an hourly fee, offer a merchant validation program, and explore use of the lots for a merchant valet program.

- ✓ Improve signage to the beach lots.

- ✓ Formalize the in-lieu parking program in conformance to AB 1600 requirements.

c) Second Phase — Management Improvements:

- ✓ Adjust beach parking lot rates depending upon the result of parking surveys. If usage remains low, lower the rates. If usage reaches an average occupancy of 85%, raise the rates.

- ✓ Conduct a license plate analysis to determine the number of curb-side parkers who move their cars every two hours or rub off the chalk. If this is a problem, adopt a computerized system that records license plate numbers for enforcement.

- ✓ Improve pedestrian amenities, access and directional signs to the beach lots.

- ✓ Consider parking meters in the public parking lots located in the 100 and 300 blocks of Main Street.

d) Third Phase — Management Improvements

- ✓ Construct a two level depressed parking structure on the 8th Street lot adjacent to the Fire Station.

- ✓ Look for opportunities to purchase land between 8th and 10th Streets between Ocean Avenue and Electric Avenue for future surface parking. The target cost should be less than $15,000 / space.

- ✓ Consider parking meters for curbside spaces on Main Street.

5. PUBLIC FACILITIES

A. Street Trees

A key feature of pedestrian oriented streets and sidewalks are street trees. The three blocks of Main Street have 50 street trees which provide an appropriate atmosphere for much of the street. However, there are important gaps on both sides of the street. In addition to trees missing in front of commercial establishments, there is a lack of continuity of street trees on both sides of Main Street as it crosses Electric Avenue.

The trees being used on Main Street were not planted with root barriers and the type of tree being used has invasive roots that creates problems with the sidewalks.

POLICY 7. Tree Types

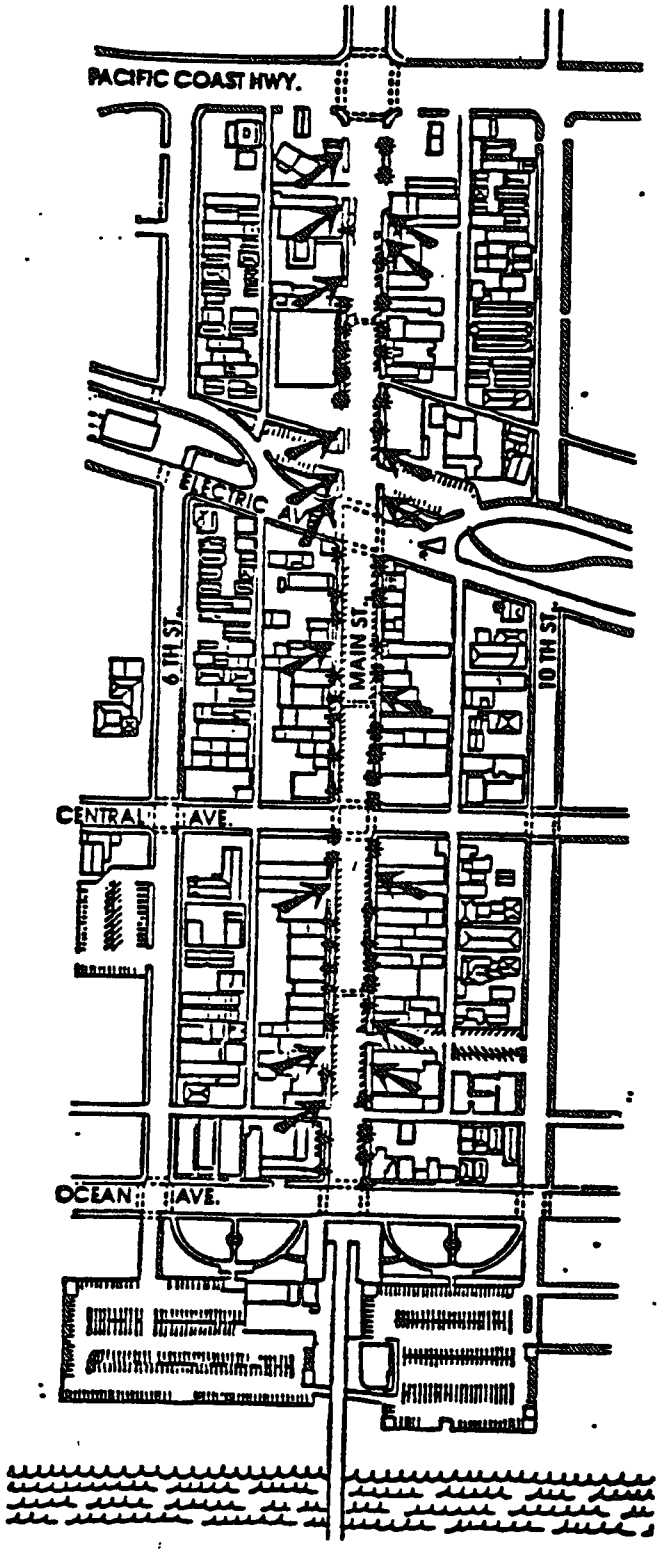
The City should hire a landscape architect to recommend a tree type and planting methods for Main Street. The trees selected should grow to have substantial canopies, equal to or greater than the existing mature trees on Main Street.

POLICY 8. Missing Trees

The City and/or private interest should plant an additional 18 trees as shown in Figure 2.

POLICY 9. Tree Replacement

When existing trees need to be replaced due to damage or sidewalk problems, trees should be replaced consistent with the findings of Policy 7 and 12.



LEGEND

EXISTING STREET TREES

AREA IN NEED OF STREET TREE

SCALE

0 100 200 300 400

FIGURE: 2

STREET TREES

ZUCKER SYSTEMS

B. Utility Lines and Poles

Most of the electric utilities in the area are either underground or located in alleys. There are two areas where overhead utilities are particularly noticeable. One is a series of poles and lines leading off the 100 block of Main Street, another is along Electric Avenue.

POLICY 10. Undergrounding of Utilities

The City should adopt a long term plan to underground utilities in the Specific Plan area. Priorities should be:

1st — Poles and lines in the 100 block

2nd — Poles and lines along Electric Avenue

3rd — Other poles and lines in the area

C. Benches

In 1994 there was an eclectic mix of bench designs on Main Street; some located next to buildings, some next to the curb. The eclectic mix of bench designs adds to the small town flavor of Main Street. The City issues permits for benches but the merchants buy their own benches and the City approves the bench design.

POLICY 11. Benches

Merchants shall be encouraged to add additional benches to Main Street since they add to the pedestrian scale and atmosphere. All bench designs shall be approved by the City and the appropriate encroachment permit shall be obtained from the City.

D. Street Lighting

Street lighting on Main Street is supplied by Southern California Edison. The lighting level as of 1994 is considered adequate. Decorative lights are placed in the trees during the Christmas holidays.

POLICY 12. Street Lighting

Year round lights in the Main Street trees should be undertaken as a joint project of the Main Street merchants and the City.

E. Bicycle Facilities

In 1995 there was an eclectic mix of bicycle racks on Main Street; some located next to buildings, some next to the curb. The eclectic mix of bicycle racks adds to the small town flavor of Main Street.

POLICY 13. Bicycle Facilities

Merchants shall be encouraged to add additional bicycle racks along Main Street. All bicycle rack designs and locations shall be approved by the City, and the appropriate encroachment permit shall be obtained from the City.

F. Landscaping

Parking lots should be landscaped and also be separated from the sidewalks by landscaping. In 1994, the City's Electric Avenue parking lots met this standard, but the lot in the 100 block of Main Street and the 8th Street lot did not.

POLICY 14. Parking Lot Landscaping

The City should landscape the lot in the 100 block of Main Street and 8th Street parking lots.

G. Signs on Public Sidewalks

Some businesses along Main Street currently have sidewalk signs for business identification and advertising purposes. Properly controlled and designed, these types of signs can be beneficial to both the local business community, visitors to Main Street and the City. However, the current City Code prohibits such signs.

POLICY 15. Signs on Public Sidewalks

The City should amend the City Code to allow selected sidewalk signs within the Main Street Specific Plan area. All such signs shall be approved by the City and the appropriate encroachment permit shall be obtained from the City.

H. Other Public Facilities

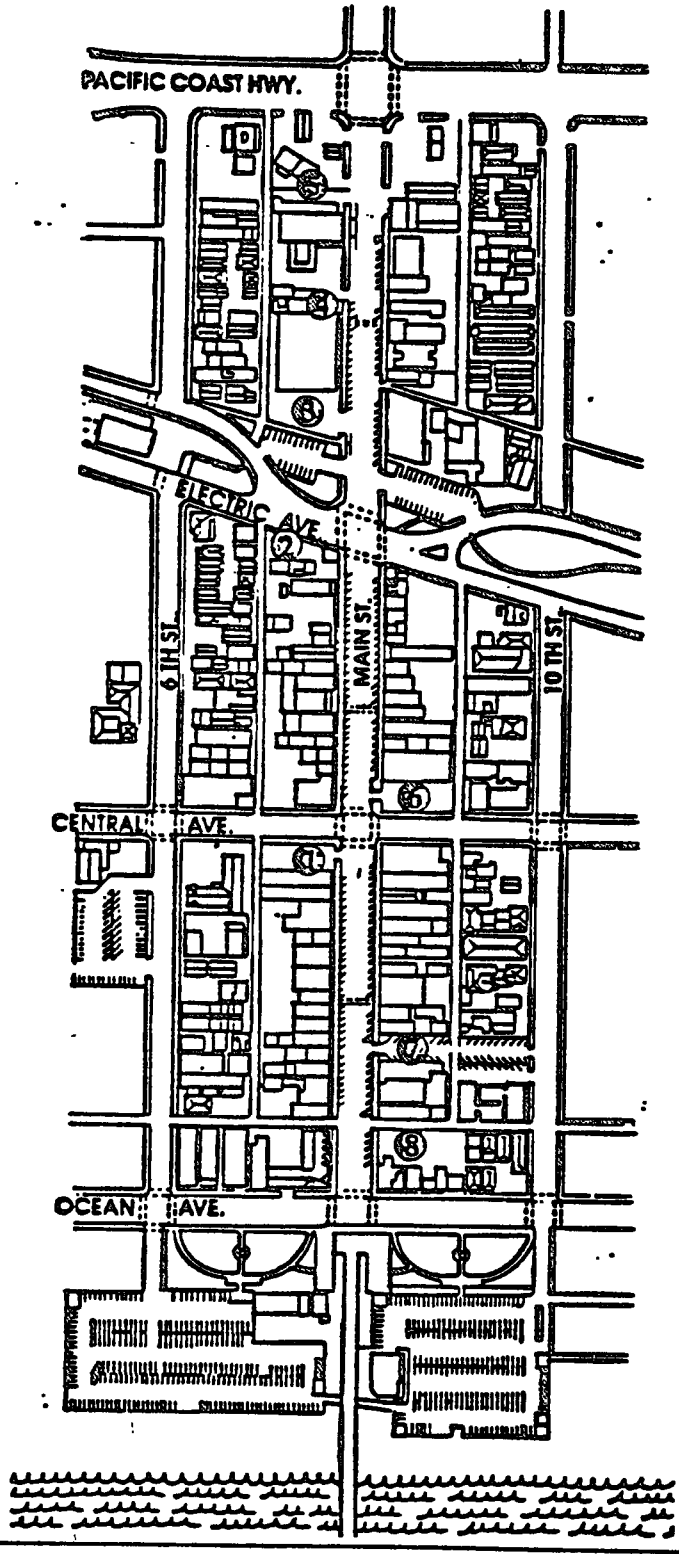
Since no extensive new construction is contemplated by this Specific Plan, the City will continue to utilize existing services for sewage, water, drainage, solid waste disposal and energy.

6. SCREENING OF PRIVATE PARKING LOTS

When creating a pedestrian atmosphere, it is generally useful to screen parking lots from pedestrians. Screening can be accomplished by a low wall or hedge or a landscape strip and trees between the pedestrian way and the parking area. Where space is particularly tight, bollards can also be used to separate parking areas from pedestrian sidewalk areas. Eight parking lots on Main Street, as shown in Figure 3, lack the appropriate screening feature.

POLICY 16. Screening of Parking Lots

The City should develop a program to encourage owners of parking lots located on Main Street to screen their parking lots from the pedestrian ways. The City should also explore the possibility for design assistance grants or low cost loans as an incentive for owners to improve their lots.



LEGEND

PARKING LOTS THAT NEED SCREENING FROM PEDESTRIAN WAY

SCALE

0 100 200 300 400

FIGURE: 3
PARKING LOT SCREENING

ZUCKER SYSTEMS

7. DOWNTOWN MANAGEMENT

The goal of the Main Street Specific Plan is to set clear standards for Main Street. Under these standards, merchants and property owners can proceed with improvements in a timely fashion and residents can feel comfortable about Main Street development. Nevertheless, it is unrealistic to assume that standards, once set, can remain the same for all time. Since circumstances can change, it is important to monitor Main Street's evolution over time.

The adoption and implementation of the Main Street Specific Plan can provide a major impetus for downtown revitalization. However, most communities involved with downtown revitalization have found that focusing on land use, circulation and design can be most effective when coupled with an additional emphasis on organization, promotion and economic restructuring. Such activities are strongly encouraged by the City to be undertaken by the local business community on a voluntary basis.

POLICY 17. Business Improvement Activities

The local business community may wish to develop on a voluntary basis additional organizational, promotional, economic restructuring, and improvement programs. Such voluntary activities of the local business community could include:

Organization:	Building consensus for action. Seeking cooperation from all parties. Providing long-term management and planning.
Promotion:	Advertising downtown as a place to shop, invest and live.
Economic Restructuring:	Recruiting businesses or developers to fulfill specific downtown needs and assisting existing businesses through business seminars and the like.
Improvements:	Trees, lighting, sidewalks, undergrounding utilities, and signs.

POLICY 18. Bi-Annual Main Street Review

Every two years the City should prepare a Main Street review. Said review should include an analysis of:

a. Sales tax trends
b. Store vacancies
c. Store turnovers
d. Parking as per Policy 6
e. Report from the Main Street business community

Based on an analysis of this report, the City should determine what, if any, additional actions are appropriate to carry out the intent of the Specific Plan. This review should be presented before the City Council at a noticed hearing.

8. RELATION OF THE SPECIFIC PLAN TO THE GENERAL PLAN

The Main Street Specific Plan carries out the objectives of the Seal Beach General Plan. It specifically carries out the following:

a. **Goal 3. Parks, Recreation and Community Beautification; Land Use Element, Page 4**

> **"A master plan should be developed for street tree planting and other community beautification programs with emphasis on major arterials entering the City."**

This item is carried out through the Specific Plan's street tree program as described in Policies 7, 8 and 9.

b. **Goal 6. Commercial; Land Use Element, Page 5 (as amended)**

> **"A precise specific plan should be developed for the coastal business district."**

This Specific Plan includes the coastal business district and thus implements this goal.

c. **Goal 9. Circulation; Land Use Element, Page 6**

> **"Efforts should be made to improve traffic circulation in the Coastal section of the City."**

The Specific Plan land use and parking proposals should assist traffic circulation. More specifically, the land use policies coupled with the parking and traffic policies set appropriate parking standards for various uses. Where parking standards cannot be met, they are mitigated through a fee program.

d. Commercial Land Use, Page 22

"The Main Street commercial serves both local residents and, to some extent, beach going people from other areas. The diversity in market attraction of the various commercial areas indicates that each area should be treated differently than any of the others due to the particular clientele of each."

This item is carried out in the Specific Plan by recognizing Main Street as a unique area. Specific unique land use tables are included in Policy 1, special design features are included in Policies 2, 3 and 4, and new commercial parking and loading requirements in Policies 5 and 6.

e. 3.2 Proposed Service Commercial Uses

"The proposed Land Use Element would continue the Seal Beach Shopping Center and the Leisure World Shopping Center as functioning service commercial uses. Main Street commercial is also proposed to be designated a service commercial use.

As pointed out earlier, the proposed new land use designation would be a name change only, because the present existing uses are of a service commercial nature.

Main Street commercial, with the attraction of the beach and the proximity of relatively high density residential, has the potential to become a unique shopping area. With strong attraction for beach users, this commercial area can and should turn to a more pedestrian-oriented environment through the design application of textured walkways, street furniture, sign graphics, landscaping, lighting, and other design features."

The Specific Plan is consistent with this language. The Specific Plan establishes special design standards for the Main Street area in Policies 2, 3 and 4 and Policies 7 through 16.

f. **3.1, 3.1c, 3.1e Civic Center Functions, Pacific Electric Right-of-Way, and Seal Beach Pier, Pages 32 and 33**

"3.1 Civic Center Functions

Civic Center functions are divided into four main categories: Administration, Police, Fire and Public Works. It is envisioned that the Administration offices will remain in the Coastal District at Eighth Street and Central Avenue, in the City Administration Building which was constructed in 1969. Fire Department services will continue to be administered from Fire Station No. 3 located on Beverly Manor Road and Fire Station No. 1 will continue to serve the portion of the City nearest to the beach."

"3.1c Pacific Electric Right-of-Way

The Pacific Electric Right-of-Way has been developed as a park allowing for uses such as open space, recreation, public facilities (e.g., library, senior citizens' center, Red Car Museum, etc.). Development was through the Specific Plan Process."

3.1e Seal Beach Pier

The Seal Beach Pier, one of the very few piers in use today along the California coastline, should be maintained as its present use to allow for both fishing and pleasure walking to enjoy ocean

amenities. Any needed repairs for the pier should be carried out so that the present use can be continued and enhanced."

The retention of the Administrative Offices and a Fire Station on Eighth Street along with the Electric Avenue Park and the Pier are all key ingredients for the Main Street area. The Administrative Offices, Fire Station, Pier and portions of Green Belt Park are included within the Specific Plan Boundary (see Figure 1).

g. Scenic Highway Element

Ocean Avenue is shown as a Local Scenic Highway and Pacific Coast Highway is shown as a Proposed Scenic Highway in the Scenic Highway Element. The Main Street Specific Plan design guidelines in Policies 2, 3 and 4 are consistent with these designations and implement scenic features.

h. 3.1d Beach Parking; Land Use Element

"Additional Coastal Area land should not be committed to beach visitor parking; instead the concept of periphery parking in the outlying areas with a transport system should be explored. The advantage of periphery parking is that beach visitors from inland Orange County could be intercepted and then transported to the beach via a tram/minibus system, thus alleviating traffic congestion directly adjacent to the beach."

The Main Street Specific Plan is consistent with this language. No new beach parking is proposed within the Specific Plan area. Better use of existing parking is proposed in Policy 6 through a parking management plan.

i. 3.1e Seal Beach Pier; Land Use Element, Page 33

"The Seal Beach Pier, one of the very few piers in use today along the California coastline, should be maintained as its present use to allow for both

fishing and pleasure walking to enjoy ocean amenities. Any needed repairs for the pier should be carried out so that the present use can be continued and enhanced."

The Main Street Specific Plan is consistent with the importance of maintaining the Seal Beach Pier. The Plan does not specifically make any changes to the Pier.

j. 1.3 Central Business Commercial Area Along Main Street; Land Use Element, Page 8

The language in this section concerning Main Street is the same as the Main Street Specific Plan Vision Statement, see Page 1 of the Specific Plan.

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1111 Town & Country Road, Suite 34
Orange, California 92868
(714) 973-8383

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