Appendix B

Transportation Impact Analysis

Morena Corridor Specific Plan

Transportation Impact Analysis

Draft Report

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Table of Contents

Appendices

List of Tables

List of Figures

1.0 Introduction

1.1 Purpose of the Report

This Transportation Impact Analysis (TIA) serves to identify and document potential traffic impacts related to the buildout of the High-Density and Mid-Density Alternatives associated with the Morena Corridor Specific Plan, as well as to recommend improvements/mitigation measures for any identified roadway, intersection and/or freeway impacts. A qualitative analysis for a Low-Density Alternative is also provided.

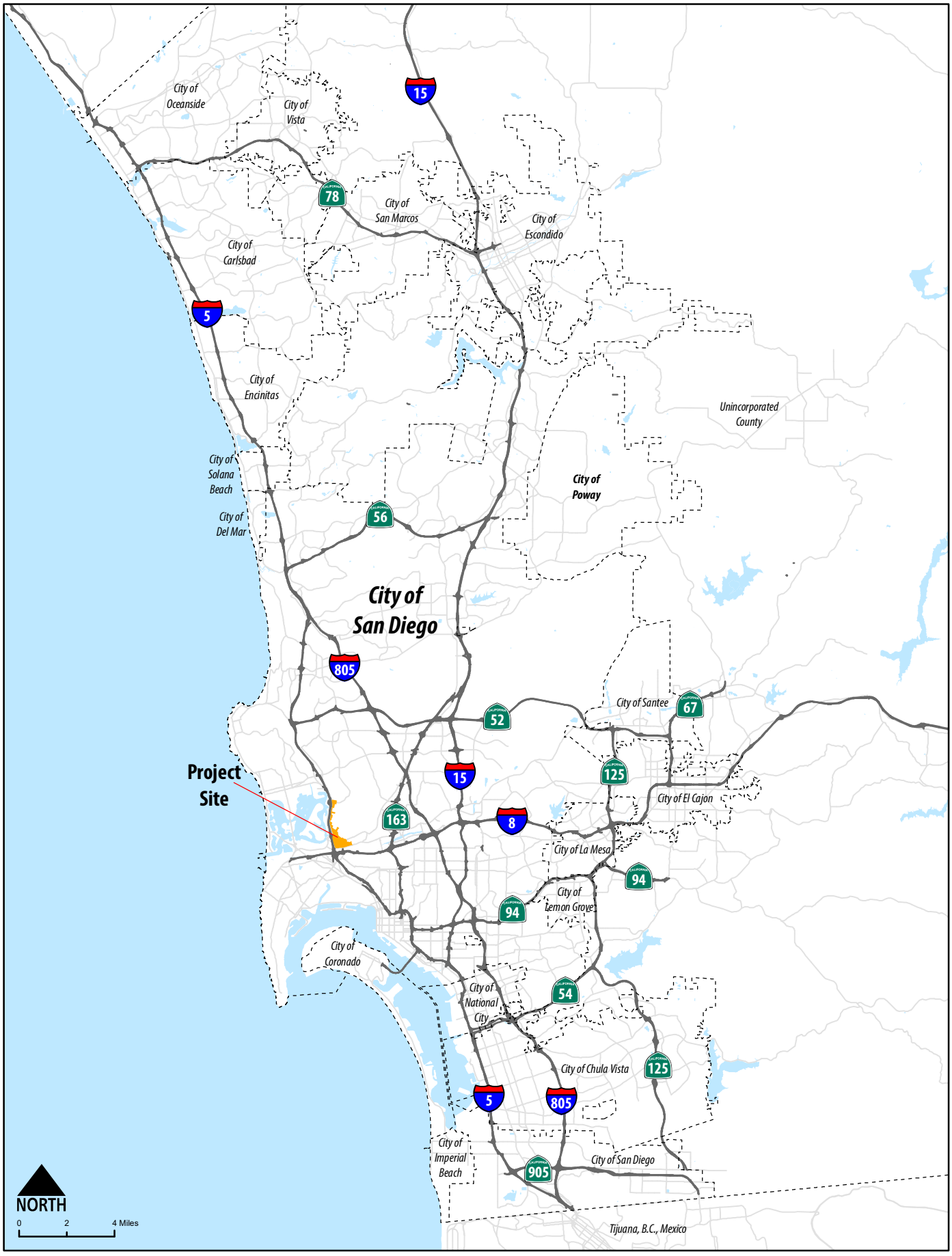
In order to assess potential impacts for EIR alternatives, this report provides comparisons of vehicle trip generation associated with land uses for the Existing Conditions, as well as buildout land uses for the Adopted Community Plan (No Project), the High-Density Alternative, Mid-Density Alternative, and the Lower-Density Alternative; and provides impact assessments for roadway, intersection and freeway operating conditions.

Figure 1-1 displays the Morena Corridor Specific Plan project study area.

Study Scenarios

Analysis results from the following scenarios are provided within this transportation impact study:

- *Existing Conditions* – Analysis results were obtained from the Morena Boulevard Station Area Plan Final Report (traffic impact study) and used to establish existing base line traffic operations within the project study area.
- *High-Density Alternative (Preferred Plan)* – This alternative analyzes the most intense proposed land use scenario. Roadway network modifications were developed in collaboration between community members, City staff, and the project consultant team, and modeled using the calibrated SANDAG Series 12 Regional Model. This customized model assumed buildout of the Preferred Plan land uses within the study area and Year 2035 land uses outside of the study communities for regional growth.
- *Mid-Density Alternative* – A full analysis was provided for a less intense land use scenario than the Preferred Plan. The roadway network for this scenario is identical to the Preferred Plan. This scenario was modeled using the calibrated SANDAG Series 12 Regional Model. This customized model assumed buildout of the Mid-Density Alternative land uses within the study area and Year 2035 land uses outside of the study communities for regional growth.
- *Low-Density Alternative* – A qualitative analysis is provided for a Low-Density Alternative, which represents the least intense land use scenario of the three. This analysis consists of a trip generation analysis and provides a comparison to Existing Conditions.
- *Adopted Community Plan (No Project)* – Buildout of the Clairemont Mesa and Linda Vista Adopted Community Plan land uses and mobility networks represent the future year no project scenario. A qualitative discussion comparing the Adopted Community Plans to the proposed Mobility Plan is provided in this chapter using roadway segment analysis results.



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Transportation Impact Analysis
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Figure 1-1
Project Regional Location

1.2 Report Organization

Following this introductory chapter, the report is organized into the following chapters:

2.0 *Analysis Methodology* – This chapter describes the methodologies and standards utilized to analyze roadway, intersection, and freeway traffic conditions.

3.0 *Existing Conditions* - This chapter describes the existing traffic network within the study area and provides analysis results for existing traffic conditions.

4.0 *Preferred Plan Mobility Network* – The Preferred Plan mobility network is presented in this chapter, which serves as the mobility network for Preferred Plan, Mid-Density Alternative, and Low-Density Alternative analyses.

5.0 *Preferred Plan Analysis* – This chapter assesses the potential traffic impacts of the Preferred Plan mobility network and land use designations by comparing the results to Existing Conditions. Trip generation, roadway segments and intersection peak hour operations, as well as freeway segments and ramp meters were evaluated. Mitigation measures for significant impacts are also identified, where applicable.

6.0 *Mid-Density Alterative* – This chapter assesses the potential traffic impacts of the Mid-Density Alternative land uses by comparing the results to Existing Conditions. Trip generation, roadway segments and intersection peak hour operations, as well as freeway segments and ramp meters were evaluated. Mitigation measures for significant impacts are also identified, where applicable.

7.0 *Low-Density Alternative* – A qualitative analysis for the least intense land use scenario is provided in this chapter, by comparing the Low-Density Alternative vehicle trip generation to Existing Conditions, the Preferred Plan, and Mid-Density Alternative.

8.0 *Adopted Community Plans* – The Adopted Community Plans' vehicle trip generation and roadway segment operations are qualitatively compared to Existing Conditions in this chapter.

9.0 *Summary* – The concluding chapter provides a comparison of the analysis results for each scenario and summarizes the identified significant impacts.

2.0 Analysis Methodology

This chapter describes the various methodologies utilized to analyze the mobility network and various land use scenarios. Analysis of the vehicular systems – roadways, intersections and freeways – were prepared for this study in accordance with the *City of San Diego Traffic Impact Study Guidelines,* SANTEC/ITE Guidelines, and the enhanced California Environmental Quality Act (CEQA) project review process.

2.1 Selection of the Study Area

This section describes the process used to identify roadway segments and intersections for analysis.

2.1.1 Roadway Segments

Roadway segments were evaluated if one or more of the following circumstances applied:

- The roadway segment was analyzed as part of the Morena Boulevard Station Area Plan Final Report (February 2014);
- The roadway segment is a circulation element roadway located within the study area;
- The roadway segment is located outside of either study community; however, it may influence or impact the flow of transportation within either of the communities.

2.1.2 Intersections

Intersections were evaluated if one or more of the following circumstances applied:

- The intersection was analyzed as part of the Morena Boulevard Station Area Plan Final Report (February 2014);
- The intersection is comprised of a circulation element roadway intersecting with another circulation element roadway.
- The intersection is at a freeway ramp interchange located within or adjacent to the study area.

Figure 2-1 displays the study intersections and roadway segments.

2.2 Level of Service Definition

Vehicular level of service (LOS) is a quantitative measure that represents quality of service for the driver. These conditions are generally described in terms of such factors as speed, travel time, freedom to maneuver, comfort, convenience, and safety. LOS A represents the best operating conditions from a driver's perspective, while LOS F represents the worst. Table 2-1 describes generalized definitions of auto LOS A through F.

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Transportation Impact Analysis
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Figure 2-1
Project Study Area Roadway Segments and Intersections

Table 2-1 Vehicular Level of Service Definitions

LOS	Characteristics
A	Primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Controlled delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	Reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	Stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Unstable operation and significant delay. Such operations may be due to some combination of adverse signal progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F	Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.

Source: Highway Capacity Manual (2000)

2.2.1 Roadway Segment Level of Service Standards and Thresholds

Roadway segment level of service standards and thresholds provide the basis for analysis of arterial roadway segment performance. The analysis of roadway segment level of service is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and existing or forecasted Average Daily Traffic (ADT) volumes. Table 2-2 presents the roadway segment capacity and LOS standards utilized to analyze roadways in this report.

These standards are generally used as long-range planning guidelines to determine the functional classification of roadways. The actual capacity of a roadway facility varies according to its physical and operational attributes. LOS D is considered acceptable for Mobility Element roadway segments in the City of San Diego. Often, a roadway segment that is analyzed to be LOS E or F based on theoretical capacity is found to operate acceptably in practice. In such cases, HCM arterial analysis may be conducted and utilized (or intersection analysis, if arterial analysis is not applicable) to provide a more accurate indication of LOS.

Table 2-2 City of San Diego Roadway Segment Daily Capacity and Level of Service Standards

Roadway Functional Classification	Lanes	Level of Service				
		A	B	C	D	E
Freeway	8	60,000	84,000	120,000	140,000	150,000
Freeway	6	45,000	63,000	90,000	110,000	120,000
Freeway	4	30,000	42,000	60,000	70,000	80,000
Expressway	6	30,000	42,000	60,000	70,000	80,000
Prime Arterial	8	35,000	50,000	70,000	75,000	80,000
Prime Arterial	6	25,000	35,000	50,000	55,000	60,000
Major Arterial	7	22,500	31,500	45,000	50,000	55,000
Major Arterial	6	20,000	28,000	40,000	45,000	50,000
Major Arterial	5	17,500	24,500	35,000	40,000	45,000
Major Arterial	4	15,000	21,000	30,000	35,000	40,000
Major Arterial	3	11,250	15,750	22,500	26,250	30,000
Major Arterial	2	7,500	10,500	15,000	17,500	20,000
Major Arterial (one-way)	3	12,500	16,500	22,500	25,000	27,500
Major Arterial (one-way)	2	10,000	13,000	17,500	20,000	22,500
Collector (w/ two-way left turn lane)	4	10,000	14,000	20,000	25,000	30,000
Collector (w/ two-way left turn lane)	3	7,500	10,500	15,000	18,750	22,500
Collector (w/ two-way left turn lane)	2	5,000	7,000	10,000	13,000	15,000
Collector (w/o two-way left turn lane)	4	5,000	7,000	10,000	13,000	15,000
Collector (w/o two-way left turn lane)	3	4,000	5,000	7,500	10,000	11,000
Collector (w/o two-way left turn lane)	2	2,500	3,500	5,000	6,500	8,000
Collector (w/o two-way left turn lane) – no fronting property	2	4,000	5,500	7,500	9,000	10,000
Collector (one-way)	3	11,000	14,000	19,000	22,500	26,000
Collector (one-way)	2	7,500	9,500	12,500	15,500	17,500
Collector (one-way)	1	2,500	3,500	5,000	6,500	7,500
Sub-Collector (single-family)	2	-	-	2,200	-	-

Source: City of San Diego Traffic Impact Study Manual (1998);
Updated with input from City of San Diego Planning Department Mobility Staff (2017)

2.2.2 Peak Hour Intersection Level of Service Standards and Thresholds

This section presents the methodologies used to perform peak hour intersection capacity analysis, for both signalized and unsignalized intersections. The following assumptions were utilized in conducting all intersection level of service analyses:

- Pedestrian Calls per Hour: Based on existing pedestrian counts.
- Heavy Vehicle Factor: A 2% heavy vehicle factor was assumed for all intersections within the study area.
- Peak Hour Factor: Based on existing peak hour counts.
- Signal Timing: Based on existing signal timing plans.

Signalized Intersection Analysis

The signalized intersection analysis utilized in this study conforms to the operational analysis methodology outlined in *2000 Highway Capacity Manual (HCM), Transportation Research Board Special Report 209*. This method defines LOS in terms of delay, or more specifically, average control delay per vehicle (sec/veh).

The *2000 HCM* methodology sets 1,900 passenger-cars per hour per lane (pcphpl) as the ideal saturation flow rate at signalized intersections, based upon the minimum headway that can be sustained between departing vehicles at a signalized intersection. The service saturation flow rate, which reflects the saturation flow rate specific to the study facility, is determined by adjusting the ideal saturation flow rate for lane width, on-street parking, bus stops, pedestrian volume, traffic composition (or percentage of heavy vehicles), and shared lane movements (e.g. through and right-turn movements sharing the same lane). The level of service criteria used for this technique is described in Table 2-3. The computerized analysis of intersection operations was performed utilizing the *Synchro 9.0 (2000 HCM methodology)* traffic analysis software (by Trafficware, 2011).

Table 2-3 Signalized Intersection Level of Service Highway Capacity Manual Operational Analysis Method

Average Control Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
≤10.0	*LOS A* occurs when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
10.1 – 20.0	*LOS B* occurs when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
20.1 – 35.0	*LOS C* occurs when progression is favorable or the cycle length is moderate. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
35.1 – 55.0	*LOS D* occurs when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
55.1 – 80.0	*LOS E* occurs when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
>80.0	*LOS F* occurs when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, Transportation Research Board Special Report 209 (2000)

Unsignalized Intersection Analysis

Unsignalized intersections, including two-way and all-way stop controlled intersections, were analyzed using the *2000 HCM* unsignalized intersection analysis methodology. The Synchro 9.0 software supports this methodology and was utilized to produce LOS results. The LOS for a two-way stop controlled (TWSC) intersection is determined by the computed or measured control delay and is defined for each minor movement. The LOS for an all-way stop controlled (AWSC) intersection is determined by the computed or measured average control delay of all movements. Table 2-4 summarizes the level of service criteria for unsignalized intersections.

Table 2-4 Level of Service Criteria for Stop Controlled Unsignalized Intersections

Average Control Delay (sec/veh)	Level of Service (LOS)
≤10.0	A
10.1 – 15.0	B
15.1 – 25.0	C
25.1 – 35.0	D
35.1 – 50.0	E
>50.0	F

Source: Highway Capacity Manual (2000)

The City of San Diego considers LOS D or better during the AM and PM peak hours to be acceptable intersection LOS.

2.2.3 Freeway/State Highway Level of Service Standards and Thresholds

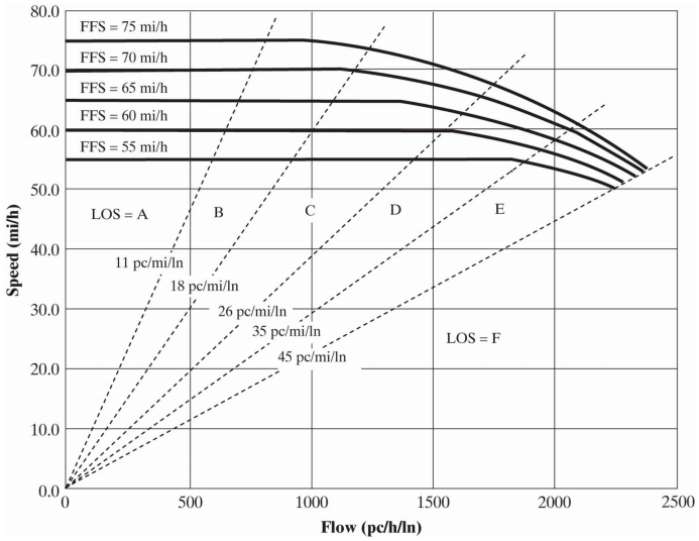
Freeway LOS analysis is based upon procedures developed by Highway Capacity Manual 2010. The procedure for calculating freeway LOS involves estimating the vehicle speed (mi/h) and density/flow (pc/mi/ln).

HCS 2010 software, developed by McTrans, was used to calculate both the vehicle speed and density/flow along the study area freeway segments. The HCS 2010 software required the following inputs to complete the speed and density/flow calculations:

- AADT – Caltrans Traffic Census 2015 AADT Volumes Report
- K – Caltrans Traffic Census 2015 AADT Volumes Report
- D – Caltrans Traffic Census 2015 AADT Volumes Report
- $AADT_{adj}$ – Calculated using AADT and D values provided by Caltrans using the following equation:
  - $AADT_{adj} = (\frac{D}{1-D})AADT$
  - represents the direction in the opposite direction of the Peak Direction
- PHF – Assumed to be a typical value of 0.95
- P_T (% Trucks and Busses) – Caltrans Traffic Census 2015 AADT Truck Volumes Report
- P_R (% RVs) – Assumed to be 0, HCM 2010 recommends grouping RV volumes with Trucks in Buses as the value is assumed less than a 5:1 ratio
- General Terrain – Assumed to be less than 2% grade and therefore Level Terrain (HCM 2010 11-16,17)
- f_p – Driver population factor assumed zero as traffic is largely commuter traffic
- E_T – Value of 1.5 as terrain is Level (HCM 2010 11-15)
- E_R – Value of 1.2 as terrain is Level (HCM 2010 11-15)
- Lane Width – Assumed 12’ maximum value by Google Earth survey
- Rt-Side Lat. Clearance – Assumed 6’ maximum value by Google Earth survey
- Total Ramp Density, TRD – Found in the Caltrans Traffic Census 2015 AADT Ramp Volumes Report

- Density calculated by total number of on/off ramps in single direction within segment length plus 3 miles in both directions, divided by the total length
- Base free-flow Speed, BFFS – Assumed 75.4 mph (HCM 2010 11-11)

Using the calculated freeway speed and density/flow, the LOS is determined using the chart to the right:



2.2.4 Ramp Metering Analysis

Ramp metering is a means of controlling the volume of traffic entering the freeway with the goal of improving freeway main lane traffic operations and flow. Freeway ramp meter analyses estimate peak hour queues and delays at freeway ramps by comparing existing volumes to the meter rate at the given location. Meter rates were obtained from Caltrans for use in the analysis. Ramp metering analyses to calculate delays at study area freeway ramps were conducted following the procedures outlined in the *City of San Diego Traffic Impact Study Manual (1998)*.

2.2.5 Determination of Significant Impacts

This section outlines the thresholds for determining significant project-related impacts to roadways, intersections, and freeways in the City of San Diego. A significant impact is identified when the addition of a project's traffic results in a level of service dropping from LOS D or better to LOS E or F. Table 2-5 summarizes the significant impact thresholds for facilities operating at substandard level of service with and without the project. Where a roadway segment operates at LOS E or F, if the intersections at the ends of the segment and a peak hour arterial analysis for the same segment result in acceptable LOS with the project; then the project impacts would be less than significant. If either the intersections or segment under arterial analysis do not operate acceptably, the impact would be significant.

Table 2-5 City of San Diego Measures of Significant Project Traffic Impacts

LOS with Project	Allowable Change Due to Impact					
	Freeways		Roadway Segments		Intersections	Ramp Metering*
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec)	Delay (min)
E	0.01	1.0	0.02	1.0	2.0	2.0
F	0.005	0.5	0.01	0.5	1.0	1.0

Source: CEQA Significance Determination Thresholds, City of San Diego Development Services Department (2007)
Note: * For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

3.0 Existing Conditions

This section describes key intersections, roadway and freeway segments, as well as existing peak hour intersection traffic volumes, and daily roadway and freeway traffic volumes. Level of service analysis results for all study area facilities under Existing Conditions are presented.

3.1 Roadway Segment Analysis

Chapter 2 documents the selection of study area roadway segments and study intersections. The roadway network is comprised of regional facilities such as I-5, as well as numerous arterials and local streets. Figure 3-1 displays the existing classification for study area roadway segments.

Table 3-1 and Figure 3-2 display existing average daily traffic volumes for study roadway segments and the resulting LOS. Traffic counts obtained from the Morena Boulevard Station Area Plan Final Report (February 2014) and validated with supplemental counts taken in October of 2015. Appendix A contains the traffic counts and validation counts utilized in this report.

As shown in Table 3-3, the following roadway segments operate at LOS E or F under Existing Conditions:

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to W. Morena Boulevard (*south split*) (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Napa Street, from Morena Boulevard to Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

3.2 Intersection Analysis

A total of twenty-seven (27) study intersections were analyzed as part of the Existing Conditions assessment, whereas the other scenarios included additional intersections that do not exist today. Figure 3-3 displays current intersection geometries, while Figure 3-4 shows existing AM and PM peak period turning movements. The study area intersection traffic counts are provided in Appendix B.

Table 3-2 displays the existing AM and PM peak hour LOS analysis results for the key study area intersections. LOS analyses were conducted using the methodologies described in Chapter 2.0. Intersection LOS calculation worksheets for Existing Conditions are provided in Appendix C. As shown, the following three (3) study intersections currently operate at LOS E or F:

- East Mission Bay Drive & Clairemont Drive (LOS E – PM peak hour)
- Morena Boulevard & Savannah Street (LOS E – PM peak hour)
- Linda Vista Road & Napa Street (LOS E – PM peak hour)

Figure 3-5 depicts the locations of the three intersections operating at LOS E.

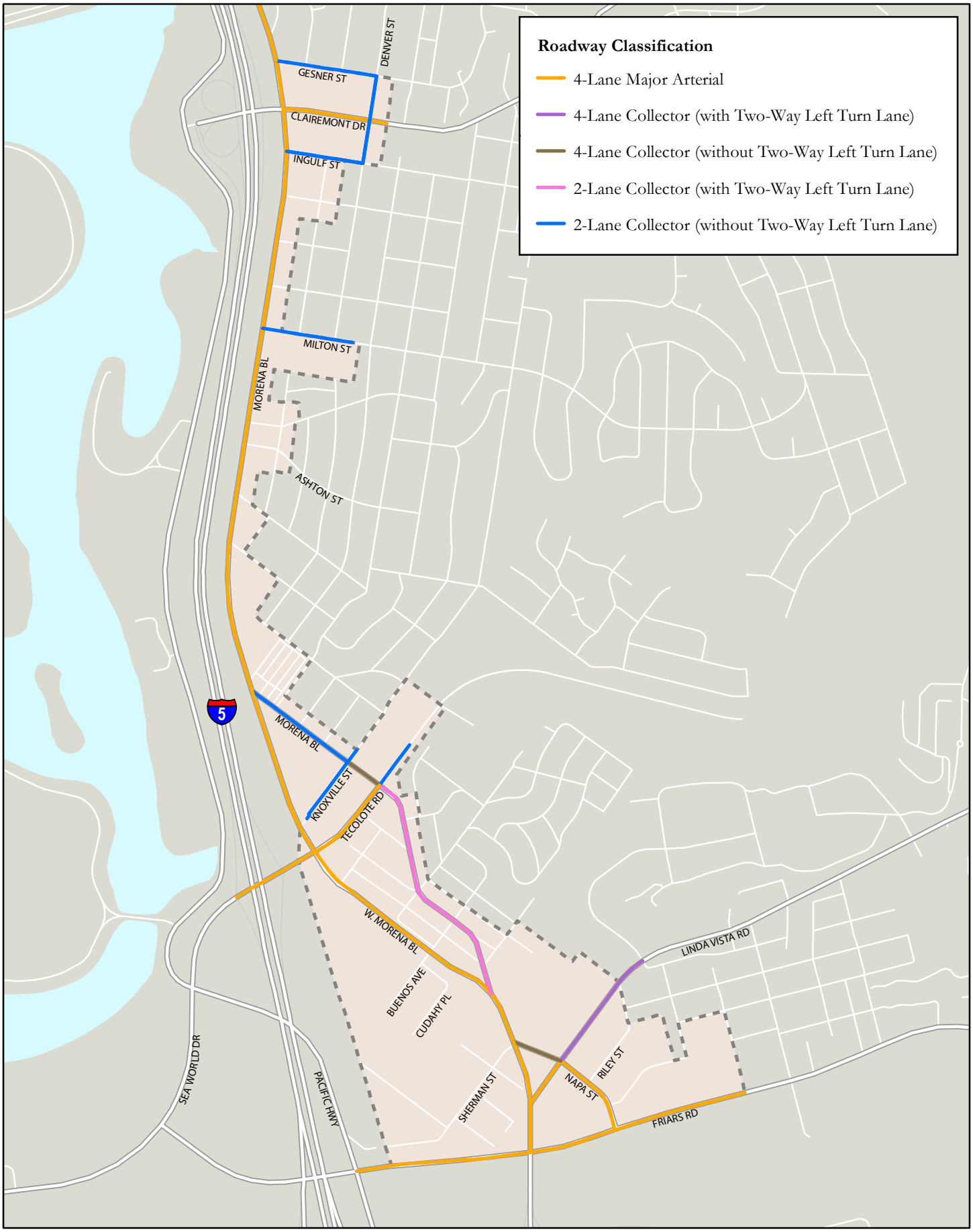


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Figure 3-1
Roadway Classification - Existing Conditions

Table 3-1 Roadway Level of Service – Existing Conditions

Roadway	Segment	Existing Functional Classification	Maximum Capacity at LOS E	ADT[1]	V/C	LOS
Gesner Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	3,556	0.44	C
Clairemont Drive	I-5 NB Ramps to Denver St	4-Lane Major Arterial	40,000	28,929[2]	0.72	C
Ingulf Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	5,185	0.65	D
Denver Street	Clairemont Dr to Ingulf St	2-Lane Collector (w/o TWLTL)	8,000	10,064	1.26	**F**
Morena Boulevard	North of Gesner St	4-Lane Major Arterial	40,000	13,508	0.34	A
	Gesner St to Ingulf St	4-Lane Major Arterial	40,000	11,397	0.28	A
	Ingulf St to Milton St	4-Lane Major Arterial	40,000	14,805	0.37	A
	Milton St to Ashton St[1]	4-Lane Major Arterial	40,000	16,362	0.41	B
	Ashton St to W. Morena Blvd	4-Lane Major Arterial	40,000	15,598	0.39	B
	W. Morena Blvd to Knoxville St	2-Lane Collector (w/o TWLTL)	8,000	9,171	1.15	**F**
	Knoxville St to Tecolote Rd	4-Lane Collector (w/o TWLTL)	15,000	17,469	1.16	**F**
	Tecolote Rd to Buenos Ave	2-Lane Collector (w/ TWLTL)	15,000	16,020	1.07	**F**
	Buenos Ave to W. Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	16,603	1.11	**F**
	W. Morena Blvd to Napa St	4-Lane Major Arterial	40,000	29,808[2]	0.75	C
	Napa St to Linda Vista Rd	4-Lane Major Arterial	40,000	23,023	0.58	C
	South of Linda Vista Rd	4-Lane Major Arterial	40,000	40,067[2]	1.00	**F**
West Morena Boulevard	Morena Blvd to Vega St	4-Lane Major Arterial	40,000	11,129[2]	0.28	A
	Vega St to Buenos Ave	5-Lane Major Arterial	45,000	11,014	0.24	A
	Buenos Ave to Morena Blvd	5-Lane Major Arterial	45,000	13,312	0.30	A
Napa Street	Morena Blvd to Linda Vista Rd	4-Lane Collector (w/o TWLTL)	15,000	24,812	1.65	**F**
	Linda Vista Rd to Riley St	4-Lane Major Arterial	40,000	17,681	0.44	B
	Riley St to Friars Rd	4-Lane Major Arterial	40,000	13,920	0.35	A
Milton Street	East of Morena Blvd	2-Lane Collector (w/o TWLTL)	8,000	3,821	0.48	C
Knoxville Street	Morena Blvd to Savannah St	2-Lane Collector (w/o TWLTL)	8,000	1,149	0.14	A
Tecolote Road	Morena Blvd to I-5 NB Ramps	4-Lane Major Arterial	40,000	24,513	0.61	C
Linda Vista Road	Morena Blvd to Napa St	4-Lane Major Arterial	40,000	22,603	0.57	C
	Napa St to Marian Wy	4-Lane Collector (w/ TWLTL)	30,000	26,868	0.90	**E**
Friars Road	Napa St to Colusa St	4-Lane Major Arterial	40,000	19,550	0.49	B
	West of Napa St	4-Lane Major Arterial	40,000	9,355	0.23	A

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:

[1] ADT volumes reported in the Morena Boulevard Station Area Planning Study drew from five days of counts, utilizing the greatest volume in each direction over the five-day period. ADT count sheets are provided in Appendix A.

[2] Validation count from a single day in October 2015.

Volumes from the Morena Boulevard Station Area Planning Study Final Report were utilized, unless otherwise noted.

Bold letter indicates substandard LOS.

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Transportation Impact Analysis
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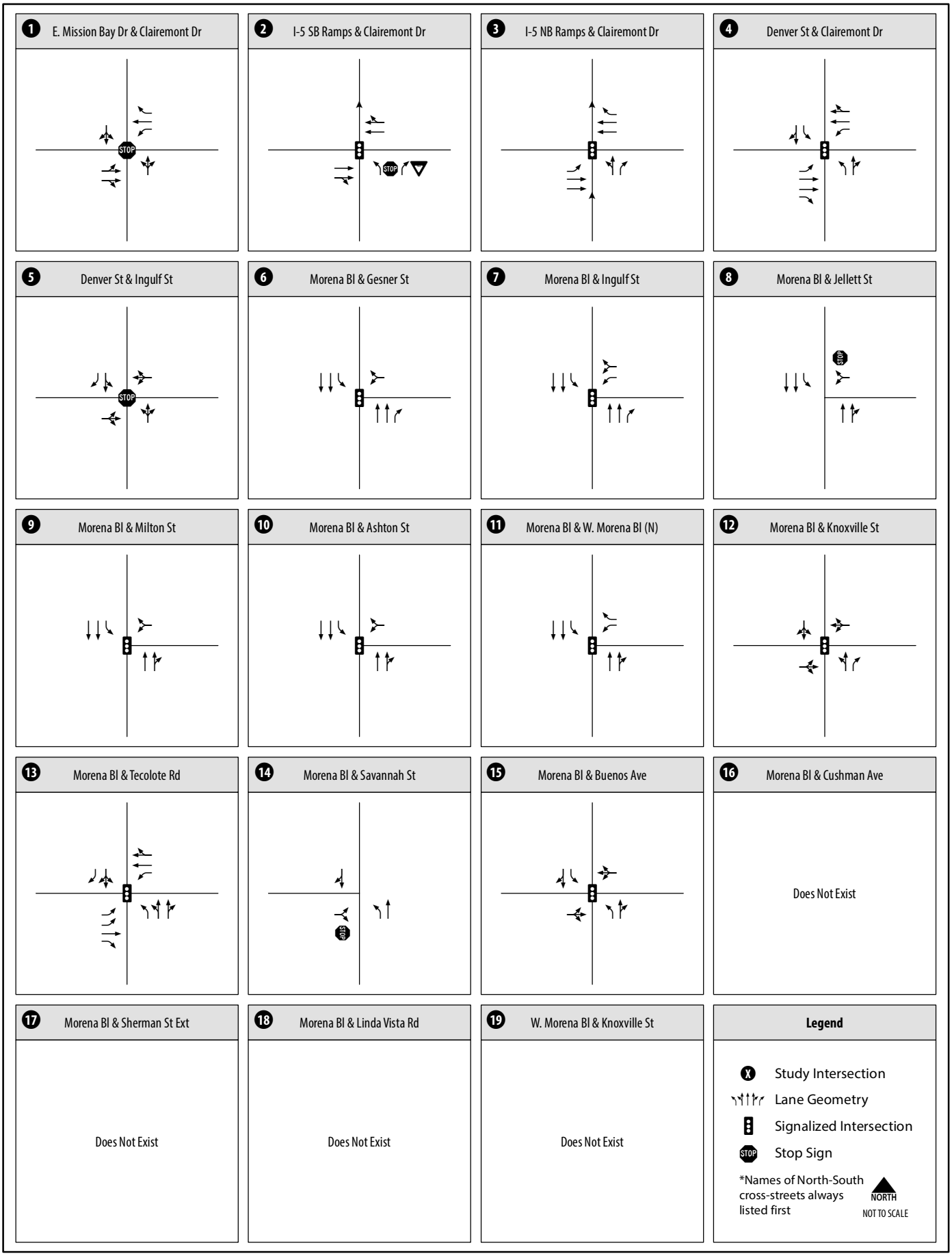
Figure 3-2
Daily Traffic Volumes and Roadway Level of Service - Existing Conditions



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Transportation Impact Analysis
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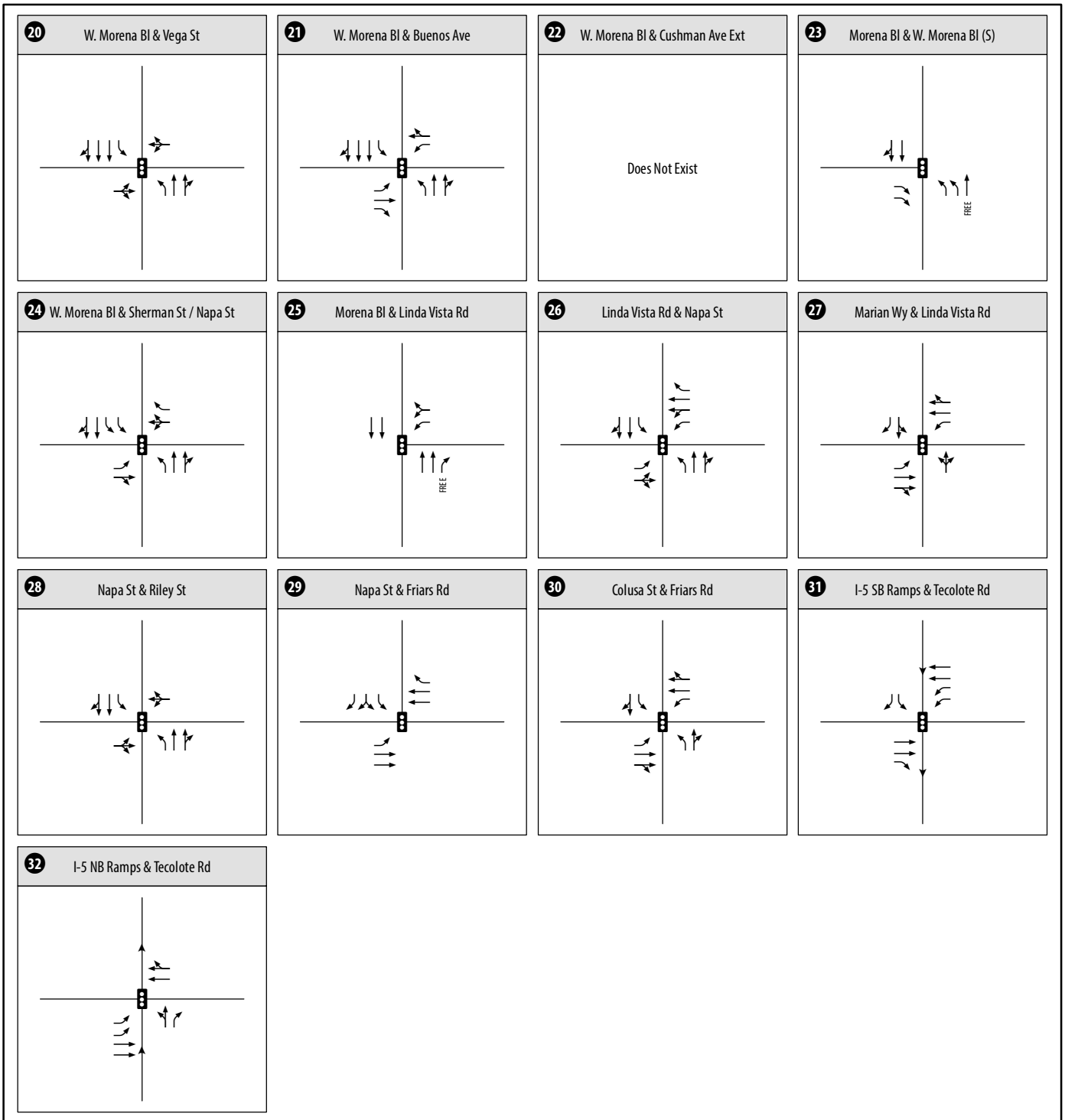
Figure 3-3
Intersection Geometrics - Existing Conditions
(Intersections 1-19)



Morena Corridor Specific Plan
Transportation Impact Analysis
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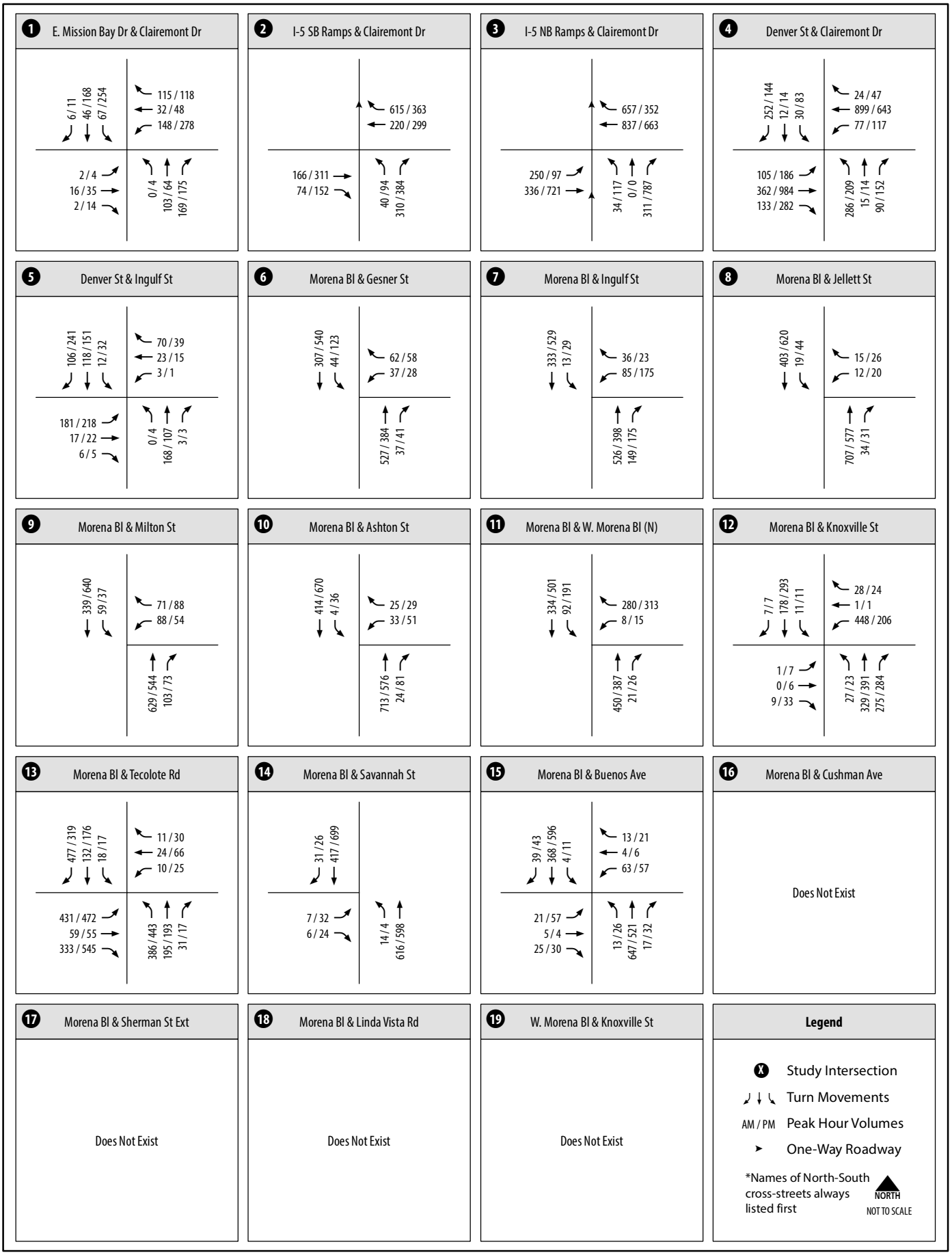
Figure 3-3
Intersection Geometrics - Existing Conditions
(Intersections 20-32)



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Transportation Impact Analysis
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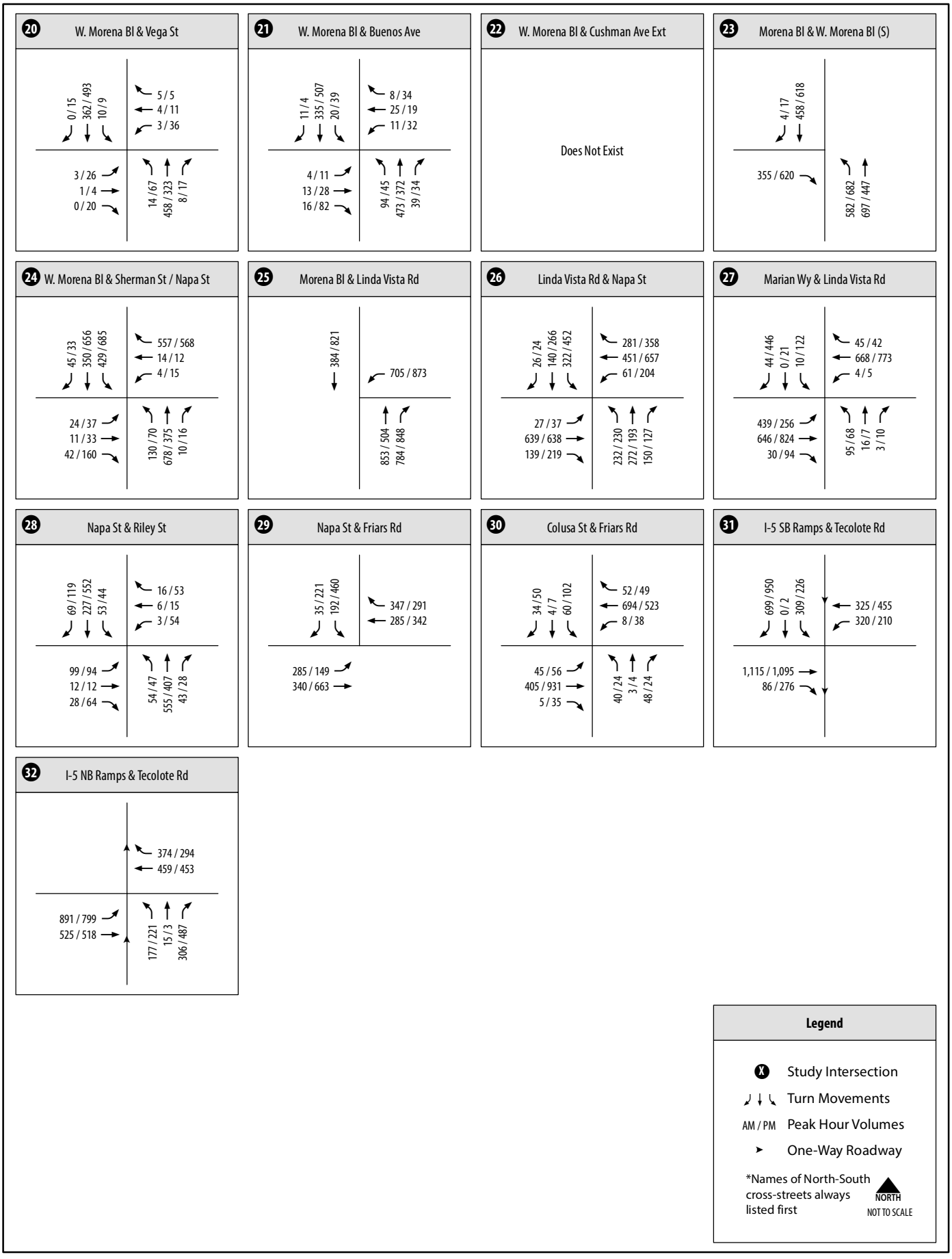
Figure 3-4
Peak Hour Turning Movement Volumes - Existing Conditions
(Intersections 1-19)



Morena Corridor Specific Plan
Transportation Impact Analysis
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Figure 3-4
Peak Hour Turning Movement Volumes - Existing Conditions
(Intersections 20-32)

Table 3-2 Existing AM/PM Peak Hour Level of Service

No.	Intersection	Traffic Control	AM		PM	
			Delay (sec)	LOS	Delay (sec)	LOS
1	E. Mission Bay Dr & Clairemont Dr[1]	AWSC	11.3	B	41.6	**E**
2	I-5 SB Ramps & Clairemont Dr[1]	Signalized	11.7	B	16.8	C
3	I-5 NB Ramps & Clairemont Dr	Signalized	11.5	B	9.7	A
4	Denver St & Clairemont Dr	Signalized	37.6	D	23.9	C
5	Denver St & Ingulf St	AWSC	9.9	A	14.8	B
6	Morena Blvd & Gesner St	Signalized	8.3	A	10.4	B
7	Morena Blvd & Ingulf St	Signalized	7.2	A	9.8	A
8	Morena Blvd & Jellett St	SSSC	15.5	C	18.1	C
9	Morena Blvd & Milton St	Signalized	10.0	B	7.8	A
10	Morena Blvd & Ashton St	Signalized	4.9	A	6.5	A
11	Morena Blvd & W. Morena Blvd (north split)	Signalized	11.2	B	11.4	B
12	Morena Blvd & Knoxville St	Signalized	21.6	C	11.4	B
13	Morena Blvd & Tecolote Rd	Signalized	30.1	C	32.7	C
14	Morena Blvd & Savannah St	SSSC	18.9	C	37.9	**E**
15	Morena Blvd & Buenos Ave	Signalized	14.0	B	13.3	B
16	Morena Blvd & Cushman Ave	*Does not exist*				
17	Morena Blvd & Sherman St Extension	*Does not exist*				
18	Morena Blvd & Linda Vista Rd	*Does not exist*				
19	W. Morena Blvd & Knoxville St	*Does not exist*				
20	W. Morena Blvd & Vega St	Signalized	5.6	A	9.5	A
21	W. Morena Blvd & Buenos Ave	Signalized	12.8	B	13.1	B
22	W. Morena Blvd & Cushman Ave Extension	*Does not exist*				
23	W. Morena Blvd & Morena Blvd (south split)	Signalized	8.7	A	14.7	B
24	W. Morena Blvd & Napa St & Sherman St	Signalized	46.4	D	50.7	D
25	W. Morena Blvd & Linda Vista Rd	Signalized	13.3	B	20.0	B
26	Linda Vista Rd & Napa St	Signalized	51.4	D	77.7	**E**
27	Marian Wy & Linda Vista Rd	Signalized	36.0	D	17.9	B
28	Napa St & Riley St	Signalized	14.5	B	14.4	B
29	Napa St & Friars Rd	Signalized	19.3	B	13.6	B
30	Colusa St & Friars Rd	Signalized	11.2	B	12.0	B
31	I-5 SB Ramps & Tecolote Rd[1]	Signalized	20.2	C	12.9	B
32	I-5 NB Ramps & Tecolote Rd[1]	Signalized	34.6	C	33.3	C

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

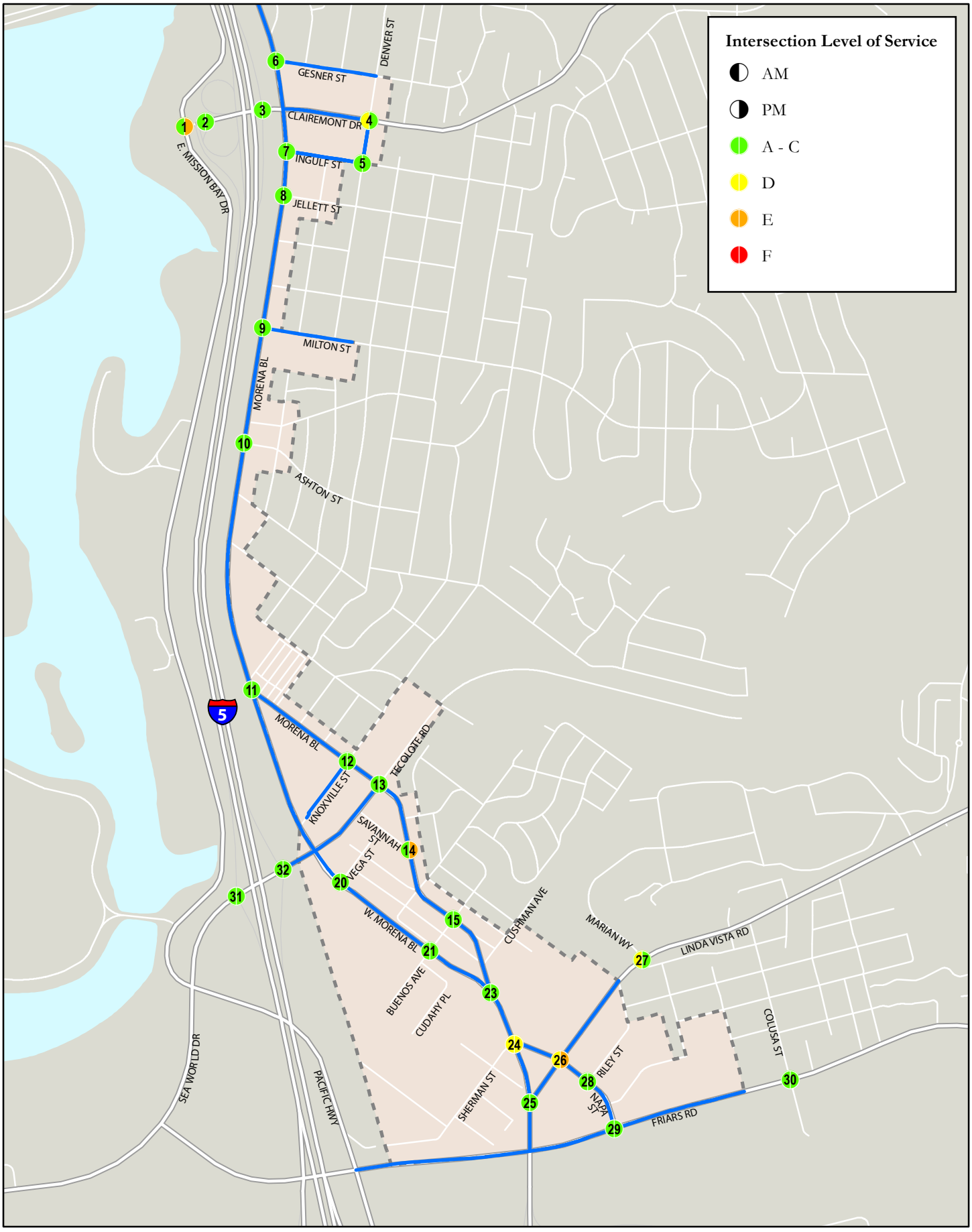
Notes:

[1] Intersection not analyzed in Morena Boulevard Station Area Planning Study Final Report (February 2014).

Bold letter indicates substandard LOS.

AWSC = All-Way Stop-Control.

SSSC = Side Street Stop-Control.



Morena Corridor Specific Plan
Transportation Impact Analysis
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Figure 3-5
Existing Intersection Level of Service

3.3 Freeway Segment Analysis

Interstate 5 (I-5) is a north-south freeway, running adjacent to the western study area boundary. The freeway traverses the United States from the Mexican border to the Canadian border through the states of California, Oregon, and Washington. Within California, I-5 connects the major metropolitan areas of San Diego, Los Angeles, Sacramento and the eastern portion of the San Francisco Bay Area. Within the vicinity of the project study area, I-5 can be accessed via the following roadway interchanges:

- Clairemont Drive (NB & SB)
- Tecolote Road/Sea World Drive (NB & SB)

Interstate 8 (I-8) is an east-west freeway, running adjacent to the southern study area boundary. The freeway extends from the western coast of San Diego to central Arizona. Within the vicinity of the project study area, access to I-8 is provided via the following roadway interchanges:

- Morena Boulevard (EB & WB)

Table 3-3a and Table 3-3b display freeway segment LOS analysis results for freeway segments in the vicinity of the study area. Caltrans freeway volumes and HCS worksheets are provided in Appendix D.

As shown, all key freeway segments are currently operating at LOS D or better with the exception of the following:

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS E)

Table 3-3a Existing AM Freeway Segment Level of Service Results

Freeway	Segment	ADT	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	Peak Hr Volume	Speed	Density	LOS
I-5	Grand Ave/Garnet Ave to Clairemont Dr	162,000	NB	4M+1A	57%	7%	4%	6,464	66.7	26.0	D
			SB	4M+1A	43%	7%	4%	4,876	69.9	18.7	C
	Clairemont Dr to Sea World Dr/Tecolote Rd	221,000	NB	5M	57%	7%	3%	8,818	64.6	29.2	D
			SB	5M	43%	7%	3%	6,652	69.4	20.5	C
	Sea World Dr /Tecolote Rd to I-8	205,000	NB	4M+2A	57%	7%	3%	8,179	58.7	37.2	**E**
			SB	4M+2A	43%	7%	3%	6,170	64.1	25.7	C
	I-8 to Old Town Ave	203,000	NB	4M+1A	54%	8%	5%	8,770	51.8	45.7	**F**
			SB	5M	46%	8%	5%	7,470	64.4	25.0	C
I-8	Sports Arena Blvd to I-5	102,000	EB	3M+1A	61%	8%	1%	4,978	66.4	26.4	D
			WB	3M+1A	39%	8%	1%	3,182	70.0	16.0	B
	I-5 to Morena Blvd	131,000	EB	4M+1A	44%	7%	1%	4,035	70.0	15.2	B
			WB	5M	56%	7%	1%	5,135	65.0	16.7	B
	Morena Blvd to Hotel Circle	187,000	EB	4M+1A	44%	7%	3%	5,760	64.7	23.8	C
			WB	5M	56%	7%	3%	7,330	64.6	24.2	C

Source: Caltrans (2015); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor

Table 3-3b Existing PM Freeway Segment Level of Service Results

Freeway	Segment	ADT	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	Peak Hr Volume	Speed	Density	LOS
I-5	Grand Ave/Garnet Ave to Clairemont Dr	162,000	NB	4M+1A	46%	8%	4%	5,962	68.1	23.5	C
			SB	4M+1A	54%	8%	4%	6,998	64.7	29.0	D
	Clairemont Dr to Sea World Dr/Tecolote Rd	221,000	NB	5M	46%	8%	3%	8,133	66.6	26.1	D
			SB	5M	54%	8%	3%	9,547	61.8	33.0	D
	Sea World Dr /Tecolote Rd to I-8	205,000	NB	4M+2A	46%	8%	3%	7,544	62.3	32.3	D
			SB	4M+2A	54%	8%	3%	8,856	51.8	45.7	**F**
	I-8 to Old Town Ave	203,000	NB	4M+1A	40%	7%	5%	5,684	64.7	23.7	C
			SB	5M	60%	7%	5%	8,526	62.3	29.6	D
I-8	Sports Arena Blvd to I-5	102,000	EB	3M+1A	36%	7%	1%	2,570	70.0	12.9	B
			WB	3M+1A	64%	7%	1%	4,570	68.0	23.7	C
	I-5 to Morena Blvd	131,000	EB	4M+1A	56%	8%	1%	5,869	68.6	22.6	C
			WB	5M	44%	8%	1%	4,611	65.0	15.0	B
	Morena Blvd to Hotel Circle	187,000	EB	4M+1A	55%	8%	3%	8,228	56.0	39.3	**E**
			WB	5M	45%	8%	3%	6,732	65.0	22.1	C

Source: Caltrans (2015); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor

3.4 Ramp Metering Analysis

Table 3-4 displays the ramp metering analysis results for on-ramp meter locations within the study area.

Table 3-4 Ramp Metering Analysis – Existing Conditions

Ramp	Peak	Lanes		Peak Hr Demand[1] (veh/hr) per lane	Meter Rate[2] (veh/hr) per lane	Excess Demand[3] (veh/hr) per lane	Delay[4] (min)	Queue[5] (ft)
		SOV	HOV					
I-5 SB / Eastbound Clairemont Dr	AM	1	0	74	318	0	0	0
	PM	1	0	152	318	0	0	0
I-5 SB / Westbound Clairemont Dr	AM	1	1	327	492	0	0	0
	PM	1	1	554	492	62	7.56	1798
I-5 NB / Clairemont Drive	AM	1	1	816	677	139	12.32	4031
	PM	1	1	404	492	0	0	0
I-5 SB / Sea World Dr / Tecolote Rd	AM	1	1	365	366	0	0	0
	PM	1	1	439	350	89	15.26	2581
I-5 NB / Sea World Dr / Tecolote Rd	AM	2	0	640	965	0	0	0
	PM	2	0	548	972	0	0	0

Source: Caltrans (2016); Chen Ryan Associates (2017)

Notes:
SOV = Single Occupancy Vehicle
HOV = High Occupancy Vehicle
[1] Demand is the peak hour demand expected to use the on-ramp, derived from peak hour turning movement volumes
[2] Meter Rate is the peak hour capacity expected to be processed through the ramp meter. This value was obtained from Caltrans and reflects the most restrictive meter rates unless otherwise noted.
[3] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater
[4] Delay = (Excess Demand / Meter Rate) X 60 min/hr
[5] Queue = (Excess Demand) X 29 ft/veh

As shown, the peak hour capacity anticipated to be processed through the ramp meters exceeds the meter rate and results in a delay greater than 15-minutes at the I-5 SB / Sea World Drive / Tecolote Road ramp during the PM peak hour.

3.5 Pedestrian Facilities

Existing sidewalks are found along the following study roadway segments:

- Gesner Street, from Morena Boulevard to Denver Street – Sidewalks are present along both sides of this segment.
- Clairemont Drive, from I-5 NB ramps to Denver Street – Sidewalks are present along both sides of this segment.
- Ingulf Street, from Morena Boulevard to Denver Street – Sidewalks are present along both sides of this segment.
- Denver Street, from Clairemont Drive to Ingulf Street – Sidewalks are present along both sides of this segment.

- Morena Boulevard, from Gesner Street to Ingulf Street – A sidewalk is present along the east side of this segment.
- Morena Boulevard, from Ingulf Street to Milton Street – Sidewalks are present along both sides of this segment.
- Morena Boulevard, from Milton Street to Ashton Street - A sidewalk is present along the east side of this segment.
- Morena Boulevard, from Ashton Street to West Morena Boulevard – Sidewalks are present along both sides of this segment.
- Morena Boulevard, from West Morena Boulevard to Knoxville Street – Sidewalks are present along the north side and intermittent along the south side along this segment.
- Morena Boulevard, from Knoxville Street to Buenos Avenue – Sidewalks are present along both sides of this segment.
- Morena Boulevard, from Buenos Avenue to West Morena Boulevard – Sidewalks are intermittent along both sides of this segment.
- Morena Boulevard, from West Morena Boulevard to Linda Vista Road - Sidewalks are present along both sides of this segment.
- Morena Boulevard, south of Linda Vista Road – A sidewalk is continuously present along the east side of Morena Boulevard. Along the west side, a sidewalk begins at the southern limit of the study area.
- West Morena Boulevard, from Morena Boulevard to Vega Street – An intermittent sidewalk is present along the east side of West Morena Boulevard. Along the west side, a sidewalk is briefly present for approximately 200’ at the north end of the segment and approximately 140’ at the south end of the segment.
- West Morena Boulevard, from Vega Street to Morena Boulevard – A sidewalk is present on the south side of West Morena Boulevard. A sidewalk is present on the north side from Vega Street until the frontage road (Dorcas Street). The sidewalk continues along Dorcas Street/Naples Place until the end of the frontage road.
- Napa Street, from Morena Boulevard to Friars Road - Sidewalks are present along both sides of this segment.
- Milton Street, east of Morena Boulevard – Sidewalks are present along both sides of this segment.
- Knoxville Street, from Morena Boulevard to Savannah Street – Sidewalks are present along both sides of this segment.
- Sea World Drive/Tecolote Road, from I-5 Northbound Ramps to Morena Boulevard – Sidewalks are present along both sides of this segment.
- Buenos Avenue, south of Cudahy Place – Sidewalks are present along both sides of this segment.
- Cudahy Place, east of Buenos Avenue – Sidewalks are intermittent along both sides of this segment.

- Sherman Street, from Morena Boulevard to Grant Street – Sidewalks are intermittent along both sides of this segment.
- Linda Vista Road, from Morena Boulevard to Marian Way – Sidewalks are present along both sides of this segment.
- Riley Street, from Napa Street to Lauretta Street – Sidewalks are almost nonexistent along both sides of this segment.
- Friars Road, west of Napa Street to Colusa Street – Sidewalks are present along both sides of this segment.

3.6 Bicycle Facilities

Within the study area, the following bicycle facilities are present:

- A southbound Class II bike lane runs along the west side of Morena Boulevard extending from the northern study area boundary to the northern Morena Boulevard/West Morena Boulevards split. The bike lane continues southbound along the west side of West Morena Boulevard until approximately 180' north of Vega Street.
- Class II bike lanes run in both directions along Morena Boulevard from Tecolote Road to the southern study area boundary.
- Napa Street is designated as a Class III bike route from Linda Vista Road to Friars Road; however, no vertical signage or pavement markings were identified.
- Class II bike lanes are present in both directions along Linda Vista Road from Napa Street in the south, extending outside of the study area.
- Class II bike lanes are present in both directions along Tecolote Road, from the I-5 northbound ramps to Morena Boulevard where the bike lane continues only in the eastbound direction.
- A two-way cycle track runs along the south side of Friars Road, from Sea World Drive and extending east outside of the study area.

Multiple adopted planning documents identify different recommended bicycle facilities within the study area, including the Linda Vista Community Plan, Clairemont Mesa Community Plan, City of San Diego Bicycle Master Plan, and SANDAG's Riding to 2050: San Diego Regional Bike Plan. A description of the bicycle facility recommendations from each of these documents is provided in the paragraphs below.

The Linda Vista Community Plan proposed unclassified bicycle facilities along Morena Boulevard west of Tecolote Road, Morena Boulevard south of West Morena Boulevard, and along Napa Street.

The Clairemont Mesa Community Plan recommends a Class III bike route along Morena Boulevard within the Clairemont Community, Class III bike route along Clairemont Drive east of Morena Boulevard, and Class II bike lanes along Tecolote Road from Interstate 5 to Morena Boulevard.

The City of San Diego Bicycle Master Plan recommends a Class I multi-use path adjacent to the rail corridor. Class II bike lanes are recommended along Morena Boulevard/West Morena Boulevard from Gesner Street to the Morena Boulevard terminus at Taylor Street in Old Town. A Class III bicycle route is proposed on Morena Boulevard from West Morena Boulevard to Knoxville Street, which then continues

as a Class II bike lane for a block to Tecolote Road. A Class III bicycle route is recommended along Knoxville Street. Class II bike lanes are recommended along Napa Street.

SANDAG's Riding to 2050: San Diego Regional Bike Plan also proposes a Class I multi-use path adjacent to the rail corridor. The Regional Bike Plan also recommends Class II bike lanes along Clairemont Drive from the western terminus to Burgener Boulevard.

3.7 Transit

Existing transit service within the study area consists of the Green Line Trolley and local bus routes 44, 50, and 105. A description of each route is provided below.

The *Green Line Trolley* has one stop in the study area, the Morena/Linda Vista Station, located southeast of the Morena Boulevard/Linda Vista Road intersection. The Green Line currently extends from the 12th and Imperial Transit Center in Downtown San Diego to the Santee Town Center Station in the City of Santee. The Green Line provides 15-minute service Mondays through Saturdays, and 30-minute service during the late-evenings, Saturday mornings, and Sundays.

Bus Route 44 provides service between the Old Town Transit Center and Clairemont Square (Clairemont Drive and Clairemont Drive). Route 44 runs along Taylor Street, Morena Boulevard, Linda Vista Road, Mesa College Drive, Stalmer Street, Kearny Mesa Road, Convoy Street and Clairemont Mesa Boulevard. Service runs from 4:22 AM to 12:06 AM during weekdays, between 5:52 AM and 11:49 PM on Saturdays, and between 6:30 AM and 10:06 PM on Sundays.

Bus Route 50 provides service between Downtown San Diego and the UTC Transit Center. Route 50 runs along 9th Avenue, 10th Avenue, Broadway, Front Street, 1st Street, Interstate 5, Clairemont Drive, Clairemont Mesa Boulevard, and Genesee Avenue. Service runs from 4:56 AM to 7:18 PM during weekdays. Route 50 does not provide evening or weekend service.

Bus Route 105 provides service between the Old Town Transit Center and UTC Transit Center. Route 105 runs along Traylor Street, Morena Boulevard, Milton Street, Burgener Boulevard, Clairemont Drive, Clairemont Mesa Boulevard, Regents Road, Governor Drive, and Genesee Avenue. Service runs from 5:10 AM to 10:32 PM during weekdays, between 6:13 AM to 8:50 PM on Saturdays, and between 6:58 AM and 8:50 PM on Sundays.

Implementation of the Morena Corridor Specific Plan will require a slight modification of Bus Route 105 to accommodate the reconfigured roadway network. Route 105 follows Morena Boulevard from Milton Street, extending south to the Old Town Transit Center outside of the study area. The Morena Boulevard segment between Buenos Avenue and West Morena Boulevard will be vacated to provide for the extension of Morena Boulevard to Linda Vista Road.

4.0 Preferred Plan Mobility Network

This section documents the recommended mobility improvements for the Morena Corridor Specific Plan. The mobility network is identical for all scenarios analyzed, with the only variations being the land use designations.

The Preferred Plan mobility network was developed in the Morena Boulevard Station Area Planning Study Final Report (2014) and serves to address the identified existing mobility related issues and needs. Additional modifications were made to the network in response to changes to the land use scenarios and community input received over the course of the project.

4.1 Roadway and Intersection Improvements

A list of Preferred Plan roadway improvements, including modifications to segments and intersections, and new roadways and intersections are presented throughout this section. Analysis of the Preferred Plan mobility network is provided in the following chapters for the Preferred Plan (High-Density Alternative) land uses, the Mid-Density Alternative land use plan and qualitatively for the Low-Density Alternative.

Roadways

The majority of roadways within the study area will remain unchanged from existing conditions; however, the Preferred Plan includes roadway improvements and new roadway segments intended to accommodate anticipated future traffic demands and improve overall operations. Table 4-1 identifies the proposed roadway segment modifications, including new roadways, in the study area.

Table 4-1 Summary of Roadway Improvements

Roadway	Segment	Existing Configuration	Recommended Classification
Segment Modifications			
Morena Blvd	North of Gesner St to W. Morena Blvd	4-Lane Major Arterial	3-Lane Collector (w/ TWLTL)[1]
West Morena Blvd	Morena Blvd to Vega St	4-Lane Major Arterial	3-Lane Collector (w/ TWLTL)[1]
West Morena Blvd	Vega Street to Linda Vista Road	5-Lane Major Arterial	4-Lane Major Arterial
Napa St	Morena Blvd to Linda Vista Rd	4-Lane Collector (w/o TWLTL)	Closed to Vehicular Traffic
Morena Blvd	Morena Place to West Morena Blvd	2-Lane Collector (w/ TWLTL)	Remove Segment
New Roadways			
Morena Blvd Extension	Buenos Ave to Linda Vista Rd	Does Not Exist	2-Lane Collector (w/ TWLTL)
Cushman Ave Extension	Morena Blvd to West Morena Blvd	Does Not Exist	2-Lane Collector (w/ TWLTL)
Sherman St Extension	Morena Blvd to West Morena Blvd	Does Not Exist	2-Lane Collector (w/ TWLTL)
Knoxville St Extension	Knoxville St southern terminus to W. Morena Blvd	Does Not Exist	2-Lane Collector (w/o TWLTL)

Source: Chen Ryan Associates (2017)

Note:
[1] 3-Lane Collector (w/ TWLTL) classification consists of 2-lanes northbound, 1-lane southbound, and a two-way left-turn lane.

Intersections

The Preferred Plan mobility network consists of the following intersection improvements:

Morena Boulevard / Gesner Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).

Morena Boulevard / Ingulf Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).

Morena Boulevard / Jellett Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).

Morena Boulevard / Milton Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).

Morena Boulevard / Ashton Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).

Morena Boulevard / Asher Street

- Permit left-turns from southbound Morena Boulevard onto eastbound Asher Street.

Morena Boulevard / W. Morena Boulevard (north split)

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (Morena Boulevard).
- Square up the east leg approach from Morena Boulevard by extending the curb/sidewalk area along the north side of Morena Boulevard and reducing the curb/sidewalk area on the south side of Morena Boulevard.
- Further analyze operations at this intersection to determine if a roundabout would be beneficial.

West Morena Boulevard / Knoxville Street

- Establish this new intersection as side-street stop controlled (Knoxville Street).

West Morena Boulevard / Vega Street

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (West Morena Boulevard).
- Apply a 3 second lead bicycle/pedestrian interval to accommodate the cycle track along the west side of West Morena Boulevard and anticipated increase in pedestrians.

West Morena Boulevard / Buenos Avenue

- Remove one southbound through lane approach to accommodate the removal of one southbound lane (West Morena Boulevard).

- Apply a 3 second lead bicycle/pedestrian interval to accommodate the cycle track along the west side of West Morena Boulevard and anticipated increase in pedestrians.

West Morena Boulevard / Cushman Avenue Extension

- Establish this new fully signalized intersection.

West Morena Boulevard / Napa Street / Sherman Street

- Remove access to and from Napa Street. Napa Street, between Morena Boulevard and Linda Vista Road, will be closed to vehicular traffic.
- Add the Sherman Street extension, extending Sherman Street north through the intersection to connect to the Morena Boulevard extension.
- Apply a 3 second lead bicycle/pedestrian interval to accommodate the cycle track along the west side of West Morena Boulevard and anticipated increase in pedestrians.

West Morena Boulevard / Morena Boulevard (south split)

- This intersection will be removed with the removal of the Morena Boulevard segment between Cushman Avenue and W. Morena Boulevard.

West Morena Boulevard / Linda Vista Road

- Reconfigure the intersection approaches and medians to create more of a standard intersection.
- Fully signalize the intersection, including the shopping center driveway to maintain right-turn movements when exiting the driveway.
- Include dual left-turn only lanes from northbound Linda Vista Road onto westbound West Morena Boulevard.
- Include one left-turn only lane from eastbound West Morena Boulevard onto northbound Linda Vista Road.
- Include one right-turn only lane from eastbound West Morena Boulevard onto southbound Linda Vista Road.
- Include one shared through-right turn lane from eastbound West Morena Boulevard into the shopping center/onto southbound Linda Vista Road to improve access to the Morena/Linda Vista Trolley Station.
- Apply a 10 second bicycle/pedestrian phase to accommodate the cycle track along the west side of West Morena Boulevard and anticipated increase in pedestrians.

Morena Boulevard Extension / Linda Vista Road

- Construct this new signalized intersection to accommodate the extension of Morena Boulevard (2-Lane Collector with Two-Way Left-Turn Lane) from Cushman Avenue to Linda Vista Road.
- Include a dedicated left-turn lane with protected phasing from northbound Linda Vista Road onto the westbound Morena Boulevard.

Napa Street / Linda Vista Road

- Remove the northbound dedicated right-turn only lane from the Napa Street leg of the intersection to provide for the installation of Class II bike lanes along Napa Street. Implementation of the Class II bike lanes may also require relocating the rail gate and beacon approximately 6' west of the current position.

Five (5) new intersections are recommended within the study area. Additionally, the roadway network was evaluated to identify intersection locations, both existing and new intersections, that would benefit from signalization. A summary of recommended intersection control modifications are displayed in Table 4-2. Traffic signal warrants were conducted at the intersections where signalization is recommended. Figure 4C-103 (CA) of the California Manual on Uniform Traffic Control Devices (MUTCD) 2012 Edition was utilized for the signal warrant. All intersections where signalization is recommended met the warrants. Signal warrant worksheets are provided in Appendix E.

Table 4-2 Summary of Intersection Control Improvements

No.	Intersection	Improvement	Preferred Plan Control
--	Morena Blvd / Napier St	Further analyze roundabout feasibility	Signalized/Roundabout
11	W. Morena Blvd / Morena Blvd *(north split)*	Further analyze roundabout feasibility	Signalized/Roundabout
16	Morena Blvd / Cushman Ave	Further analyze roundabout feasibility	Signalized/Roundabout
17	Morena Blvd / Sherman St Extension	Further analyze roundabout feasibility	Signalized/Roundabout
18	Morena Blvd / Linda Vista Rd	New intersection	Signalized
19	W. Morena Blvd / Knoxville St	New intersection	Side Street Stop Controlled (SSSC)
20	W. Morena Blvd / Vega St	Apply a 3-second lead bicycle/pedestrian phase to the existing signal to accommodate the cycle track along the west side of W. Morena Blvd and anticipated increase in pedestrians.	Signalized
21	W. Morena Blvd / Buenos Avenue	Apply a 3-second lead bicycle/pedestrian phase to the existing signal to accommodate the cycle track along the west side of W. Morena Blvd and anticipated increase in pedestrians.	Signalized
22	W. Morena Blvd / Cushman Ave Extension	New intersection will replace W. Morena Blvd / Morena Blvd *(south split)*. Apply a 3-second lead bicycle/pedestrian phase to the existing signal to accommodate the cycle track along the west side of W. Morena Blvd and anticipated increase in pedestrians.	Signalized
23	W. Morena Blvd / Morena Blvd *(south split)*	Remove intersection	NA
25	W. Morena Blvd & Linda Vista Rd	Reconfigure intersection to square up West Morena Blvd approach with Linda Vista Road and the shopping center driveway. Apply a 10-second lead bicycle/pedestrian phase to the existing signal to accommodate the cycle track along the west side of W. Morena Blvd and anticipated increase in pedestrians.	Signalized

Source: Chen Ryan Associates (2017)

4.2 Pedestrian

In addition to the signal modifications described in Table 4-2, the following enhancements will benefit pedestrian mobility throughout the study area:

- Consistent with the City's updated marked crosswalk policy, include continental crosswalks at all signalized intersection legs where pedestrians are permitted to cross.

- New intersections, and intersection modifications, should be configured to minimize the pedestrian crossing distance through the provision of curb bulb-outs, where feasible. Figure 4-1 provides a concept of the new Cushman Avenue / Morena Boulevard intersection depicting how curb bulb-outs can be implemented to shorten the pedestrian crossing distance across Morena Boulevard.
- Countdown signal heads, pedestrian scale lighting and landscape buffers should be included in future roadway designs, where feasible.

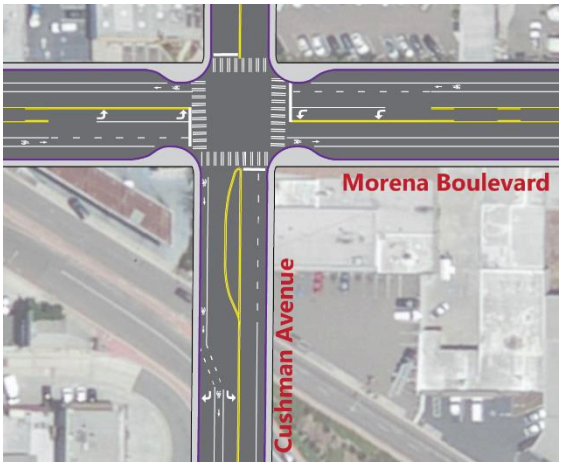

Figure 4-1 *Curb Bulb-Out Concept*

- Continuous sidewalks are recommended to be implemented throughout the study area, with an emphasis on the roadways of Morena Boulevard and West Morena Boulevard where intermittent sidewalks are currently present, and all new roadways.
- Reconfigure the Morena Boulevard/West Morena Boulevard *(north split)* by squaring up the east leg of the intersection (Morena Boulevard) to shorten the pedestrian crossing distance and improve visibility. A conceptual graphic of this improvement is provided as Figure 4-2.
- Reconfigure the Linda Vista Road and W. Morena Boulevard intersection as a standard "T" intersection. A conceptual graphic of this improvement is provided as Figure 4-3.
- Provide a Class I multi-use path connection from the intersection of Morena Boulevard and Sherman Street to the USD parking lot to the north.
- Establish a mid-block pedestrian connection across West Morena Boulevard, between Vega Street and Buenos Avenue, with a continental crosswalk and pedestrian hybrid beacon. The warrant meeting the City's marked crosswalk criteria at uncontrolled locations under buildout conditions is provided in Appendix F.

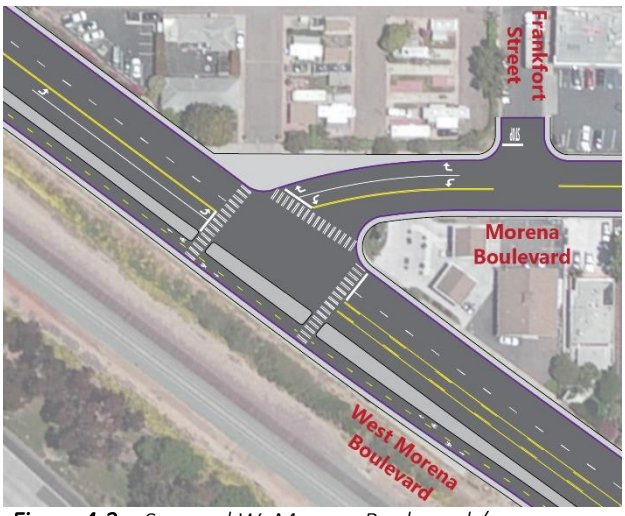

Figure 4-2 *Squared W. Morena Boulevard / Morena Boulevard Intersection Concept*

Figure 4-3 *Reconfigured W. Morena Boulevard / Linda Vista Road Intersection Concept*

4.3 Bicycle

In addition to the signal modifications described in Table 4-2, the following enhancements will benefit bicycle mobility throughout the study area:

- Provide a two-way cycle track along the west side of Morena Boulevard/West Morena Boulevard from Gesner Street in the north to the reconfigured Linda Vista Road and West Morena Boulevard intersection to the south. A conceptual graphic of this improvement can be seen in Figure 4-2.
- Provide Class II bike lanes along the Morena Boulevard extension, from Buenos Avenue to Linda Vista Road. A conceptual graphic of this improvement can be seen in Figure 4-1.
- Provide Class II bike lanes along the Cushman Avenue extension. Figure 4-1 displays a conceptual depiction of this improvement.
- Provide Class II bike lanes along Napa Street, from Linda Vista Road to Friars Road. Figure 4-4 displays a conceptual depiction of this improvement.
- Designate Knoxville Street, between West Morena Boulevard and Morena Boulevard as a Class III bicycle route, identifiable by signage and pavement markings.
- Designate the Sherman Street extension as a Class III bicycle route, identifiable by signage and pavement markings.
- Provide a Class I multi-use path connection from the intersection of Morena Boulevard and Sherman Street to the USD parking lot to the north.

Figure 4-5 displays the proposed bicycle facilities.

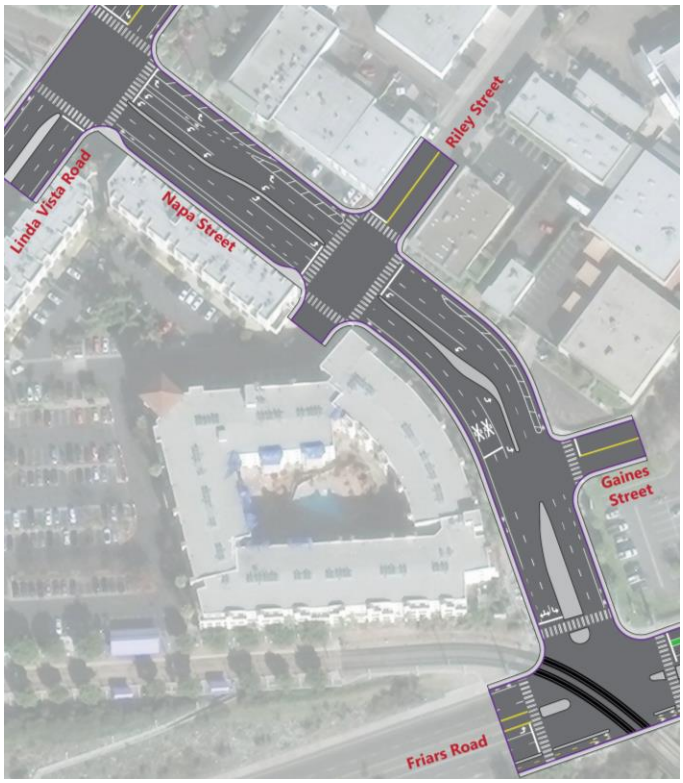

Figure 4-4 *Napa Street Bike Lanes*

Morena Boulevard Station Area Plan

Figure 4-5
Proposed Bicycle Facilities

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4.4 Transit

The Morena Corridor Specific Plan is largely intended to capitalize on the Mid-Coast Trolley extension, which is under construction at the time of this report's preparation. The Mid-Coast Trolley will extend trolley service north from the Old Town Transit Center up to UCSD and UTC, closely following the alignment of Interstate 5. Two stations will be provided within the project study area, including one at West Morena Boulevard and Tecolote Road and another at Morena Boulevard and Clairemont Drive.

Figure 4-6 displays the planned Mid-Coast Trolley alignment and station locations, as provided by SANDAG.

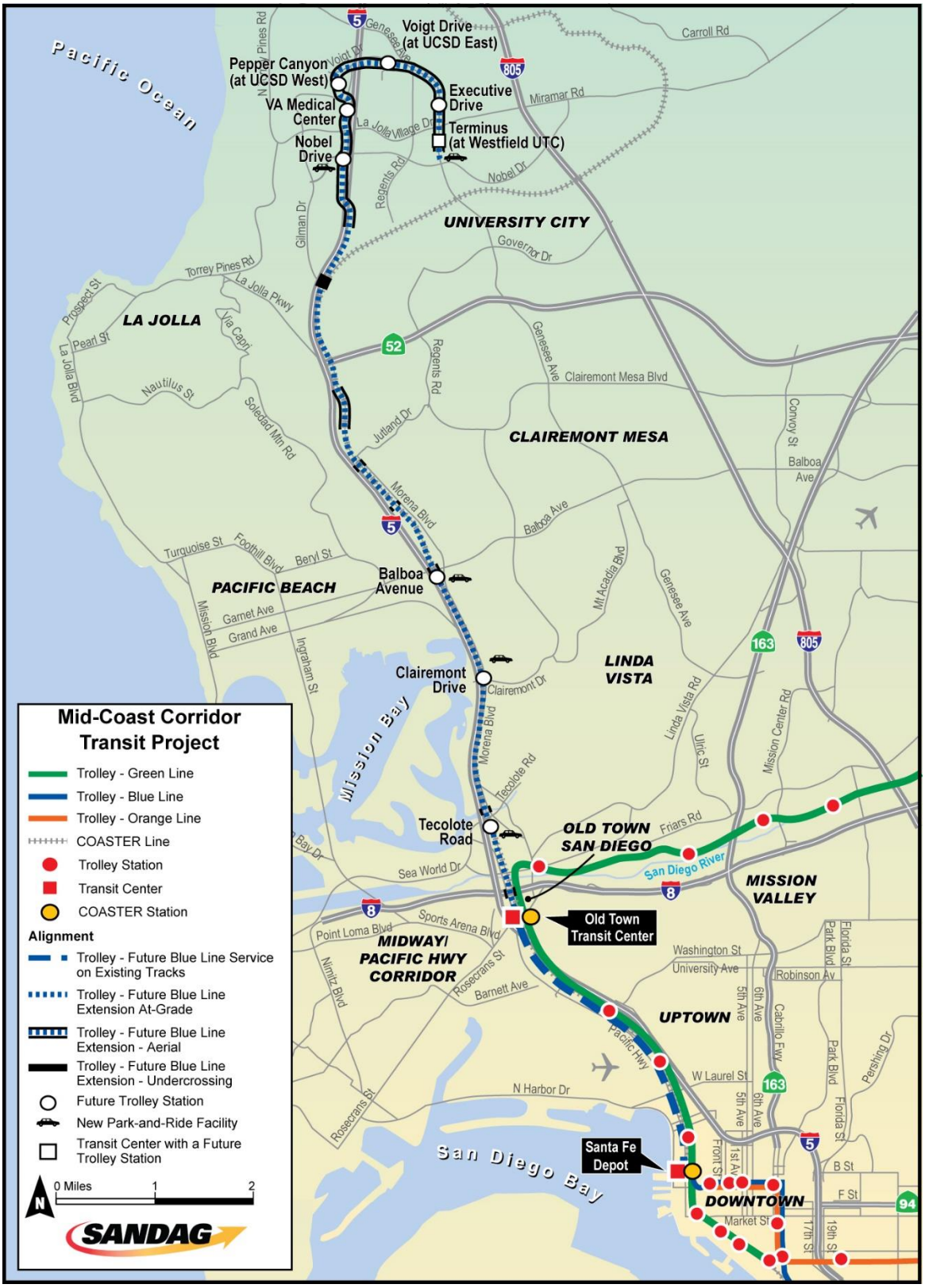
The pedestrian, bicycle and vehicular improvements previously identified in this chapter will benefit transit users as well, by providing improved access to the future stations. Incorporating bicycle facilities into transit stop design is an additional measure that can be taken to strengthen connections to transit, while also maintaining the integrity of bicycle facilities.

For example, wrapping the cycle track or bike lanes around the station may help avoid potential conflicts between cyclists and buses. The image to the right depicts a bus stop with the wrap around design, enabling cyclists to continue riding within a dedicated space while the bus stops to pickup/drop-off passengers.

The bicycle lane was incorporated into the bus stop station design, allowing cyclists to safely pass the idling bus. Photo credit: City of Seattle.

The bicycle facility in the example image is at-grade with the roadway, requiring pedestrians to step down to the street level to go between the sidewalk and the bus stop. This design may help improve pedestrian awareness of the bicycle facility and approaching cyclists, as opposed to designs where the bicycle facility is brought at-grade with the sidewalk. Additional considerations must be made to ensure pedestrians have adequate visibility of approaching cyclists, and that the bus stop remains ADA compliant, particularly in instances where the bicycle facility is level with the roadway.

Figure 4-6 Mid-Coast Trolley Alignment



Source: SANDAG (2017)

5.0 Preferred Plan Analysis

This chapter assesses the potential traffic impacts of the High-Density Alternative (Preferred Plan) by comparing the Preferred Plan to Existing Conditions. All transportation infrastructure improvements described in Chapter 4 are assumed under this analysis. Evaluations are provided for roadway segment and intersection peak hour operations, and freeway segment and ramp meter operations.

The Preferred Plan forecast traffic volumes were developed utilizing the SANDAG Series 12 Preferred Plan Future Year 2035 model. Final SANDAG Series 12 Forecast Model Results for Year 2035 are provided in Appendix G. A memo documenting the calibration process, Base Year model adjustments, and rationale for using the adjusted model volumes are also included within Appendix G.

Table 5-1 presents a comparison of the Preferred Plan and Base Year land use quantities and resulting trip generation for TAZs within the study area.

Table 5-1 Trip Generation – Preferred Plan

Land Use	Total Trips – Preferred Plan	Total Trips – Base Year	Change in Trips
Active Park	37	37	0
Auto Commercial	0	2,181	-2,181
Auto Parts Sale	0	1,768	-1,768
Auto Repair Shop	298	1,221	-923
Auto Tire Store	0	34	-34
Carwash Full Service	191	192	-1
Communication Or Utility	0	0	0
Convenience Store 16hr	2,120	5,359	-3,239
Convenience Store 24hr	3,860	1,680	2,180
Fast Food No Drive-Thru	2,514	6,540	-4,026
Financial Inst Drive-Thru	0	3,424	-3,424
Fire or Police Station	1,016	1,016	0
Furniture Store	0	1,211	-1,211
Industrial Park	7,538	10,076	-2,538
Light-Industrial General	1,242	4,791	-3,549
Low-Rise Office	0	380	-380
Low-Rise Office (<100,000 sf)	0	4,676	-4,676
Low-Rise Hotel/Motel	909	909	0
Medical Office (>1000sf)	822	824	-2
Mobile Home Park	0	445	-445
Multi-Family High Density	41,660	4,039	37,621
Multi-Family Low Density	496	680	-184
Neighborhood Commercial	0	660	-660
Nursery	0	905	-905
Office < 5 ksf	256	403	-147
Office 5-10 ksf	1,667	538	1,129

Table 5-1 Trip Generation – Preferred Plan

Land Use	Total Trips – Preferred Plan	Total Trips – Base Year	Change in Trips
Office 10-20 ksf	575	286	289
Office 20-35 ksf	497	1,008	-511
Office 35-50 ksf	5,453	0	5,453
Office 50-75 ksf	1,041	0	1,041
Office 75-140 ksf	0	0	0
Office > 140 ksf	0	0	0
Open Space Park	10	10	0
Other Group Quarters	0	2	-2
Other Public Service	1,063	1,074	-11
Other Recreation-Low	0	1	-1
Parking	0	0	0
Public Storage	203	203	0
Rail / Transit Station	381	381	0
Restaurant	0	1,369	-1,369
Restaurant Hi Turnover	3,342	4,330	-988
Restaurant Quality	1,378	477	901
Service Station	1,082	1,082	0
Service Station w/ Food Mart	1,502	3,305	-1,803
Single Family	2,512	2,530	-18
Single Family Multi-Unit	0	72	-72
Streetfront Commercial	31,134	22,013	9,121
Warehousing	1,331	1,470	-139
Total	**116,130**	**93,602**	**22,528**

Source: City of San Diego (2017); Chen Ryan Associates (2017)

Notes:
Land use quantities are representative of those within TAZ No. 2895, 2956, 2995, 3045, 3066, 3077, 3097, 3126, 4687, 4688, 4689, 4690, 4691, 4692.

As shown, implementation of the Preferred Plan would result in an increase of approximately 22,528 additional future trips within the project study area TAZs when compared to Existing Conditions.

5.1 Roadway Segment Analysis

Table 5-2 displays the level of service analysis results for the study area roadway segments under both the Preferred Plan and Existing Conditions. The proposed Preferred Plan roadway classifications are displayed in Figure 5-1, while the forecast ADT and LOS results are shown in Figure 5-2.

Table 5-2 Roadway Segment Level of Service – Preferred Plan

Roadway	Segment	Preferred Plan					Existing Conditions					Δ V/C	SI?
		Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS		
Gesner Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	4,100	0.51	C	2-Lane Collector (w/o TWLTL)	8,000	3,556	0.44	C	0.07	N
Clairemont Drive	I-5 NB Ramps to Denver St	4-Lane Major Arterial	40,000	35,400	0.89	**E**	4-Lane Major Arterial	40,000	28,929	0.72	C	0.17	**Y**
Ingulf Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	5,200	0.65	D	2-Lane Collector (w/o TWLTL)	8,000	5,185	0.65	D	0.00	N
Denver Street	Clairemont Dr to Ingulf St	2-Lane Collector (w/o TWLTL)	8,000	11,400	1.43	**F**	2-Lane Collector (w/o TWLTL)	8,000	10,064	1.26	**F**	0.17	**Y**
Morena Boulevard	North of Gesner St	3-Lane Collector (w/TWLTL)[1]	22,500	12,900	0.57	C	4-Lane Major Arterial	40,000	13,508	0.34	A	0.23	N
	Gesner St to Ingulf St	3-Lane Collector (w/ TWLTL)[1]	22,500	11,200	0.50	C	4-Lane Major Arterial	40,000	11,397	0.28	A	0.22	N
	Ingulf St to Milton St	3-Lane Collector (w/ TWLTL)[1]	22,500	17,100	0.76	D	4-Lane Major Arterial	40,000	14,805	0.37	A	0.39	N
	Milton St to Ashton St	3-Lane Collector (w/ TWLTL)[1]	22,500	14,700	0.65	C	4-Lane Major Arterial	40,000	16,362	0.41	B	0.24	N
	Ashton St to W. Morena Blvd	3-Lane Collector (w/ TWLTL)[1]	22,500	16,100	0.72	D	4-Lane Major Arterial	40,000	15,598	0.39	B	0.33	N
	W. Morena Blvd to Knoxville St	2-Lane Collector (w/o TWLTL)	8,000	9,200	1.15	**F**	2-Lane Collector (w/o TWLTL)	8,000	9,171	1.15	**F**	0.00	N
	Knoxville St to Tecolote Rd	4-Lane Collector (w/o TWLTL)	15,000	18,100	1.21	**F**	4-Lane Collector (w/o TWLTL)	15,000	17,469	1.16	**F**	0.05	N[2]
	Tecolote Rd to Buenos Ave	2-Lane Collector (w/ TWLTL)	15,000	25,100	1.67	**F**	2-Lane Collector (w/ TWLTL)	15,000	16,020	1.07	**F**	0.60	N[2]
	Buenos Ave to W. Morena Blvd	*Segment removed*					2-Lane Collector (w/ TWLTL)	15,000	16,603	1.11	**F**	N/A	
	Buenos Ave to Cushman Ave	2-Lane Collector (w/ TWLTL)	15,000	17,600	1.17	**F**	*Segment does not exist*					N/A	N[2]
	Cushman Ave to Sherman St	2-Lane Collector (w/ TWLTL)	15,000	22,400	1.49	**F**	*Segment does not exist*					N/A	N[2]
	Sherman St to Linda Vista Rd	2-Lane Collector (w/ TWLTL)	15,000	18,200	1.21	**F**	*Segment does not exist*					N/A	N[2]

Table 5-2 Roadway Segment Level of Service – Preferred Plan

Roadway	Segment	Preferred Plan					Existing Conditions					Δ V/C	SI?
		Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS		
West Morena Boulevard	Morena Blvd to Vega St	3-Lane Collector (w/ TWLTL)[1]	22,500	12,000	0.53	C	4-Lane Major Arterial	40,000	11,129	0.28	A	0.25	N
	Vega St to Buenos Ave	4-Lane Major Arterial	40,000	13,400	0.34	A	5-Lane Major Arterial	45,000	11,014	0.24	A	0.10	N
	Buenos Ave to Cushman Ave	4-Lane Major Arterial	40,000	11,900	0.50	C	5-Lane Major Arterial	45,000	13,312	0.30	A	0.20	N
	Cushman Ave to Sherman St	4-Lane Major Arterial	40,000	12,000	0.50	C	4-Lane Major Arterial	40,000	29,808	0.75	C	-0.25	N
	Sherman St to Linda Vista Rd	4-Lane Major Arterial	40,000	33,200	0.83	D	4-Lane Major Arterial	40,000	23,023	0.58	C	0.25	N
Morena Boulevard	South of Linda Vista Road	4-Lane Major Arterial	40,000	50,800	1.27	**F**	4-Lane Major Arterial	40,000	40,067	1.00	**F**	0.27	**Y**
Napa Street	Morena Blvd to Linda Vista Rd	*Closed to vehicular traffic*					4-Lane Collector (w/o TWLTL)	15,000	24,812	1.65	**F**	N/A	
	Linda Vista Rd to Riley St	4-Lane Major Arterial	40,000	22,300	0.56	C	4-Lane Major Arterial	40,000	17,681	0.44	B	0.12	N
	Riley St to Friars Rd	4-Lane Major Arterial	40,000	14,800	0.37	A	4-Lane Major Arterial	40,000	13,920	0.35	A	0.02	N
Milton Street	East of Morena Blvd	2-Lane Collector (w/o TWLTL)	8,000	3,800	0.48	C	2-Lane Collector (w/o TWLTL)	8,000	3,821	0.48	C	0.00	N
Knoxville Street	Morena Blvd to Savannah St	2-Lane Collector (w/o TWLTL)	8,000	1,700	0.21	A	2-Lane Collector (w/o TWLTL)	8,000	1,149	0.14	A	0.07	N
Sea World Dr / Tecolote Rd	Morena Blvd to I-5 NB Ramps	4-Lane Major Arterial	40,000	30,300	0.76	D	4-Lane Major Arterial	40,000	24,513	0.61	C	0.15	N
Linda Vista Road	Morena Blvd to Napa St	4-Lane Major Arterial	40,000	28,100	0.70	C	4-Lane Major Arterial	40,000	22,603	0.57	C	0.13	N
	Napa St to Marian Wy	4-Lane Collector (w/ TWLTL)	30,000	26,900	0.90	**E**	4-Lane Collector (w/ TWLTL)	30,000	26,868	0.90	**E**	0.00	N
Friars Road	Napa St to Colusa St	4-Lane Major Arterial	40,000	16,900	0.42	B	4-Lane Major Arterial	40,000	19,550	0.49	B	-0.07	N
	West of Napa St	4-Lane Major Arterial	40,000	20,500	0.51	B	4-Lane Major Arterial	40,000	9,355	0.23	A	0.28	N

Table 5-2 Roadway Segment Level of Service – Preferred Plan

Roadway	Segment	Preferred Plan					Existing Conditions					Δ V/C	SI?
		Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS		
Cushman Avenue	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	6,500	0.43	B	*Segment does not exist*					N/A	N
Sherman Street	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	8,300	0.55	C	*Segment does not exist*					N/A	N

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:

Bold letter indicates LOS E or F

[1] The 3-Lane Collector (w/ TWLTL) includes 2-lanes northbound, 1-lane southbound, and a two-way left-turn lane.

[2] Intersections at the ends of the segment and peak hour arterial analysis for the same segment are calculated to operate at an acceptable LOS with the project. Therefore, the project impacts are not significant.

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Figure 5-1
Roadway Classifications - Preferred Plan Conditions

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Figure 5-2
Daily Traffic Volumes and Roadway Level of Service - Preferred Plan Conditions

As shown, all study roadways are projected to operate at LOS D or better under Preferred Plan conditions with the exception of the following segments:

- Clairemont Drive, from I-5 NB Ramps to Denver Street (LOS E)
- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to Cushman Avenue (LOS F)
- Morena Boulevard, from Cushman Avenue to Sherman Street (LOS F)
- Morena Boulevard, from Sherman Street to Linda Vista Road (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)

It is important to note that six of the ten segments listed above currently experience LOS E or F under existing conditions.

Based on the criteria documented in Chapter 2, the following roadway segments will have a significant impact under buildout of the Preferred Plan:

- Clairemont Drive, from I-5 NB Ramps to Denver Street (LOS E, ΔVC 0.17)
- Denver Street, from Clairemont Drive to Ingulf Street (LOS F, ΔVC 0.17)
- Morena Boulevard, south of Linda Vista Road (LOS F, ΔVC 0.27)

An HCM peak hour arterial analysis was conducted for the roadway segments identified as operating at a LOS E or F. This analysis calculates the average speed of the roadway segment based upon the traffic flow and operations of adjacent intersections as documented in Table 5-3. Peak hour arterial analyses were conducted using Synchro 9.0 Traffic Analysis software. Peak hour arterial analysis worksheets are provided as Appendix H.

Based on the results of the HCM arterial analysis, the following study roadway segments operate at LOS E or F during the AM and/or PM peak hour(s):

- Clairemont Drive, from I-5 NB Ramps to Denver Street
- Denver Street, from Clairemont Drive to Ingulf Street
- (West) Morena Boulevard, south of Linda Vista Road

The HCM arterial analysis for the Morena Boulevard segment from Knoxville Street to Linda Vista Road shows an overall acceptable LOS. In addition, the bounding intersections of this segment are also anticipated to operate at acceptable LOS. Therefore, the five study segments of Morena Boulevard from Knoxville Street to Linda Vista Road are not considered to have significant impacts.

Table 5-3 Peak Hour Arterial Analysis for Roadway Segments Operating at LOS E or F

		AM				PM			
		EB/NB		WB/SB		EB/NB		WB/SB	
Roadway	Segment	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS
Clairemont Drive	I-5 NB Ramps to Denver St	10.8	**F**	16.4	**E**	7.6	**F**	5.9	**F**
Denver Street	Clairemont Dr to Ingulf St	11.2	D	5.2	**F**	10.8	D	8.5	**E**
Morena Boulevard	W. Morena Blvd to Knoxville St	17.1	C	20.6	B	17.1	C	18.5	C
	Knoxville St to Tecolote Rd	8.4	**E**	3.1	**F**	6.0	**F**	2.5	**F**
	Tecolote Rd to Buenos Ave	12.6	D	19.1	B	11.9	D	17.5	C
	Buenos Ave to Cushman Ave	11.6	D	10.2	D	12.1	D	10.1	D
	Cushman Ave to Sherman St	11.7	D	15.4	C	13.7	C	12.1	D
	Sherman St to Linda Vista Rd	11.5	D	4.9	**F**	9.1	D	3.3	**F**
	South of Linda Vista Rd	10.9	**F**	15.9	**E**	8.4	**F**	18	D

Source: Chen Ryan Associates (2017)

5.2 Intersection Analysis

AM and PM peak hour intersection LOS analyses were conducted under Preferred Plan and Existing Conditions. The proposed intersection geometrics and forecast AM/PM peak hour turning movement volumes under Preferred Plan buildout conditions are provided in Figure 5-3 and Figure 5-4, respectively. Forecast intersection turning movement volumes for each leg were developed based on the model projected growth and distributed based on the growth of the receiving leg.

Table 5-4 displays intersection level of service and average vehicle delay results for study area intersections under Preferred Plan and Existing Conditions. Level of service calculation worksheets are provided in Appendix I. As shown in Table 5-4, all key study intersections are projected to operate at LOS D or better under Preferred Plan conditions, with the exception of the following:

1. E. Mission Bay Drive & Clairemont Drive (LOS F: AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (LOS F: AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (LOS E: PM Peak Hour)
14. Morena Boulevard & Savannah Street (LOS F: PM Peak Hour)

It is important to note that two of the four intersections listed above (intersection #1 & #14) currently experience LOS E or F during the AM and/or PM peak period under existing conditions. Additionally, one intersection experiencing LOS E or F under existing conditions will be improved to a satisfactory LOS through implementation of the Preferred Plan (intersection #26).

Based on the criteria documented in Chapter 2, the following intersections will have a significant impact under buildout of the Preferred Plan:

1. E. Mission Bay Drive & Clairemont Drive (AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (PM Peak Hour)
14. Morena Boulevard & Savannah Street (PM Peak Hour)

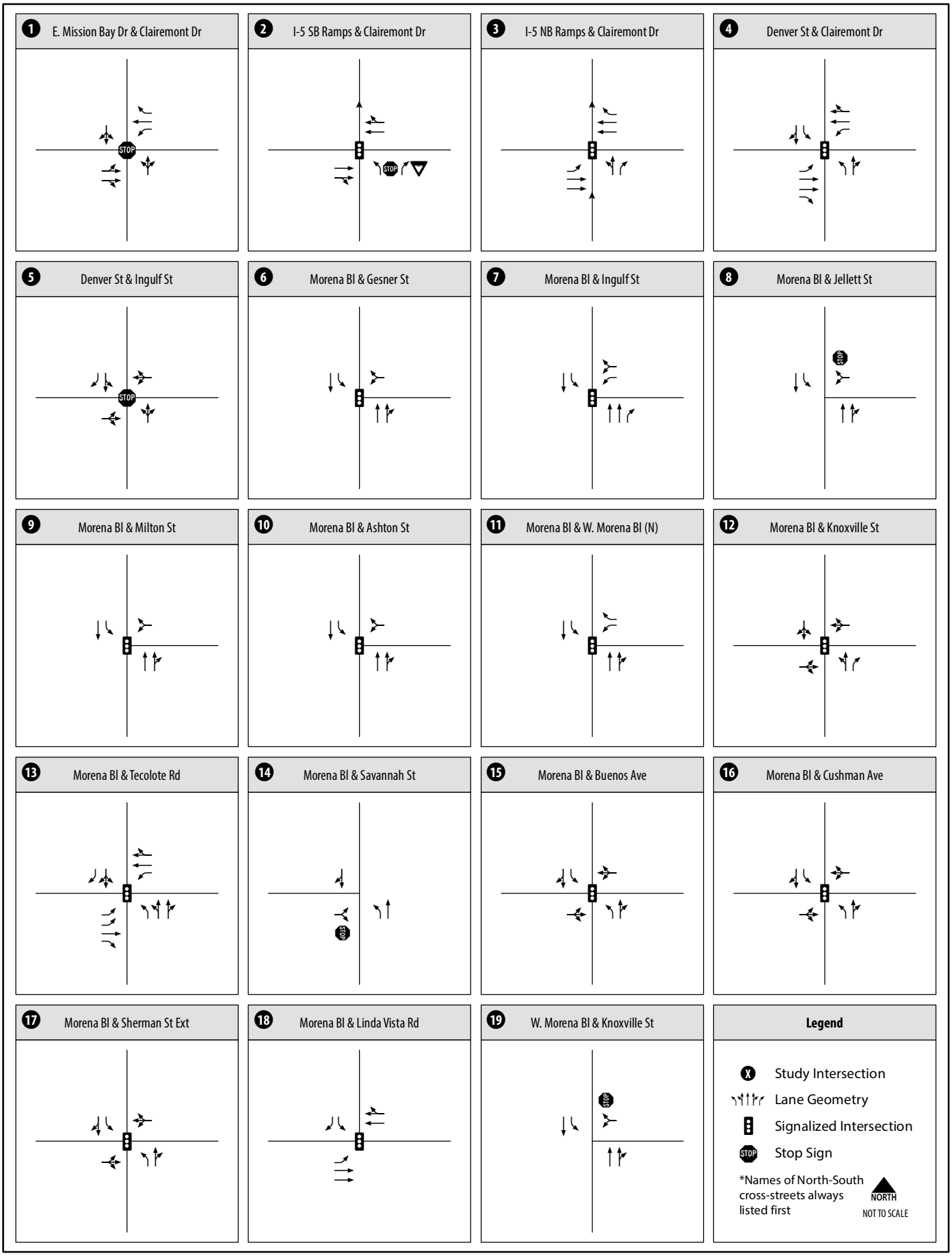

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Figure 5-3
Intersection Geometrics - Preferred Plan Conditions
(Intersections 1-19)

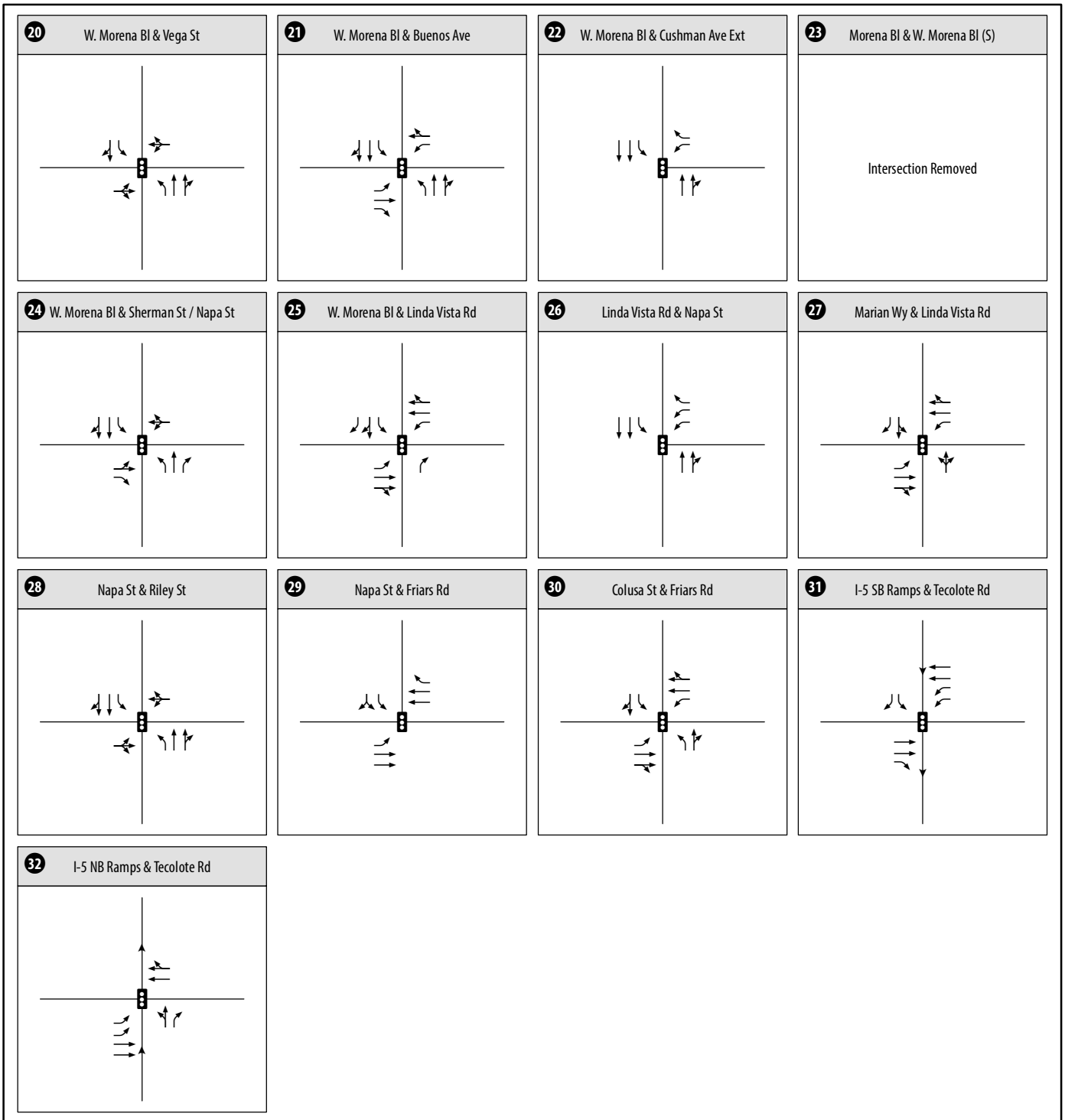

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Figure 5-3
Intersection Geometry - Preferred Plan Conditions
(Intersections 20-32)

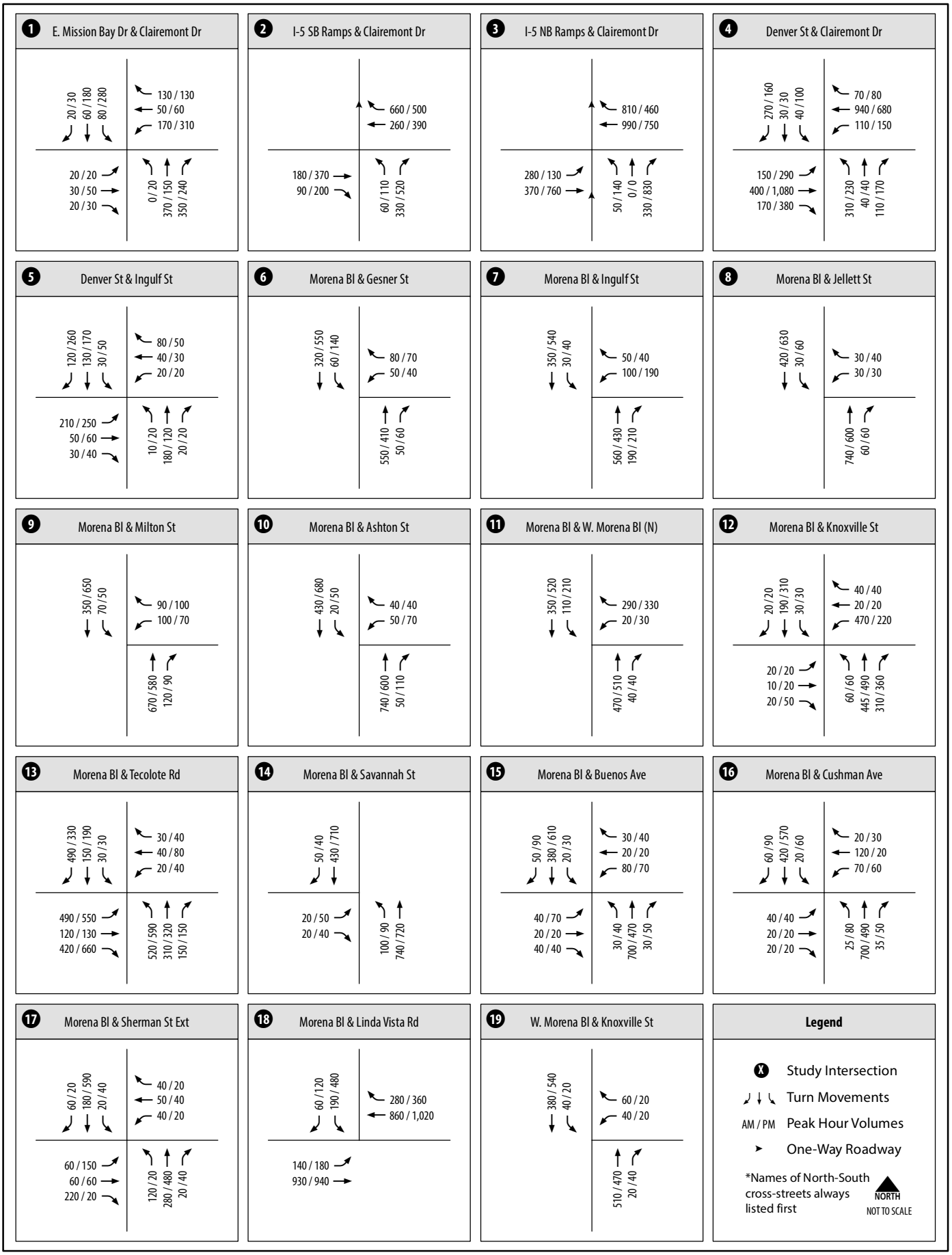

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Figure 5-4
Peak Hour Turning Movement Volumes - Preferred Plan Conditions
(Intersections 1-19)

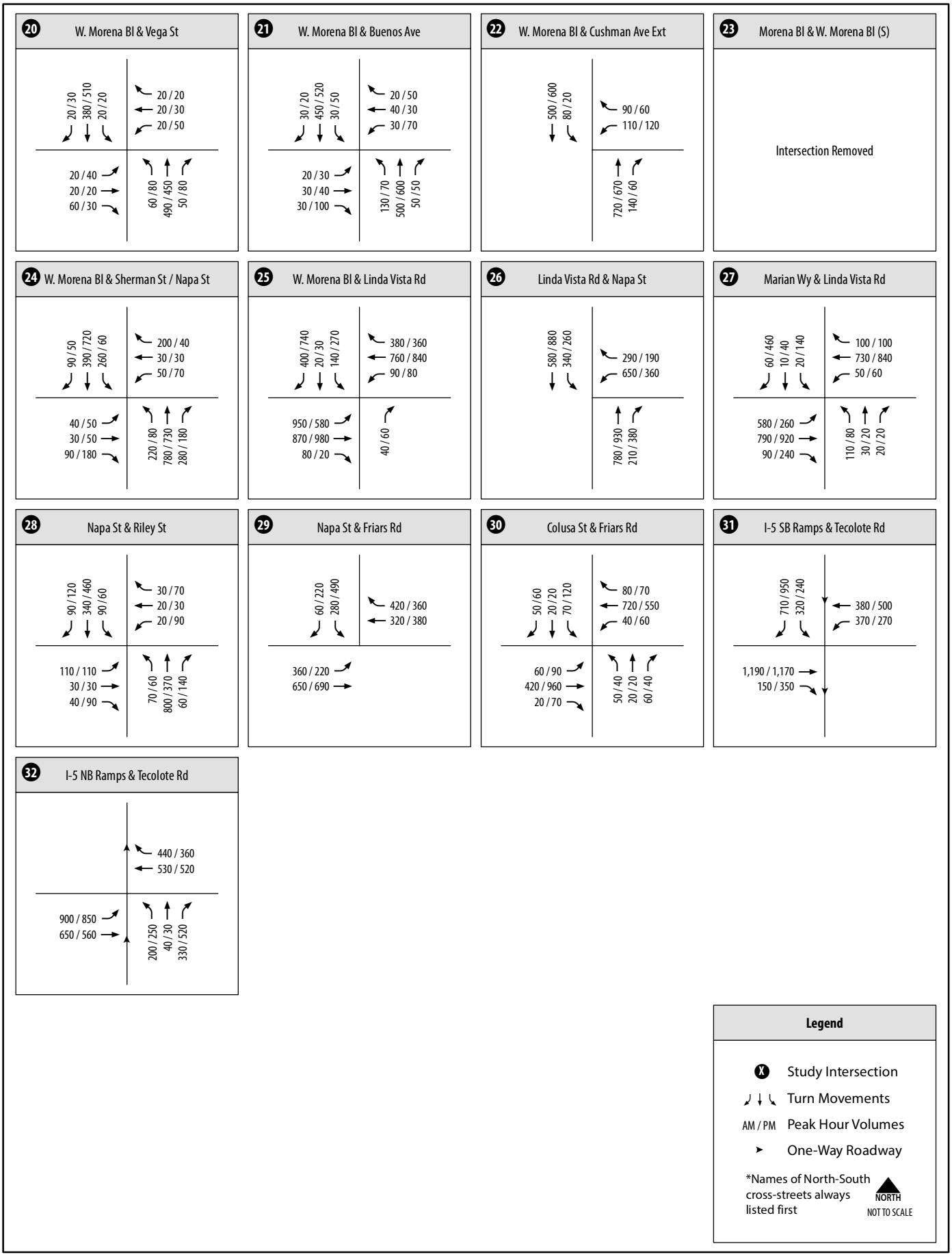

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Figure 5-4
Peak Hour Turning Movement Volumes - Preferred Plan Conditions
(Intersections 20-32)

Table 5-4 Peak Hour Intersection Level of Service Results – Preferred Plan

No.	Intersection	Control (Preferred Plan)	Preferred Plan AM Avg. Delay (sec)	Preferred Plan AM LOS	Preferred Plan PM Avg. Delay (sec)	Preferred Plan PM LOS	Existing Conditions AM Avg. Delay (sec)	Existing Conditions AM LOS	Existing Conditions PM Avg. Delay (sec)	Existing Conditions PM LOS	Δ in AM Delay (sec)	Δ in PM Delay (sec)	SI?[1] AM/PM
1	E. Mission Bay Dr & Clairemont Dr[1]	AWSC	98.6	**F**	74.1	**F**	11.3	B	41.6	**E**	87.3	32.5	**Y / Y**
2	I-5 SB Ramps & Clairemont Dr[1]	SSSC	11.7	B	26.7	D	11.7	B	16.8	C	0.0	9.9	N / N
3	I-5 NB Ramps & Clairemont Dr	Signalized	15.5	B	52.0	D	11.5	B	9.7	A	4.0	46.2	N / N
4	Denver St & Clairemont Dr	Signalized	112.5	**F**	97.3	**F**	37.6	D	23.9	C	74.9	73.4	**Y / Y**
5	Denver St & Ingulf St	AWSC	12.1	B	14.8	B	9.9	A	14.8	B	2.2	0.0	N / N
6	Morena Blvd & Gesner St	Signalized	9.3	A	10.4	B	8.3	A	10.4	B	1.0	0.0	N / N
7	Morena Blvd & Ingulf St	Signalized	24.8	C	12.2	B	7.2	A	9.8	A	17.6	2.4	N / N
8	Morena Blvd & Jellett St	SSSC	19.0	C	46.5	**E**	15.5	C	18.1	C	3.5	28.4	N / **Y**
9	Morena Blvd & Milton St	Signalized	11.2	B	9.5	A	10.0	B	7.8	A	1.2	1.7	N / N
10	Morena Blvd & Ashton St	Signalized	10.6	B	9.2	A	4.9	A	6.5	A	5.7	2.7	N / N
11	Morena Blvd & W. Morena Blvd (north split)	Signalized	9.4	A	10.1	B	11.2	B	11.4	B	-1.8	-1.3	N / N
12	Morena Blvd & Knoxville St	Signalized	28.0	C	12.0	B	21.6	C	11.4	B	6.4	0.6	N / N
13	Morena Blvd & Tecolote Rd	Signalized	38.8	D	39.8	D	30.1	C	32.7	C	8.7	7.1	N / N
14	Morena Blvd & Savannah St	SSSC	30.2	D	97.7	**F**	18.9	C	37.9	**E**	11.3	59.8	N / **Y**
15	Morena Blvd & Buenos St	Signalized	14.4	B	15.6	B	14.0	B	13.3	B	0.4	2.3	N / N
16	Morena Blvd & Cushman Ave	Signalized	19.4	B	17.6	B	*Does not exist*				N/A	N/A	N / N
17	Morena Blvd & Sherman St Extension	Signalized	10.5	B	23.2	C	*Does not exist*				N/A	N/A	N / N
18	Morena Blvd & Linda Vista Rd	Signalized	15.3	B	49.6	D	*Does not exist*				N/A	N/A	N / N
19	W. Morena Blvd & Knoxville St	SSSC	17.2	C	18.3	C	*Does not exist*				N/A	N/A	N / N
20	W. Morena Blvd & Vega St	Signalized	12.4	B	14.7	B	5.6	A	9.5	A	6.8	5.2	N / N
21	W. Morena Blvd & Buenos St	Signalized	15.2	B	15.9	B	12.8	B	13.1	B	2.4	2.8	N / N
22	W. Morena Blvd & Cushman Ave Extension	Signalized	15.0	B	11.5	B	*Does not exist*				N/A	N/A	N / N
23	W. Morena Blvd & Morena Blvd (south split)	Signalized	*Intersection removed*				8.7	A	14.7	B	N/A	N/A	N/A
24	W. Morena Blvd & Napa St & Sherman St	Signalized	35.4	D	17.2	B	46.4	D	50.7	D	-11.0	-33.5	N / N
25	W. Morena Blvd & Linda Vista Rd	Signalized	48.8	D	45.4	D	13.3	B	20.0	B	35.5	25.4	N / N

Table 5-4 Peak Hour Intersection Level of Service Results – Preferred Plan

No.	Intersection	Control (Preferred Plan)	Preferred Plan AM Avg. Delay (sec)	Preferred Plan AM LOS	Preferred Plan PM Avg. Delay (sec)	Preferred Plan PM LOS	Existing Conditions AM Avg. Delay (sec)	Existing Conditions AM LOS	Existing Conditions PM Avg. Delay (sec)	Existing Conditions PM LOS	Δ in AM Delay (sec)	Δ in PM Delay (sec)	SI?[1] AM/PM
26	Linda Vista Rd & Napa St	Signalized	31.7	C	36.1	D	51.4	D	77.7	**E**	-19.7	-41.6	N / N
27	Marian Wy & Linda Vista Rd	Signalized	53.8	D	37.4	D	36.0	D	17.9	B	27.7	19.5	N / N
28	Napa St & Riley St	Signalized	17.2	B	16.2	B	14.5	B	14.4	B	2.7	1.8	N / N
29	Napa St & Friars Rd	Signalized	17.2	B	21.9	C	19.3	B	13.6	B	-2.1	8.3	N / N
30	Colusa St & Friars Rd	Signalized	12.4	B	13.9	B	11.2	B	12.0	B	1.2	1.9	N / N
31	I-5 SB Ramps & Tecolote Rd[1]	Signalized	30.9	C	26.3	C	20.2	C	12.9	B	10.7	13.4	N / N
32	I-5 NB Ramps & Tecolote Rd[1]	Signalized	32.0	C	38.3	D	34.6	C	33.3	C	-2.6	5.0	N / N

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:
[1] Intersection not analyzed in Morena Boulevard Station Area Planning Study Final Report (February 2014).
Bold letter indicates substandard LOS.
AWSC = All-Way Stop-Control.
SSSC = Side Street Stop-Control.
SI = Significant Impact

5.3 Freeway Segment Analysis

Based on a buildout year of 2035, neither the Revenue Constrained Alternative of SANDAG's *San Diego Forward Plan* (October 2015) nor the Preferred Plan recommend freeway improvements within the project study area.

Table 5-5a and Table 5-5b display freeway segment analysis results within the project study area during the AM and PM peak periods, respectively. HCS worksheets are provided in Appendix J.

As shown, all key freeway segments are projected to operate at LOS D or better under Preferred Plan conditions, with the exception of the following:

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

Based on the criteria documented in Chapter 2, the Preferred Plan would have a significant impact to all freeway segments listed above.

5.4 Ramp Metering Analysis

Table 5-6 provides a comparison of the freeway ramp metering analysis results for Preferred Plan and Existing Conditions.

As shown, peak hour demand under Preferred Plan conditions is anticipated to exceed the meter rate and result in a delay greater than 15-minutes at the following locations:

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

5.5 Pedestrian

Implementation of the Preferred Plan will not increase hazards to utilize any existing pedestrian facilities. The Preferred Plan will strengthen connections and provide for improved pedestrian mobility throughout the study area. All street improvements should be designed consistent with the City of San Diego's Street Design Manual (2002) for the respective classification, where feasible, which includes provisions to accommodate pedestrians.

Table 5-5a Preferred Plan AM Freeway Segment Level of Service Results

Freeway	Segment	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	ADT	Preferred Plan				Existing		Δ in Speed	SI?
								Peak Hr Volume	Speed	Density	LOS	Speed	LOS		
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	57%	7%	4%	197,000	7,860	60.4	34.9	D	66.7	D	-6.3	N
		SB	4M+1A	43%	7%	4%		5,930	68.2	23.3	C	69.9	C	-1.7	N
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	57%	7%	3%	236,000	9,416	62.4	32.3	D	64.6	D	-2.2	N
		SB	5M	43%	7%	3%		7,101	68.8	22.1	C	69.4	C	-0.6	N
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	57%	7%	3%	223,000	8,898	53.9	44.1	**E**	58.7	**E**	-4.8	**Y**
		SB	4M+2A	43%	7%	3%		6,712	62.8	28.5	D	64.1	C	-1.3	N
	I-8 to Old Town Ave	NB	4M+1A	54%	8%	5%	236,000	10,195	39.2	70.2	**F**	51.8	**F**	-12.6	**Y**
		SB	5M	46%	8%	5%		8,685	61.8	30.3	D	64.4	C	-2.6	N
I-8	Sports Arena Blvd to I-5	EB	3M+1A	36%	7%	1%	118,000	5,758	62.0	32.7	D	66.4	D	-4.4	N
		WB	3M+1A	64%	7%	1%		3,682	69.9	18.6	C	70.0	B	-0.1	N
	I-5 to Morena Blvd	EB	4M+1A	44%	7%	1%	154,000	4,743	70.0	17.9	B	70.0	B	0.0	N
		WB	5M	56%	7%	1%		6,037	65.0	19.6	C	65.0	B	0.0	N
	Morena Blvd to Hotel Circle	EB	4M+1A	44%	7%	3%	220,000	6,776	62.6	28.9	D	64.7	C	-2.1	N
		WB	5M	56%	7%	3%		8,624	62.2	29.6	D	64.6	C	-2.4	N

Source: SANDAG (2017); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor
SI = Significant Impact

Table 5-5b Preferred Plan PM Freeway Segment Level of Service Results

Freeway	Segment	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	ADT	Preferred Plan				Existing		Δ in Speed	SI?
								Peak Hr Volume	Speed	Density	LOS	Speed	LOS		
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	57%	7%	4%	197,000	7,250	63.5	30.6	D	68.1	C	-4.6	N
		SB	4M+1A	43%	7%	4%		8,510	56.4	40.5	**E**	64.7	D	-8.3	**Y**
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	57%	7%	3%	236,000	8,685	65.0	28.6	D	66.6	D	-1.6	N
		SB	5M	43%	7%	3%		10,195	58.9	37.0	**E**	61.8	D	-2.9	**Y**
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	57%	7%	3%	223,000	8,206	58.6	37.4	**E**	62.3	D	-3.7	**Y**
		SB	4M+2A	43%	7%	3%		9,634	45.5	56.6	**F**	51.8	**F**	-6.3	**Y**
	I-8 to Old Town Ave	NB	4M+1A	54%	8%	5%	236,000	6,608	62.9	28.3	D	64.7	C	-1.8	N
		SB	5M	46%	8%	5%		9,912	57.3	37.4	**E**	62.3	D	-5.0	**Y**
I-8	Sports Arena Blvd to I-5	EB	3M+1A	36%	7%	1%	118,000	2,974	70.0	15.0	B	70.0	B	0.0	N
		WB	3M+1A	64%	7%	1%		5,286	64.9	28.7	D	68.0	C	-3.1	N
	I-5 to Morena Blvd	EB	4M+1A	44%	7%	1%	154,000	6,899	65.5	27.9	D	68.6	C	-3.1	N
		WB	5M	56%	7%	1%		5,421	65.0	17.6	B	65.0	B	0.0	N
	Morena Blvd to Hotel Circle	EB	4M+1A	44%	7%	3%	220,000	9,680	45.1	57.4	**F**	56.0	**E**	-10.9	**Y**
		WB	5M	56%	7%	3%		7,920	63.8	26.5	D	65.0	C	-1.2	N

Source: SANDAG (2017); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor
SI = Significant Impact

Table 5-6 Ramp Metering Analysis – Preferred Plan

Location	Peak Hour	# of SOV Lanes	# of HOV Lanes	Preferred Plan					Existing Conditions					SI?
				Peak Hr Demand[1] (veh/hr) per lane	Meter Rate[2] (veh/hr) per lane	Excess Demand[3] (veh/hr) per lane	Delay[4] (min)	Queue[5] (ft)	Peak Hr Demand[1] (veh/hr) per lane	Meter Rate[2] (veh/hr) per lane	Excess Demand[3] (veh/hr) per lane	Delay[4] (min)	Queue[5] (ft)	
I-5 SB On-Ramp / EB Clairemont Dr	AM	1	0	90	318	0	0.0	0	74	318	0	0	0	N
	PM	1	0	200	318	0	0.0	0	152	318	0	0	0	N
I-5 SB On-Ramp / WB Clairemont Dr	AM	1	1	540	492	48	5.9	1392	327	492	0	0	0	N
	PM	1	1	450	492	0	0.0	0	554	492	62	7.56	1798	N
I-5 NB On-Ramp / Clairemont Dr	AM	1	1	981	677	304	26.9	8816	816	677	139	12.32	4031	**Y**
	PM	1	1	531	492	39	4.8	1131	404	492	0	0	0	N
I-5 SB On-Ramp / Sea World Dr	AM	1	1	468	366	102	16.7	2958	365	366	0	0	0	**Y**
	PM	1	1	560	350	210	36.0	6090	439	350	89	15.26	2581	**Y**
I-5 NB On-Ramp / Sea World Dr	AM	2	0	678	965	0	0.0	0	640	965	0	0	0	N
	PM	2	0	607	972	0	0.0	0	548	972	0	0	0	N

Source: Chen Ryan Associates (2017)

Notes:

SOV = Single Occupancy Vehicle

HOV = High Occupancy Vehicle

[1] Demand is the peak hour demand expected to use the on-ramp, derived from peak hour turning movement volumes

[2] Meter Rate is the peak hour capacity expected to be processed through the ramp meter. This value was obtained from Caltrans and reflects the most restrictive meter rates unless otherwise noted.

[3] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater

[4] Delay = (Excess Demand / Meter Rate) X 60 min/hr

[5] Queue = (Excess Demand) X 29 ft/veh

SI = Significant Impact

5.6 Bicycle

Implementation of the Preferred Plan will not increase hazards to utilize any existing bicycle facilities. The Preferred Plan will strengthen connections and provide for improved bicycle mobility throughout the study area. All street improvements should be designed consistent with the City of San Diego's Street Design Manual (2017) for the respective classification, where feasible, which includes provisions to accommodate cyclists.

5.7 Transit

Implementation of the Preferred Plan will not increase hazards to utilize any existing transit facilities. The Preferred Plan will strengthen multimodal connections to the planned Mid-Coast Trolley stations at W. Morena Boulevard and Tecolote Road, and Morena Boulevard and Clairemont Drive, as well as existing transit stations throughout the study area.

5.8 Significant Impacts and Mitigation Measures

This section identifies recommended mitigation measures for intersection and roadway facilities that would be significantly impacted through implementation of the Preferred Plan.

5.8.1 Roadway Mitigation Measures

Clairemont Drive, from I-5 NB Ramps to Denver Street – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS C. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

Denver Street, from Clairemont Drive to Ingulf Street – Improving the roadway from a 2-Lane Collector without Two-Way Left-Turn Lane to a 2-Lane Collector with Two-Way Left-Turn Lane would improve the operations to LOS D. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

Morena Boulevard, south of Linda Vista Road – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS E. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

5.8.2 Intersection Mitigation Measures

1. *E. Mission Bay Drive and Clairemont Drive (LOS F: AM and PM Peak Hour)* – Under implementation of the Preferred Plan, the northbound movement is projected to operate over capacity during the AM Peak Hour, and the southbound movement is projected to operate over capacity during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection
    - Restripe the northbound approach to include a dedicated right-turn lane

If both mitigation measures identified above are implemented, the proposed improvements would result in the following intersection delay and level of service:

AM: 13.7 seconds of delay | LOS B
PM: 25.6 seconds of delay | LOS C

An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

4. *Denver Street and Clairemont Drive (LOS F: AM and PM Peak Hour)* – The eastbound left-turn movement, the westbound through movement, and the southbound left-turn movement operate over capacity under Preferred Plan conditions during the AM Peak Hour. The eastbound left-turn movement, eastbound through movement, westbound left-turn movement, southbound left-turn movement operate over capacity under Preferred Plan conditions during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Widen the northbound approach to accommodate an additional northbound left-turn lane
    - Widen the southbound approach to include an exclusive right-turn lane

    If both mitigation measures identified above are implemented, the proposed improvements would result in the following intersection delay and level of service:

    AM: 52.9 seconds of delay | LOS D
    PM: 43.3 seconds of delay | LOS D

8. *Morena Boulevard and Jellett Street (LOS E: PM Peak Hour)* – The westbound movement operates over capacity during the PM Peak Hour under implementation of the Preferred Plan. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 15.4 seconds of delay | LOS B
    PM: 7.6 seconds of delay | LOS A

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

14. *Morena Boulevard and Savannah Street (LOS F: PM Peak Hour)* – The eastbound movement operates over capacity during the PM Peak Hour under implementation of the Preferred Plan. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

AM: 10.7 seconds of delay | LOS B
PM: 18.5 seconds of delay | LOS B

An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

5.8.3 Freeway Segment Mitigation Measures

Southbound Interstate 5, between Grand Avenue/Garnett Avenue and Clairemont Drive (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Southbound Interstate 5, between Clairemont Drive and Sea World Drive/Tecolote Road (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Northbound Interstate 5, between Sea World Drive/Tecolote Road and I-8 (AM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Northbound and Southbound Interstate 5, between Sea World Drive/Tecolote Road and I-8 (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Northbound Interstate 5, between Interstate 8 and Old Town Avenue (AM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050.

Southbound Interstate 5, between Interstate 8 and Old Town Avenue (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050.

Eastbound Interstate 8, between Morena Boulevard and Hotel Circle (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050.

5.8.4 Ramp Meter Mitigation Measures

The following two (2) ramps are anticipated to be impacted under the Preferred Plan:

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

The City of San Diego shall coordinate with Caltrans to increase ramp capacity at these impacted on-ramp locations. Such improvements may include additional lanes, interchange reconfiguration, Transportation Demand Measures (TDM), etc.; however, specific capacity improvements are still undetermined, as these are future improvements that must be defined more over time. Furthermore, implementation of freeway improvements in a timely manner is beyond the full control of the City since Caltrans has approval authority over freeway improvements. Additionally, the Preferred Plan includes a variety of transit, pedestrian, and bicycle facilities that may help to reduce single-occupancy vehicle (SOV) travel which can help improve capacity.

5.8.5 Pedestrian Mitigation Measures

Implementation of the Preferred Plan will not increase hazards to utilize any existing pedestrian facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

5.8.6 Bicycle Mitigation Measures

Implementation of the Preferred Plan will not increase hazards to utilize any existing bicycle facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

5.8.7 Transit Mitigation Measures

Implementation of the Preferred Plan will not increase hazards to utilize any existing transit facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

6.0 Mid-Density Alternative

This chapter assesses the potential traffic impacts of the Mid-Density Alternative by comparing it to Existing Conditions. The Mid-Density Alternative mobility network is identical to the network presented in the previous Preferred Plan chapter, with only land use designations changing in select locations. Evaluations are provided for roadway segment and intersection peak hour operations, and freeway segment and ramp meter operations.

The Mid-Density Alternative forecast traffic volumes were developed utilizing the SANDAG Series 12 Mid-Density Alternative Future Year 2035 model. Final SANDAG Series 12 Forecast Model Results for Year 2035 Mid-Density Alternative, including Base Year manual adjustments, are provided in Appendix K.

Table 6-1 presents a comparison of the Mid-Density Alternative and Base Year land use quantities and resulting trip generation for TAZs within the study area.

Table 6-1 Trip Generation – Mid-Density Alternative

Land Use	Total Trips – Mid-Density	Total Trips – Base Year	Change in Trips
Active Park	37	37	0
Auto Commercial	0	2,181	-2,181
Auto Parts Sale	1,768	1,768	0
Auto Repair Shop	884	1,221	-337
Auto Tire Store	34	34	0
Carwash Full Service	191	192	-1
Communication Or Utility	0	0	0
Convenience Store 16hr	3,859	5,359	-1,500
Convenience Store 24hr	3,860	1,680	2,180
Fast Food No Drive-Thru	2,514	6,540	-4,026
Financial Inst Drive-Thru	0	3,424	-3,424
Fire or Police Station	1,016	1,016	0
Furniture Store	129	1,211	-1,082
Industrial Park	9,106	10,076	-970
Light-Industrial General	2,463	4,791	-2,328
Low-Rise Office	0	380	-380
Low-Rise Office (<100,000 sf)	0	4,676	-4,676
Low-Rise Hotel/Motel	909	909	0
Medical Office (>1000sf)	822	824	-2
Mobile Home Park	0	445	-445
Multi-Family High Density	27,802	4,039	23,763
Multi-Family Low Density	496	680	-184
Neighborhood Commercial	0	660	-660
Nursery	403	905	-502
Office < 5 ksf	380	403	-23
Office 5-10 ksf	310	538	-228

Table 6-1 Trip Generation – Mid-Density Alternative

Land Use	Total Trips – Mid-Density	Total Trips – Base Year	Change in Trips
Office 10-20 ksf	575	286	289
Office 20-35 ksf	2,712	1,008	1,704
Office 35-50 ksf	778	0	778
Office 50-75 ksf	1,041	0	1,041
Office 75-140 ksf	1,823	0	1,823
Office > 140 ksf	3,984	0	3,984
Open Space Park	10	10	0
Other Group Quarters	0	2	-2
Other Public Service	1,063	1,074	-11
Other Recreation-Low	0	1	-1
Parking	0	0	0
Public Storage	203	203	0
Rail / Transit Station	381	381	0
Restaurant	0	1,369	-1,369
Restaurant Hi Turnover	3,342	4,330	-988
Restaurant Quality	1,378	477	901
Service Station	1,082	1,082	0
Service Station w/ Food Mart	1,502	3,305	-1,803
Single Family	2,656	2,530	126
Single Family Multi-Unit	0	72	-72
Streetfront Commercial	27,706	22,013	5,693
Warehousing	1,331	1,470	-139
Total	**108,550**	**93,602**	**14,948**

Source: City of San Diego (2017); Chen Ryan Associates (2017)

Notes:
Land use quantities are representative of those within TAZ No. 2895, 2956, 2995, 3045, 3066, 3077, 3097, 3126, 4687, 4688, 4689, 4690, 4691, 4692.

As shown, implementation of the Mid-Density Alternative would result in an increase of approximately 14,948 trips within the project study area TAZs when compared to Existing Conditions.

6.1 Roadway Segment Analysis

Table 6-2 displays the level of service analysis results for the study area roadway segments under both the Mid-Density Alternative and Existing Conditions. The proposed roadway classifications are identical to those under Preferred Plan conditions displayed in Figure 5-1. Forecast ADT and LOS results for Mid-Density Alternative conditions are displayed in Figure 6-1.

Table 6-2 Roadway Segment Level of Service Mid-Density Alternative

		Mid-Density Alternative					Existing Conditions						
Roadway	Segment	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Δ V/C	SI?
Gesner Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	4,100	0.51	C	2-Lane Collector (w/o TWLTL)	8,000	3,556	0.44	C	0.07	N
Clairemont Drive	I-5 NB Ramps to Denver St	4-Lane Major Arterial	40,000	34,600	0.87	D	4-Lane Major Arterial	40,000	28,929	0.72	C	0.15	N
Ingulf Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	5,100	0.64	D	2-Lane Collector (w/o TWLTL)	8,000	5,185	0.65	D	-0.01	N
Denver Street	Clairemont Dr to Ingulf St	2-Lane Collector (w/o TWLTL)	8,000	10,800	1.35	**F**	2-Lane Collector (w/o TWLTL)	8,000	10,064	1.26	**F**	0.09	**Y**
Morena Boulevard	North of Gesner St	3-Lane Collector (w/ TWLTL)[1]	22,500	12,800	0.57	A	4-Lane Major Arterial	40,000	13,508	0.34	A	0.23	N
	Gesner St to Ingulf St	3-Lane Collector (w/ TWLTL)[1]	22,500	11,300	0.50	C	4-Lane Major Arterial	40,000	11,397	0.28	A	0.22	N
	Ingulf St to Milton St	3-Lane Collector (w/ TWLTL)[1]	22,500	17,200	0.76	D	4-Lane Major Arterial	40,000	14,805	0.37	A	0.39	N
	Milton St to Ashton St	3-Lane Collector (w/ TWLTL)[1]	22,500	14,800	0.66	C	4-Lane Major Arterial	40,000	16,362	0.41	B	0.25	N
	Ashton St to W. Morena Blvd	3-Lane Collector (w/ TWLTL)[1]	22,500	16,000	0.71	D	4-Lane Major Arterial	40,000	15,598	0.39	B	0.32	N
	W. Morena Blvd to Knoxville St	2-Lane Collector (w/o TWLTL)	8,000	9,700	1.21	**F**	2-Lane Collector (w/o TWLTL)	8,000	9,171	1.15	**F**	0.06	N[2]
	Knoxville St to Tecolote Rd	4-Lane Collector (w/o TWLTL)	15,000	17,800	1.19	**F**	4-Lane Collector (w/o TWLTL)	15,000	17,469	1.16	**F**	0.03	N[2]
	Tecolote Rd to Buenos Ave	2-Lane Collector (w/ TWLTL)	15,000	24,600	1.64	**F**	2-Lane Collector (w/ TWLTL)	15,000	16,020	1.07	**F**	0.57	N[2]
	Buenos Ave to W. Morena Blvd	*Segment removed*					2-Lane Collector (w/ TWLTL)	15,000	16,603	1.11	**F**	N/A	
	Buenos Ave to Cushman Ave	2-Lane Collector (w/ TWLTL)	15,000	17,900	1.19	**F**	*Segment does not exist*					N/A	N[2]
	Cushman Ave to Sherman St	2-Lane Collector (w/ TWLTL)	15,000	21,600	1.44	**F**	*Segment does not exist*					N/A	N[2]
	Sherman St to Linda Vista Rd	2-Lane Collector (w/ TWLTL)	15,000	17,500	1.17	**F**	*Segment does not exist*					N/A	N[2]

Table 6-2 Roadway Segment Level of Service Mid-Density Alternative

		Mid-Density Alternative					Existing Conditions						
Roadway	Segment	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Δ V/C	SI?
West Morena Boulevard	Morena Blvd to Vega St	3-Lane Collector (w/ TWLTL)[1]	22,500	11,000	0.49	C	4-Lane Major Arterial	40,000	11,129	0.28	A	0.21	N
	Vega St to Buenos Ave	4-Lane Major Arterial	40,000	14,300	0.36	A	5-Lane Major Arterial	45,000	11,014	0.24	A	0.12	N
	Buenos Ave to Cushman Ave	4-Lane Major Arterial	40,000	12,900	0.32	A	5-Lane Major Arterial	45,000	13,312	0.30	A	0.02	N
	Cushman Ave to Sherman St	4-Lane Major Arterial	40,000	11,100	0.28	A	4-Lane Major Arterial	40,000	29,808	0.75	C	-0.47	N
	Sherman St to Linda Vista Rd	4-Lane Major Arterial	40,000	31,600	0.79	D	4-Lane Major Arterial	40,000	23,023	0.58	C	0.21	N
Morena Boulevard	South of Linda Vista Road	4-Lane Major Arterial	40,000	49,300	1.23	**F**	4-Lane Major Arterial	40,000	40,067	1.00	**F**	0.23	**Y**
Napa Street	Morena Blvd to Linda Vista Rd	*Closed to vehicular traffic*					4-Lane Collector (w/o TWLTL)	15,000	24,812	1.65	**F**	N/A	
	Linda Vista Rd to Riley St	4-Lane Major Arterial	40,000	21,700	0.54	C	4-Lane Major Arterial	40,000	17,681	0.44	B	0.10	N
	Riley St to Friars Rd	4-Lane Major Arterial	40,000	15,000	0.38	B	4-Lane Major Arterial	40,000	13,920	0.35	A	0.03	N
Milton Street	East of Morena Blvd	2-Lane Collector (w/o TWLTL)	8,000	3,700	0.46	C	2-Lane Collector (w/o TWLTL)	8,000	3,821	0.48	C	-0.02	N
Knoxville Street	Morena Blvd to Savannah St	2-Lane Collector (w/o TWLTL)	8,000	1,200	0.15	A	2-Lane Collector (w/o TWLTL)	8,000	1,149	0.14	A	0.01	N
Sea World Dr / Tecolote Rd	Morena Blvd to I-5 NB Ramps	4-Lane Major Arterial	40,000	29,600	0.74	C	4-Lane Major Arterial	40,000	24,513	0.61	C	0.13	N
Linda Vista Road	Morena Blvd to Napa St	4-Lane Major Arterial	40,000	28,200	0.71	C	4-Lane Major Arterial	40,000	22,603	0.57	C	0.14	N
	Napa St to Marian Wy	4-Lane Collector (w/ TWLTL)	30,000	26,800	0.90	**E**	4-Lane Collector (w/ TWLTL)	30,000	26,868	0.90	**E**	0.00	N
Friars Road	Napa St to Colusa St	4-Lane Major Arterial	40,000	16,800	0.42	B	4-Lane Major Arterial	40,000	19,550	0.49	B	-0.07	N
	West of Napa St	4-Lane Major Arterial	40,000	20,300	0.51	B	4-Lane Major Arterial	40,000	9,355	0.23	A	0.28	N

Table 6-2 Roadway Segment Level of Service Mid-Density Alternative

		Mid-Density Alternative					Existing Conditions						
Roadway	Segment	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Δ V/C	SI?
Cushman Avenue	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	5,500	0.37	B	*Segment does not exist*					N/A	N
Sherman Street	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	8,100	0.54	C	*Segment does not exist*					N/A	N

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:

Bold letter indicates LOS E or F

[1] The 3-Lane Collector (w/ TWLTL) includes 2-lanes northbound, 1-lane southbound, and a two-way left-turn lane.

[2] Intersections at the ends of the segment and peak hour arterial analysis for the same segment are calculated to operate at an acceptable LOS with the project. Therefore, the project impacts are not significant.

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Transportation Impact Analysis
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Figure 6-1
Daily Traffic Volumes and Roadway Level of Service - Mid-Density Alternative Conditions

As shown, all study roadways are projected to operate at LOS D or better under Mid-Density Alternative conditions with the exception of the following segments:

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to Cushman Avenue (LOS F)
- Morena Boulevard, from Cushman Avenue to Sherman Street (LOS F)
- Morena Boulevard, from Sherman Street to Linda Vista Road (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

It is important to note that six of the nine segments listed above currently experience LOS E or F under existing conditions.

Based on the criteria documented in Chapter 2, the following roadway segments will have a significant impact under buildout of the Mid-Density Alternative:

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F, ΔVC 0.09)
- Morena Boulevard, south of Linda Vista Road (LOS F, ΔVC 0.23)

An HCM peak hour arterial analysis was conducted for the roadway segments identified as operating at a LOS E or F. This analysis calculates the average speed of the roadway segment based upon the traffic flow and operations of adjacent intersections as documented in Table 6-3. Peak hour arterial analyses were conducted using Synchro 9.0 Traffic Analysis software. Peak hour arterial analysis worksheets are provided as Appendix L.

Based on the results of the HCM arterial analysis, the following study roadway segments operate at LOS E or F during the AM and/or PM peak hour(s):

- Denver Street, from Clairemont Drive to Ingulf Street
- Morena Boulevard, south of Linda Vista Road

The HCM arterial analysis for the Morena Boulevard segment from West Morena Boulevard to Linda Vista Road shows an overall acceptable LOS. In addition, the bounding intersections of this segment are also anticipated to operate at acceptable LOS. Therefore, the six study segments of Morena Boulevard from West Morena Boulevard to Linda Vista Road are not considered to have significant impacts.

Table 6-3 Peak Hour Arterial Analysis for Roadway Segments Operating at LOS E or F

		AM				PM			
		EB/NB		WB/SB		EB/NB		WB/SB	
Roadway	Segment	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS
Denver Street	Clairemont Dr to Ingulf St	10.3	D	5.0	**F**	9.6	D	8.2	**E**
Morena Boulevard	W. Morena Blvd to Knoxville St	17.1	C	16.5	C	17.0	C	18.4	C
	Knoxville St to Tecolote Rd	3.7	**F**	2.6	**F**	5.0	**F**	2.7	**F**
	Tecolote Rd to Buenos Ave	11.0	D	17.9	C	10.1	D	16.5	C
	Buenos Ave to Cushman Ave	11.6	D	10.0	D	11.9	D	10.5	D
	Cushman Ave to Sherman St	11.4	D	15.4	C	14.1	C	12.1	D
	Sherman St to Linda Vista Rd	11.5	D	5.6	**F**	8.8	**E**	3.4	**F**
	South of Linda Vista Rd	12.3	**F**	15.9	**E**	10.8	**F**	18.0	D

Source: Chen Ryan Associates (2017)

6.2 Intersection Analysis

AM and PM peak hour intersection LOS analyses were conducted under Mid-Density Alternative and Existing Conditions. The proposed intersection geometrics are identical to those under Preferred Plan conditions displayed in Figure 5-3. Forecast AM/PM peak hour turning movement volumes under Mid-Density Alternative buildout conditions are provided in Figure 6-2.

Table 6-4 displays intersection level of service and average vehicle delay results for study area intersections under Mid-Density Alternative Conditions. Level of service calculation worksheets are provided in Appendix M.

As shown in Table 6-4, all key study intersections are projected to operate at LOS D or better under Mid-Density Alternative conditions, with the exception of the following:

1. E. Mission Bay Drive & Clairemont Drive (LOS F: AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (LOS F: AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (LOS E: PM Peak Hour)
14. Morena Boulevard & Savannah Street (LOS F: PM Peak Hour)

It is important to note that two of the four intersections listed above (intersection #1 & #14) currently experience LOS E or F during the AM and/or PM peak period under existing conditions. Additionally, one intersection experiencing LOS E or F under Existing Conditions will be improved to a satisfactory LOS through implementation of the Mid-Density Alternative (intersection #26).

Based on the criteria documented in Chapter 2, the following intersections will have a significant impact under buildout of the Mid-Density Alternative:

1. E. Mission Bay Drive & Clairemont Drive (AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (PM Peak Hour)
14. Morena Boulevard & Savannah Street (PM Peak Hour)

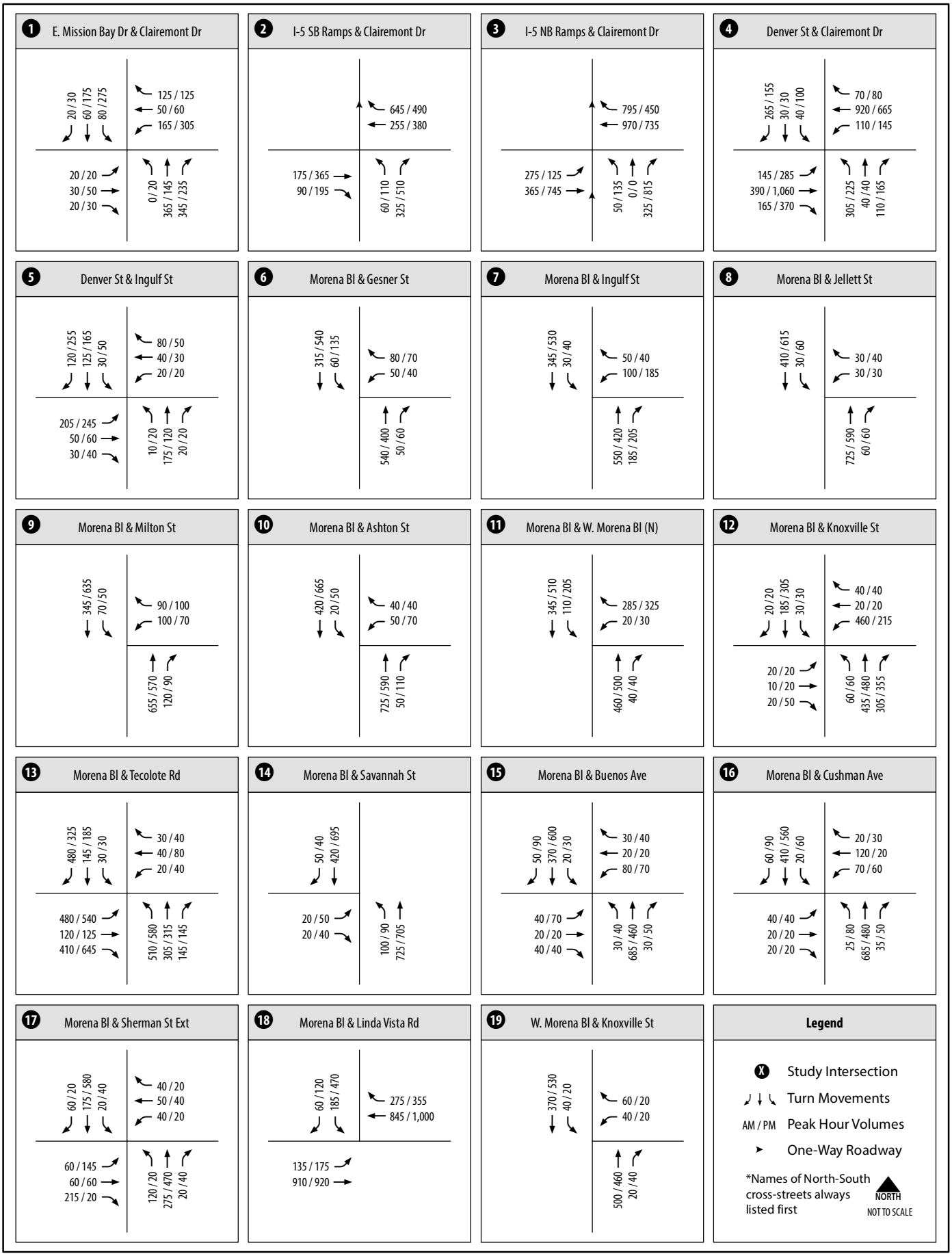

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Figure 6-2
Peak Hour Turning Movement Volumes -
Mid-Density Alternative Conditions (Intersections 1-19)

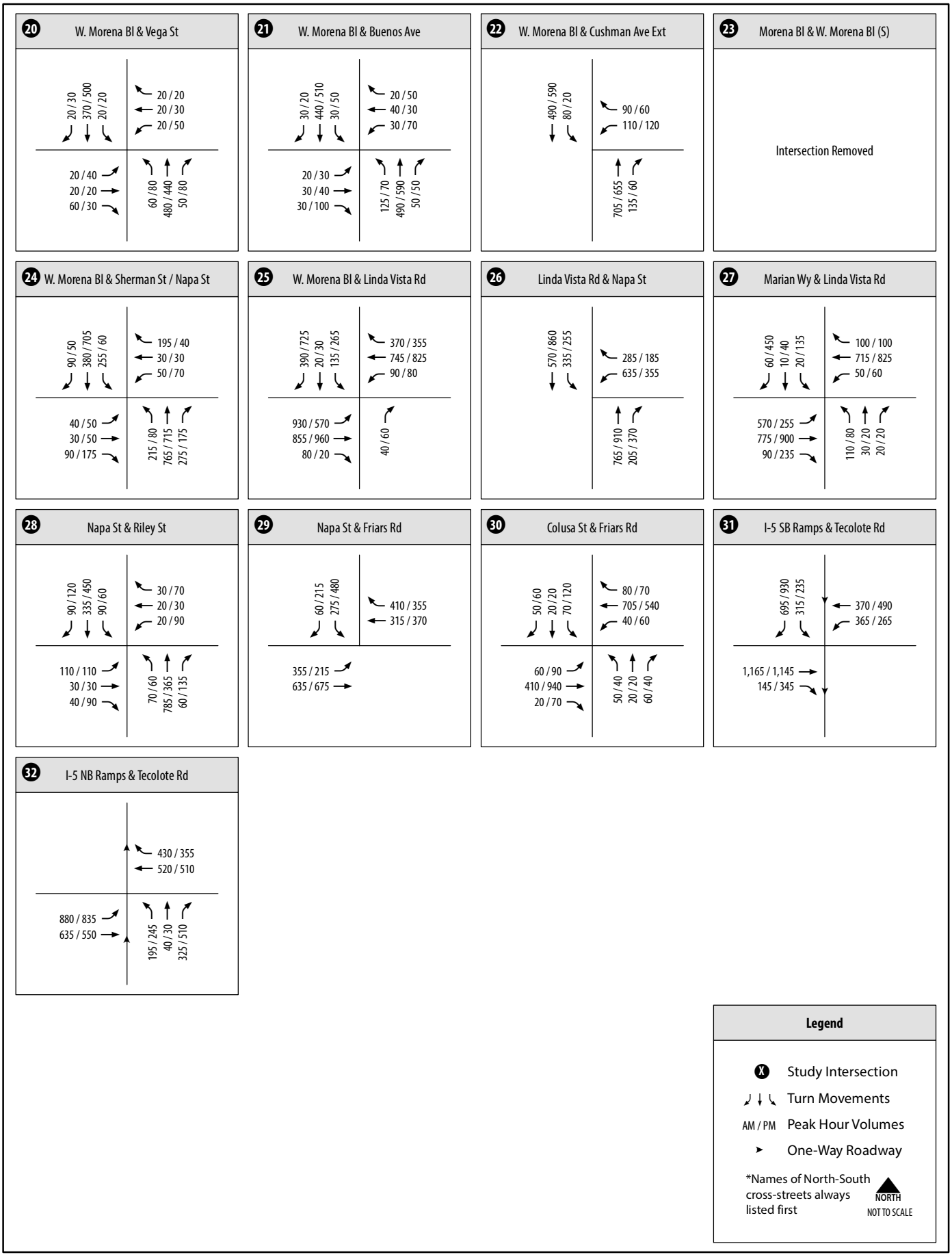

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Figure 6-2
Peak Hour Turning Movement Volumes -
Mid-Density Alternative Conditions (Intersections 20-32)

Table 6-4 Peak Hour Intersection Level of Service Results – Mid-Density Alternative

No.	Intersection	Control (Mid-Density Alternative)	Mid-Density Alternative				Existing Conditions				Δ in AM Delay (sec)	Δ in PM Delay (sec)	SI?[1] AM/PM
			AM		PM		AM		PM				
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS			
1	E. Mission Bay Dr & Clairemont Dr[1]	AWSC	93.0	**F**	67.3	**F**	11.3	B	41.6	**E**	81.7	25.7	**Y / Y**
2	I-5 SB Ramps & Clairemont Dr[1]	SSSC	11.6	B	24.8	C	11.7	B	16.8	C	-0.1	8.0	N / N
3	I-5 NB Ramps & Clairemont Dr	Signalized	15.0	B	48.7	D	11.5	B	9.7	A	3.5	39.0	N / N
4	Denver St & Clairemont Dr	Signalized	106.3	**F**	92.1	**F**	37.6	D	23.9	C	68.7	68.2	**Y / Y**
5	Denver St & Ingulf St	AWSC	11.9	B	14.0	B	9.9	A	14.8	B	2.0	-0.8	N / N
6	Morena Blvd & Gesner St	Signalized	9.3	A	10.1	B	8.3	A	10.4	B	1.0	-0.3	N / N
7	Morena Blvd & Ingulf St	Signalized	25.1	C	12.2	B	7.2	A	9.8	A	17.9	2.4	N / N
8	Morena Blvd & Jellett St	SSSC	19.1	C	42.6	**E**	15.5	C	18.1	C	3.6	24.5	N / **Y**
9	Morena Blvd & Milton St	Signalized	11.2	B	9.4	A	10.0	B	7.8	A	1.2	1.6	N / N
10	Morena Blvd & Ashton St	Signalized	10.6	B	9.2	A	4.9	A	6.5	A	5.7	2.7	N / N
11	Morena Blvd & W. Morena Blvd (north split)	Signalized	9.4	A	10.0	B	11.2	B	11.4	B	-1.8	-1.4	N / N
12	Morena Blvd & Knoxville St	Signalized	25.7	C	11.7	B	21.6	C	11.4	B	4.1	0.3	N / N
13	Morena Blvd & Tecolote Rd	Signalized	37.8	D	39.0	D	30.1	C	32.7	C	7.7	6.3	N / N
14	Morena Blvd & Savannah St	SSSC	31.8	D	88.1	**F**	18.9	C	37.9	**E**	12.9	50.2	N / **Y**
15	Morena Blvd & Buenos St	Signalized	14.4	B	15.6	B	14.0	B	13.3	B	0.4	2.3	N / N
16	Morena Blvd & Cushman Ave	Signalized	19.2	B	17.5	B	*Does not exist*				N/A	N/A	N / N
17	Morena Blvd & Sherman St Extension	Signalized	10.4	B	22.7	C	*Does not exist*				N/A	N/A	N / N
18	Morena Blvd & Linda Vista Rd	Signalized	14.5	B	44.5	D	*Does not exist*				N/A	N/A	N / N
19	W. Morena Blvd & Knoxville St	SSSC	16.8	C	17.9	C	*Does not exist*				N/A	N/A	N / N
20	W. Morena Blvd & Vega St	Signalized	12.4	B	14.7	B	5.6	A	9.5	A	6.8	5.2	N / N
21	W. Morena Blvd & Buenos St	Signalized	15.2	B	16.0	B	12.8	B	13.1	B	2.4	2.9	N / N
22	W. Morena Blvd & Cushman Ave Extension	Signalized	15.0	B	11.5	B	*Does not exist*				N/A	N/A	N / N
23	W. Morena Blvd & Morena Blvd (south split)	Signalized	*Intersection removed*				8.7	A	14.7	B	N/A	N/A	N/A
24	W. Morena Blvd & Napa St & Sherman St	Signalized	34.4	C	17.2	B	46.4	D	50.7	D	-12.0	-33.5	N / N
25	W. Morena Blvd & Linda Vista Rd	Signalized	43.6	D	42.4	D	13.3	B	20.0	B	30.3	22.4	N / N

Table 6-4 Peak Hour Intersection Level of Service Results – Mid-Density Alternative

No.	Intersection	Control (Mid-Density Alternative)	Mid-Density Alternative				Existing Conditions				Δ in AM Delay (sec)	Δ in PM Delay (sec)	SI?[1] AM/PM
			AM		PM		AM		PM				
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS			
26	Linda Vista Rd & Napa St	Signalized	30.9	C	32.7	C	51.4	D	77.7	**E**	-20.5	-45.0	N / N
27	Marian Wy & Linda Vista Rd	Signalized	46.3	D	36.7	D	36.0	D	17.9	B	10.3	18.8	N / N
28	Napa St & Riley St	Signalized	17.1	B	16.3	B	14.5	B	14.4	B	2.6	1.9	N / N
29	Napa St & Friars Rd	Signalized	17.0	B	20.4	C	19.3	B	13.6	B	-2.3	6.8	N / N
30	Colusa St & Friars Rd	Signalized	12.4	B	15.8	B	11.2	B	12.0	B	1.2	3.8	N / N
31	I-5 SB Ramps & Tecolote Rd[1]	Signalized	30.2	C	25.5	C	20.2	C	12.9	B	10.0	12.6	N / N
32	I-5 NB Ramps & Tecolote Rd[1]	Signalized	31.2	C	36.5	D	34.6	C	33.3	C	-3.4	3.2	N / N

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:
[1] Intersection not analyzed in Morena Boulevard Station Area Planning Study Final Report (February 2014).
Bold letter indicates substandard LOS.
AWSC = All-Way Stop-Control.
SSSC = Side Street Stop-Control.
SI = Significant Impact

6.3 Freeway Segment Analysis

Based on a buildout year of 2035, neither the Revenue Constrained Alternative of SANDAG's *San Diego Forward Plan* (October 2015) nor the Mid-Density Alternative recommend freeway improvements within the project study area.

Table 6-5a and Table 6-5b display freeway segment analysis results within the project study area during the AM and PM peak periods, respectively. HCS worksheets are provided in Appendix N.

As shown, all mainline freeway segments are projected to operate at LOS D or better under Mid-Density Alternative conditions, with the exception of the following:

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

Based on the criteria documented in Chapter 2, the Mid-Density Alternative would have a significant impact to all freeway segments listed above.

6.4 Ramp Metering Analysis

Table 6-6 provides a comparison of the freeway ramp metering analysis results for Mid-Density Alternative and Existing Conditions.

As shown, peak hour demand under Mid-Density Alternative conditions is anticipated to exceed the meter rate and result in a delay greater than 15-minutes at the following locations:

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

Table 6-5a Mid-Density Alternative AM Freeway Segment Level of Service Results

Freeway	Segment	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	ADT	Mid-Density Alternative				Existing		Δ in Speed	SI?
								Peak Hr Volume	Speed	Density	LOS	Speed	LOS		
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	57%	7%	4%	197,000	7,860	60.4	34.9	D	66.7	D	-6.3	N
		SB	4M+1A	43%	7%	4%		5,930	68.2	23.3	C	69.9	C	-1.7	N
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	57%	7%	3%	235,000	9,376	62.5	32.1	D	64.6	D	-2.1	N
		SB	5M	43%	7%	3%		7,074	68.9	22.0	C	69.4	C	-0.5	N
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	57%	7%	3%	223,000	8,898	53.9	44.1	**E**	58.7	**E**	-4.8	**Y**
		SB	4M+2A	43%	7%	3%		6,712	62.8	28.5	D	64.1	C	-1.3	N
	I-8 to Old Town Ave	NB	4M+1A	54%	8%	5%	234,000	10,109	40.0	68.1	**F**	51.8	**F**	-11.8	**Y**
		SB	5M	46%	8%	5%		8,611	62.0	30.0	D	64.4	C	-2.4	N
I-8	Sports Arena Blvd to I-5	EB	3M+1A	36%	7%	1%	117,000	2,948	70.0	14.9	B	66.4	D	3.6	N
		WB	3M+1A	64%	7%	1%		5,242	65.1	28.4	D	70.0	B	-4.9	N
	I-5 to Morena Blvd	EB	4M+1A	44%	7%	1%	153,000	4,712	70.0	17.8	B	70.0	B	0.0	N
		WB	5M	56%	7%	1%		5,998	65.0	19.5	C	65.0	B	0.0	N
	Morena Blvd to Hotel Circle	EB	4M+1A	44%	7%	3%	218,000	6,714	62.8	28.5	D	64.7	C	-1.9	N
		WB	5M	56%	7%	3%		8,546	62.4	29.3	D	64.6	C	-2.2	N

Source: SANDAG (2017); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor
SI = Significant Impact

Table 6-5b Mid-Density Alternative PM Freeway Segment Level of Service Results

								Mid-Density Alternative				Existing			
Freeway	Segment	Dir	Lanes[1]	D[2]	K[3]	HVF[4]	ADT	Peak Hr Volume	Speed	Density	LOS	Speed	LOS	Δ in Speed	SI?
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	46%	8%	4%	197,000	7,250	63.5	30.6	D	68.1	C	-4.6	N
		SB	4M+1A	54%	8%	4%		8,510	56.4	40.5	**E**	64.7	D	-8.3	**Y**
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	46%	8%	3%	235,000	8,648	65.1	28.4	D	66.6	D	-1.5	N
		SB	5M	54%	8%	3%		10,152	59.1	36.7	**E**	61.8	D	-2.7	**Y**
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	46%	8%	3%	223,000	8,206	58.6	37.4	**E**	62.3	D	-3.7	**Y**
		SB	4M+2A	54%	8%	3%		9,634	45.5	56.6	**F**	51.8	**F**	-6.3	**Y**
	I-8 to Old Town Ave	NB	4M+1A	40%	7%	5%	234,000	6,552	63.1	28.0	D	64.7	C	-1.6	N
		SB	5M	60%	7%	5%		9,828	57.6	36.8	**E**	62.3	D	-4.7	**Y**
I-8	Sports Arena Blvd to I-5	EB	3M+1A	61%	8%	1%	117,000	5,710	62.3	32.3	D	70.0	B	-7.7	N
		WB	3M+1A	39%	8%	1%		3,650	69.9	18.4	C	68.0	C	1.9	N
	I-5 to Morena Blvd	EB	4M+1A	56%	8%	1%	153,000	6,854	65.6	27.6	D	68.6	C	-3.0	N
		WB	5M	44%	8%	1%		5,386	65.0	17.5	B	65.0	B	0.0	N
	Morena Blvd to Hotel Circle	EB	4M+1A	55%	8%	3%	218,000	9,592	45.9	55.9	**F**	56.0	**E**	10.1	**Y**
		WB	5M	45%	8%	3%		7,848	63.9	26.2	D	65.0	C	1.1	N

Source: SANDAG (2017); Chen Ryan Associates (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane
[2] Directional Split
[3] Peak Hour Percentage
[4] Heavy Vehicle Factor
SI = Significant Impact

Table 6-6 Ramp Metering Analysis – Mid-Density Alternative

Location	Peak Hour	# of SOV Lanes	# of HOV Lanes	Mid-Density Alternative					Existing Conditions					SI?
				Peak Hr Demand[1] (veh/hr) per lane	Meter Rate[2] (veh/hr) per lane	Excess Demand[3] (veh/hr) per lane	Delay[4] (min)	Queue[5] (ft)	Peak Hr Demand[1] (veh/hr) per lane	Meter Rate[2] (veh/hr) per lane	Excess Demand[3] (veh/hr) per lane	Delay[4] (min)	Queue[5] (ft)	
I-5 SB On-Ramp / EB Clairemont Dr	AM	1	0	90	318	0	0	0	74	318	0	0	0	N
	PM	1	0	195	318	0	0	0	152	318	0	0	0	N
I-5 SB On-Ramp / WB Clairemont Dr	AM	1	1	581	492	89	10.85	2581	327	492	0	0	0	N
	PM	1	1	441	492	0	0	0	554	492	62	7.56	1798	N
I-5 NB On-Ramp / Clairemont Dr	AM	1	1	963	677	286	25.35	8294	816	677	139	12.32	4031	**Y**
	PM	1	1	527	492	35	4.27	1015	404	492	0	0	0	N
I-5 SB On-Ramp / Sea World Dr	AM	1	1	459	366	93	15.25	2697	365	366	0	0	0	**Y**
	PM	1	1	549	350	199	34.11	5771	439	350	89	15.26	2581	**Y**
I-5 NB On-Ramp / Sea World Dr	AM	2	0	655	965	0	0	0	640	965	0	0	0	N
	PM	2	0	595	972	0	0	0	548	972	0	0	0	N

Source: Chen Ryan Associates (2017)

Notes:

SOV = Single Occupancy Vehicle

HOV = High Occupancy Vehicle

[1] Demand is the peak hour demand expected to use the on-ramp, derived from peak hour turning movement volumes

[2] Meter Rate is the peak hour capacity expected to be processed through the ramp meter. This value was obtained from Caltrans and reflects the most restrictive meter rates unless otherwise noted.

[3] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater

[4] Delay = (Excess Demand / Meter Rate) X 60 min/hr

[5] Queue = (Excess Demand) X 29 ft/veh

SI = Significant Impact

6.5 Significant Impacts and Mitigation Measures

This section identifies recommended mitigation measures for intersection and roadway facilities that would be significantly impacted through implementation of the Mid-Density Alternative.

6.5.1 Roadway Mitigation Measures

Denver Street, from Clairemont Drive to Ingulf Street – Improving the roadway from a 2-Lane Collector without Two-Way Left-Turn Lane to a 2-Lane Collector with Two-Way Left-Turn Lane would improve the operations to LOS D. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

Morena Boulevard, south of Linda Vista Road – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS E. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

6.5.2 Intersection Mitigation Measures

1. *E. Mission Bay Drive and Clairemont Drive (LOS F: AM and PM Peak Hour)* – Under implementation of the Mid-Density Alternative, the northbound movement is projected to operate over capacity during the AM Peak Hour, and the southbound movement is projected to operate over capacity during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection
    - Restripe the northbound approach to include a dedicated right-turn lane

    If both mitigation measures identified above are implemented, the proposed improvements would result in the following intersection delay and level of service:

    AM: 13.6 seconds of delay | LOS B
    PM: 24.9 seconds of delay | LOS C

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

4. *Denver Street and Clairemont Drive (LOS F: AM and PM Peak Hour)* – The eastbound left-turn movement, the westbound through movement, and the southbound left-turn movement operate over capacity under Mid-Density Alternative conditions during the AM Peak Hour. The eastbound left-turn movement, eastbound through movement, westbound left-turn movement, southbound left-turn movement operate over capacity under Mid-Density Alternative conditions during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Widen the northbound approach to accommodate an additional northbound left-turn lane
    - Widen the southbound approach to include an exclusive right-turn lane

If both identified mitigation measures are implemented, the proposed improvements would result in the following intersection delay and level of service:

AM: 46.0 seconds of delay | LOS D
PM: 45.1 seconds of delay | LOS D

8. *Morena Boulevard and Jellett Street (LOS E: PM Peak Hour)* – The westbound movement operates over capacity during the PM Peak Hour under implementation of the Mid-Density Alternative. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 7.3 seconds of delay | LOS A
    PM: 7.7 seconds of delay | LOS A

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

14. *Morena Boulevard and Savannah Street (LOS F: PM Peak Hour)* – The eastbound movement operates over capacity during the PM Peak Hour under implementation of the Mid-Density Alternative. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 8.1 seconds of delay | LOS A
    PM: 11.9 seconds of delay | LOS B

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

6.5.3 Freeway Segment Mitigation Measures

Southbound Interstate 5, between Grand Avenue/Garnett Avenue and Clairemont Drive (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Southbound Interstate 5, between Clairemont Drive and Sea World Drive/Tecolote Road (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year

2050. There is some uncertainty related to the actual developments and associated traffic impacts that will materialize over time.

Northbound Interstate 5, between Sea World Drive/Tecolote Road and I-8 (AM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Northbound and Southbound Interstate 5, between Sea World Drive/Tecolote Road and I-8 (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Network includes the construction of managed lanes along this segment. These improvements are anticipated to be implemented by the year 2050.

Northbound Interstate 5, between Interstate 8 and Old Town Avenue (AM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050. There is some uncertainty related to the actual developments and associated traffic impacts that will materialize over time.

Southbound Interstate 5, between Interstate 8 and Old Town Avenue (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050.

Eastbound Interstate 8, between Morena Boulevard and Hotel Circle (PM Peak Period) – The SANDAG San Diego Forward 2050 Revenue Constrained Managed Lanes and Highway Network includes operational improvements along this segment. These improvements are anticipated to be implemented by the year 2050.

6.5.4 Ramp Meter Mitigation Measures

The following two (2) ramps are anticipated to be impacted under the Mid-Density Alternative:

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

The City of San Diego shall coordinate with Caltrans to increase ramp capacity at these impacted on-ramp locations. Such improvements may include additional lanes, interchange reconfiguration, Transportation Demand Measures (TDM), etc.; however, specific capacity improvements are still undetermined, as these are future improvements that must be defined more over time. Furthermore, implementation of freeway improvements in a timely manner is beyond the full control of the City since Caltrans has approval authority over freeway improvements. Additionally, the Mid-Density Alternative includes a variety of transit, pedestrian, and bicycle facilities that may help to reduce single-occupancy vehicle (SOV) travel which can help improve capacity.

6.5.5 Pedestrian Mitigation Measures

Implementation of the Mid-Density Alternative will not increase hazards to utilize any existing pedestrian facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

6.5.6 Bicycle Mitigation Measures

Implementation of the Mid-Density Alternative will not increase hazards to utilize any existing bicycle facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

6.5.7 Transit Mitigation Measures

Implementation of the Mid-Density Alternative will not increase hazards to utilize any existing transit facilities. No significant impacts were identified; therefore, no mitigation measures are proposed.

7.0 Low-Density Alternative

The Low-Density Alternative represents the least intense land use scenario. This chapter provides a qualitative assessment of the Low-Density Alternative by comparing the trip generation results from within the project study area. The proposed roadway network is identical to the Preferred Plan roadway network displayed in Figure 5-1.

Table 7-1 presents a comparison of the Low-Density Alternative and Base Year land use quantities and resulting trip generation for TAZs within the study area.

Table 7-1 Trip Generation Comparison – Low-Density Alternative

Land Use	Total Trips – Low Density	Total Trips – Base Year	Change in Trips
Active Park	37	37	0
Auto Commercial	0	2,181	-2,181
Auto Parts Sale	1,768	1,768	0
Auto Repair Shop	884	1,221	-337
Auto Tire Store	34	34	0
Carwash Full Service	191	192	-1
Communication Or Utility	0	0	0
Convenience Store 16hr	3,859	5,359	-1,500
Convenience Store 24hr	3,860	1,680	2,180
Fast Food No Drive-Thru	2,514	6,540	-4,026
Financial Inst Drive-Thru	0	3,424	-3,424
Fire or Police Station	1,016	1,016	0
Furniture Store	129	1,211	-1,082
Industrial Park	9,106	10,076	-970
Light-Industrial General	2,463	4,791	-2,328
Low-Rise Office	0	380	-380
Low-Rise Office (<100,000 sf)	0	4,676	-4,676
Low-Rise Hotel/Motel	909	909	0
Medical Office (>1000sf)	822	824	-2
Mobile Home Park	0	445	-445
Multi-Family High Density	21,396	4,039	17,357
Multi-Family Low Density	496	680	-184
Neighborhood Commercial	0	660	-660
Nursery	403	905	-502
Office < 5 Ksf	380	403	-23
Office 5-10 Ksf	310	538	-228
Office 10-20 Ksf	575	286	289
Office 20-35 Ksf	2,712	1,008	1,704
Office 35-50 ksf	778	0	778
Office 50-75 Ksf	1,041	0	1,041
Office 75-140 ksf	1,823	0	1,823

Table 7-1 Trip Generation Comparison – Low-Density Alternative

Land Use	Total Trips – Low Density	Total Trips – Base Year	Change in Trips
Office > 140 ksf	3,984	0	3,984
Open Space Park	10	10	0
Other Group Quarters	0	2	-2
Other Public Service	1,063	1,074	-11
Other Recreation-Low	0	1	-1
Parking	0	0	0
Public Storage	203	203	0
Rail / Transit Station	381	381	0
Restaurant	0	1,369	-1,369
Restaurant Hi Turnover	3,342	4,330	-988
Restaurant Quality	1,378	477	901
Service Station	1,082	1,082	0
Service Station w/ Food Mart	1,502	3,305	-1,803
Single Family	2,656	2,530	126
Single Family Multi-Unit	0	72	-72
Streetfront Commercial	27,706	22,013	5,693
Warehousing	1,331	1,470	-139
Total	**102,144**	**93,602**	**8,542**

Source: City of San Diego (2017); Chen Ryan Associates (2017)

Notes:
Land use quantities are representative of those within TAZ No. 2895, 2956, 2995, 3045, 3066, 3077, 3097, 3126, 4687, 4688, 4689, 4690, 4691, 4692.

As shown, implementation of the Low-Density Alternative would result in an increase of approximately 8,542 trips within the project study area TAZs when compared to Existing Conditions. However, the Low-Density Alternative will generate 13,986 fewer trips than the Preferred Plan.

7.1 Significant Impacts and Mitigation Measures

The trip generation comparison summary demonstrates the Low-Density Alternative will generate fewer trips than the Preferred Plan and Mid-Density Alternative, therefore, it is assumed the Low-Density Alternative scenario would result in impacts equal to or less than those scenarios and the same recorded mitigation measures would apply.

8.0 Adopted Community Plans

The Morena Corridor Specific Plan study area falls within the Clairemont Mesa and Linda Vista Community Planning Areas. This chapter provides a qualitative assessment of the Adopted Community Plans by comparing roadway segment analysis results to Existing Conditions.

The Adopted Community Plans forecast traffic volumes were developed utilizing the SANDAG Series 12 Adopted Community Plans Year 2035 model. Final SANDAG Series 12 Forecast Model Results for Year 2035 Adopted Community Plans, including Base Year manual adjustments, are provided in Appendix O.

Table 8-1 presents a comparison of the Adopted Community Plans and Base Year land use quantities and resulting trip generation for TAZs within the study area.

Table 8-1 Trip Generation – Adopted Community Plans

Land Use	Total Trips – Adopted	Total Trips – Base Year	Change in Trips
Active Park	37	37	0
Auto Commercial	2,181	2,181	0
Auto Parts Sale	1,768	1,768	0
Auto Repair Shop	1,201	1,221	-20
Auto Tire Store	34	34	0
Carwash Full Service	191	192	-1
Communication Or Utility	0	0	0
Convenience Store 16hr	5,360	5,359	1
Convenience Store 24hr	1,680	1,680	0
Fast Food No Drive-Thru	6,554	6,540	14
Financial Inst Drive-Thru	3,427	3,424	3
Fire or Police Station	1,016	1,016	0
Furniture Store	1,212	1,211	1
Industrial Park	9,894	10,076	-182
Light-Industrial General	6,528	4,791	1,737
Low-Rise Office	0	380	-380
Low-Rise Office (<100,000 sf)	0	4,676	-4,676
Low-Rise Hotel/Motel	909	909	0
Medical Office (>1000sf)	822	824	-2
Mobile Home Park	421	445	-24
Multi-Family High Density	6,901	4,039	2,862
Multi-Family Low Density	624	680	-56
Neighborhood Commercial	660	660	0
Nursery	905	905	0
Office < 5 ksf	1,108	403	705
Office 5-10 ksf	951	538	413
Office 10-20 ksf	1,544	286	1,258
Office 20-35 ksf	4,563	1,008	3,555

Table 8-1 Trip Generation – Adopted Community Plans

Land Use	Total Trips – Adopted	Total Trips – Base Year	Change in Trips
Office 35-50 ksf	0	0	0
Office 50-75 ksf	1,041	0	1,041
Office 75-140 ksf	0	0	0
Office > 140 ksf	0	0	0
Open Space Park	10	10	0
Other Group Quarters	2	2	0
Other Public Service	1,063	1,074	-11
Other Recreation-Low	0	1	-1
Parking	0	0	0
Public Storage	203	203	0
Rail / Transit Station	381	381	0
Restaurant	0	1,369	-1,369
Restaurant Hi Turnover	4,525	4,330	195
Restaurant Quality	1,378	477	901
Service Station	1,082	1,082	0
Service Station w/ Food Mart	3,305	3,305	0
Single Family	2,485	2,530	-45
Single Family Multi-Unit	0	72	-72
Streetfront Commercial	28,569	22,013	6,556
Warehousing	1,470	1,470	0
Total	**106,005**	**93,602**	**12,403**

Source: City of San Diego (2017); Chen Ryan Associates (2017)

Notes:
Land use quantities are representative of those within TAZ No. 2895, 2956, 2995, 3045, 3066, 3077, 3097, 3126, 4687, 4688, 4689, 4690, 4691, 4692.

As shown, implementation of the Adopted Community Plans would result in an increase of approximately 12,403 trips within the project study area TAZs when compared to Existing Conditions.

8.1 Roadway Segment Analysis

Table 8-2 displays the level of service analysis results for the study area roadway segments under both the Adopted Community Plans and Existing Conditions. The Adopted Community Plan roadway classifications are displayed in Figure 8-1, while the forecast ADT and LOS results are shown in Figure 8-2.

Table 8-2 Roadway Segment Level of Service – Adopted Community Plans

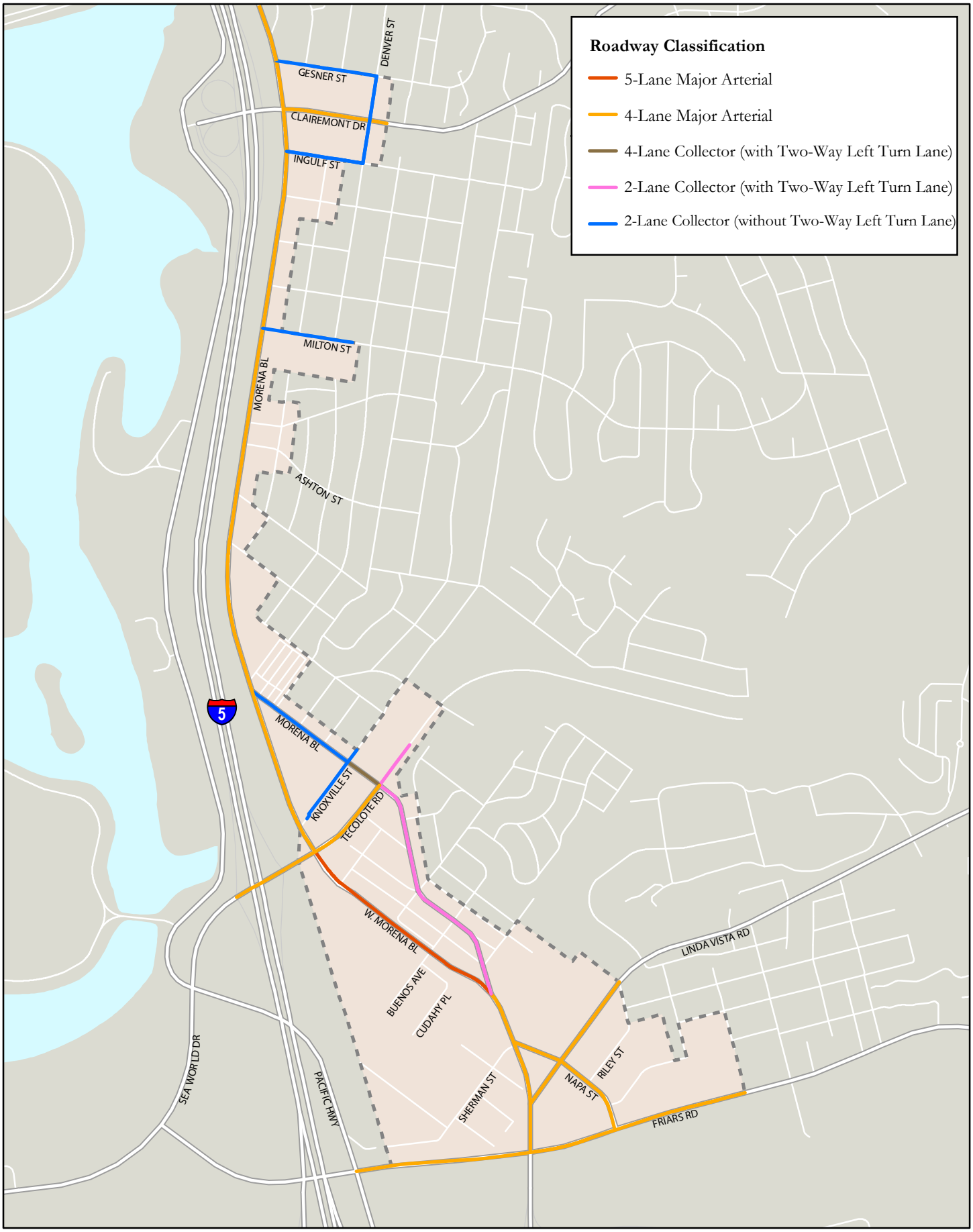
Roadway	Segment	Adopted Community Plans					Existing Conditions					Δ V/C	SI?
		Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS		
Gesner Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	4,400	0.55	C	2-Lane Collector (w/o TWLTL)	8,000	3,556	0.44	C	0.11	N
Clairemont Drive	I-5 NB Ramps to Denver St	4-Lane Major Arterial	40,000	33,400	0.84	D	4-Lane Major Arterial	40,000	28,929	0.72	C	0.12	N
Ingulf Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	8,000	5,400	0.68	D	2-Lane Collector (w/o TWLTL)	8,000	5,185	0.65	D	0.03	N
Denver Street	Clairemont Dr to Ingulf St	2-Lane Collector (w/o TWLTL)	8,000	10,900	1.36	**F**	2-Lane Collector (w/o TWLTL)	8,000	10,064	1.26	**F**	0.10	**Y**
Morena Boulevard	North of Gesner St	4-Lane Major Arterial	40,000	14,300	0.36	A	4-Lane Major Arterial	40,000	13,508	0.34	A	0.02	N
	Gesner St to Ingulf St	4-Lane Major Arterial	40,000	12,600	0.32	A	4-Lane Major Arterial	40,000	11,397	0.28	A	0.04	N
	Ingulf St to Milton St	4-Lane Major Arterial	40,000	19,200	0.48	B	4-Lane Major Arterial	40,000	14,805	0.37	A	0.11	N
	Milton St to Ashton St	4-Lane Major Arterial	40,000	16,900	0.42	B	4-Lane Major Arterial	40,000	16,362	0.41	B	0.01	N
	Ashton St to W. Morena Blvd	4-Lane Major Arterial	40,000	17,800	0.45	B	4-Lane Major Arterial	40,000	15,598	0.39	B	0.06	N
	W. Morena Blvd to Knoxville St	2-Lane Collector (w/o TWLTL)	8,000	9,100	1.14	**F**	2-Lane Collector (w/o TWLTL)	8,000	9,171	1.15	**F**	-0.01	N
	Knoxville St to Tecolote Rd	4-Lane Collector (w/o TWLTL)	15,000	16,300	1.09	**F**	4-Lane Collector (w/o TWLTL)	15,000	17,469	1.16	**F**	-0.07	N
	Tecolote Rd to Buenos Ave	2-Lane Collector (w/ TWLTL)	15,000	21,700	1.45	**F**	2-Lane Collector (w/ TWLTL)	15,000	16,020	1.07	**F**	0.38	**Y**
	Buenos Ave to W. Morena Blvd	2-Lane Collector (w/ TWLTL)	15,000	16,800	1.12	**F**	2-Lane Collector (w/ TWLTL)	15,000	16,603	1.11	**F**	0.01	N
West Morena Boulevard	Morena Blvd to Vega St	4-Lane Major Arterial	40,000	10,000	0.25	A	4-Lane Major Arterial	40,000	11,129	0.28	A	-0.03	N
	Vega St to Buenos Ave	5-Lane Major Arterial	45,000	13,500	0.30	A	5-Lane Major Arterial	45,000	11,014	0.24	A	0.06	N
	Buenos Ave to Morena Blvd	5-Lane Major Arterial	45,000	15,200	0.34	A	5-Lane Major Arterial	45,000	13,312	0.30	A	0.04	N

Table 8-2 Roadway Segment Level of Service – Adopted Community Plans

Roadway	Segment	Adopted Community Plans					Existing Conditions					Δ V/C	SI?
		Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS	Functional Classification	Maximum Capacity at LOS E	ADT	V/C	LOS		
Morena Boulevard	W. Morena Blvd to Napa St	4-Lane Major Arterial	40,000	33,200	0.83	D	4-Lane Major Arterial	40,000	29,808	0.75	C	0.08	N
	Napa St to Linda Vista Rd	4-Lane Major Arterial	40,000	19,900	0.50	B	4-Lane Major Arterial	40,000	23,023	0.58	C	-0.08	N
	South of Linda Vista Rd	4-Lane Major Arterial	40,000	45,300	1.13	**F**	4-Lane Major Arterial	40,000	40,067	1.00	**F**	0.13	**Y**
Napa Street	Morena Blvd to Linda Vista Rd	4-Lane Major Arterial	40,000	20,800	0.52	B	4-Lane Collector (w/o TWLTL)	15,000	24,812	1.65	**F**	-1.13	N
	Linda Vista Rd to Riley St	4-Lane Major Arterial	40,000	23,900	0.60	C	4-Lane Major Arterial	40,000	17,681	0.44	B	0.16	N
	Riley St to Friars Rd	4-Lane Major Arterial	40,000	18,000	0.45	B	4-Lane Major Arterial	40,000	13,920	0.35	A	0.10	N
Milton Street	East of Morena Blvd	2-Lane Collector (w/o TWLTL)	8,000	4,000	0.50	C	2-Lane Collector (w/o TWLTL)	8,000	3,821	0.48	C	0.02	N
Knoxville Street	Morena Blvd to Savannah St	2-Lane Collector (w/o TWLTL)	8,000	2,000	0.25	A	2-Lane Collector (w/o TWLTL)	8,000	1,149	0.14	A	0.11	N
Sea World Dr / Tecolote Rd	Morena Blvd to I-5 NB Ramps	4-Lane Major Arterial	40,000	29,600	0.74	C	4-Lane Major Arterial	40,000	24,513	0.61	C	0.13	N
Linda Vista Road	Morena Blvd to Napa St	4-Lane Major Arterial	40,000	32,900	0.82	D	4-Lane Major Arterial	40,000	22,603	0.57	C	0.25	N
	Napa St to Marian Wy	4-Lane Major Arterial	40,000	37,200	0.93	**E**	4-Lane Collector (w/ TWLTL)	30,000	26,868	0.90	**E**	0.03	**Y**
Friars Road	Napa St to Colusa St	4-Lane Major Arterial	40,000	19,800	0.50	B	4-Lane Major Arterial	40,000	19,550	0.49	B	0.01	N
	West of Napa St	4-Lane Major Arterial	40,000	21,800	0.55	C	4-Lane Major Arterial	40,000	9,355	0.23	A	0.32	N

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:
Bold letter indicates LOS E or F



Morena Corridor Specifc Plan
Transportation Impact Analysis
CHEN RYAN

Figure 8-1
Roadway Classification - Adopted Community Plans

Morena Corridor Specific Plan
Transportation Impact Analysis
CHEN RYAN

Figure 8-2
Daily Traffic Volumes and Roadway Level of Service - Adopted Community Plans

As shown, all study roadways are projected to operate at LOS D or better under Adopted Community Plan conditions with the exception of the following segments:

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to W. Morena Boulevard (LOS E)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

Based on the criteria documented in Chapter 2, the following roadway segments will have a significant impact under buildout of the Adopted Community Plans when compared to Existing Conditions:

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F, ΔVC 0.10)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F, ΔVC 0.38)
- Morena Boulevard, south of Linda Vista Road (LOS F, ΔVC 0.13)
- Linda Vista Road, from Napa Street to Marian Way (LOS E, ΔVC 0.03)

9.0 Summary

This chapter provides a summary of the trip generation, roadway, intersection, and freeway operating conditions under Preferred Plan, Mid-Density Alternative, and Base Year conditions.

The trip generation comparison summary provided in this Chapter also includes the Low-Density Alternative and the Adopted Community Plans.

The roadway segment analysis comparison summary provided in this Chapter also includes the Adopted Community Plans for informational purposes.

9.1 Trip Generation Summary

Table 9-1 displays the vehicle trips generated within study area TAZs, under Preferred Plan, Mid-Density Alternative, Low-Density Alternative, Adopted Community Plans, and Base Year conditions.

As shown, under buildout conditions, the Preferred Plan is estimated to generate the most daily trips, followed by the Mid-Density Alternative, the Adopted Community Plans, and the Low-Density Alternative, respectively. The fewest generated trips was found to occur under Base Year conditions.

The trip generation comparison summary demonstrates the Low-Density Alternative will generate fewer trips than the Preferred Plan and Mid-Density Alternative, therefore, it is assumed the Low-Density Alternative scenario would result in impacts equal to or less than those scenarios.

Table 9-1 Trip Generation Comparison

Land Use	Preferred Plan	Mid-Density	Low-Density	Adopted Plan	Base Year
Active Park	37	37	37	37	37
Auto Commercial	0	0	0	2,181	2,181
Auto Parts Sale	0	1,768	1,768	1,768	1,768
Auto Repair Shop	298	884	884	1,201	1,221
Auto Tire Store	0	34	34	34	34
Carwash Full Service	191	191	191	191	192
Communication Or Utility	0	0	0	0	0
Convenience Store 16hr	2,120	3,859	3,859	5,360	5,359
Convenience Store 24hr	3,860	3,860	3,860	1,680	1,680
Fast Food No Drive-Thru	2,514	2,514	2,514	6,554	6,540
Financial Inst Drive-Thru	0	0	0	3,427	3,424
Fire or Police Station	1,016	1,016	1,016	1,016	1,016
Furniture Store	0	129	129	1,212	1,211
Industrial Park	7,538	9,106	9,106	9,894	10,076
Light-Industrial General	1,242	2,463	2,463	6,528	4,791
Low-Rise Office	0	0	0	0	380
Low-Rise Office (<100,000 sf)	0	0	0	0	4,676
Low-Rise Hotel/Motel	909	909	909	909	909
Medical Office (>1000sf)	822	822	822	822	824

Table 9-1 Trip Generation Comparison

Land Use	Preferred Plan	Mid-Density	Low-Density	Adopted Plan	Base Year
Mobile Home Park	0	0	0	421	445
Multi-Family High Density	41,660	27,802	21,396	6,901	4,039
Multi-Family Low Density	496	496	496	624	680
Neighborhood Commercial	0	0	0	660	660
Nursery	0	403	403	905	905
Office < 5 ksf	256	380	380	1,108	403
Office 5-10 ksf	1,667	310	310	951	538
Office 10-20 ksf	575	575	575	1,544	286
Office 20-35 ksf	497	2,712	2,712	4,563	1,008
Office 35-50 ksf	5,453	778	778	0	0
Office 50-75 ksf	1,041	1,041	1,041	1,041	0
Office 75-140 ksf	0	1,823	1,823	0	0
Office > 140 ksf	0	3,984	3,984	0	0
Open Space Park	10	10	10	10	10
Other Group Quarters	0	0	0	2	2
Other Public Service	1,063	1,063	1,063	1,063	1,074
Other Recreation-Low	0	0	0	0	1
Parking	0	0	0	0	0
Public Storage	203	203	203	203	203
Rail / Transit Station	381	381	381	381	381
Restaurant	0	0	0	0	1,369
Restaurant Hi Turnover	3,342	3,342	3,342	4,525	4,330
Restaurant Quality	1,378	1,378	1,378	1,378	477
Service Station	1,082	1,082	1,082	1,082	1,082
Service Station w/ Food Mart	1,502	1,502	1,502	3,305	3,305
Single Family	2,512	2,656	2,656	2,485	2,530
Single Family Multi-Unit	0	0	0	0	72
Streetfront Commercial	31,134	27,706	27,706	28,569	22,013
Warehousing	1,331	1,331	1,331	1,470	1,470
Total	**116,130**	**108,550**	**102,144**	**106,005**	**93,602**

Source: City of San Diego (2017); Chen Ryan Associates (2017)

Notes:
Land use quantities are representative of those within TAZ No. 2895, 2956, 2995, 3045, 3066, 3077, 3097, 3126, 4687, 4688, 4689, 4690, 4691, 4692.

9.2 Roadway Segment Analysis Summary

Table 9-2 displays the roadway segment level of service analysis results within the project study area under Preferred Plan, Mid-Density Alternative, Adopted Community Plans, and Existing Conditions.

Table 9-2 Roadway Segment Level of Service Comparison

Roadway	Segment	Preferred Plan		Mid-Density Alternative		Adopted Community Plans		Existing Conditions	
		Functional Classification	LOS	Functional Classification	LOS	Functional Classification	LOS	Functional Classification	LOS
Gesner St	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C
Clairemont Dr	I-5 NB Ramps to Denver St	4-Lane Major Arterial	**E**	4-Lane Major Arterial	D	4-Lane Major Arterial	D	4-Lane Major Arterial	C
Ingulf Street	Morena Blvd to Denver St	2-Lane Collector (w/o TWLTL)	D	2-Lane Collector (w/o TWLTL)	D	2-Lane Collector (w/o TWLTL)	D	2-Lane Collector (w/o TWLTL)	D
Denver Street	Clairemont Dr to Ingulf St	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**
Morena Boulevard	North of Gesner St	3-Lane Collector (w/ TWLTL)[1]	C	3-Lane Collector (w/ TWLTL)[1]	C	4-Lane Major Arterial	A	4-Lane Major Arterial	A
	Gesner St to Ingulf St	3-Lane Collector (w/ TWLTL)[1]	C	3-Lane Collector (w/ TWLTL)[1]	C	4-Lane Major Arterial	A	4-Lane Major Arterial	A
	Ingulf St to Milton St	3-Lane Collector (w/ TWLTL)[1]	D	3-Lane Collector (w/ TWLTL)[1]	D	4-Lane Major Arterial	B	4-Lane Major Arterial	A
	Milton St to Ashton St	3-Lane Collector (w/ TWLTL)[1]	C	3-Lane Collector (w/ TWLTL)[1]	C	4-Lane Major Arterial	B	4-Lane Major Arterial	B
	Ashton St to W. Morena Blvd	3-Lane Collector (w/ TWLTL)[1]	D	3-Lane Collector (w/ TWLTL)[1]	D	4-Lane Major Arterial	B	4-Lane Major Arterial	B
	W. Morena Blvd to Knoxville St	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**	2-Lane Collector (w/o TWLTL)	**F**
	Knoxville St to Tecolote Rd	4-Lane Collector (w/o TWLTL)	**F**	4-Lane Collector (w/o TWLTL)	**F**	4-Lane Collector (w/o TWLTL)	**F**	4-Lane Collector (w/o TWLTL)	**F**
	Tecolote Rd to Buenos Ave	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**
	Buenos Ave to W. Morena Blvd	*Segment removed*		*Segment removed*		2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**
	Buenos Ave to Cushman Ave	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**	*Segment does not exist*		*Segment does not exist*	
	Cushman Ave to Sherman St	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**	*Segment does not exist*		*Segment does not exist*	
	Sherman St to Linda Vista Rd	2-Lane Collector (w/ TWLTL)	**F**	2-Lane Collector (w/ TWLTL)	**F**	*Segment does not exist*		*Segment does not exist*	
West Morena Boulevard	Morena Blvd to Vega St	3-Lane Collector (w/ TWLTL)[1]	C	3-Lane Collector (w/ TWLTL)[1]	C	4-Lane Major Arterial	A	4-Lane Major Arterial	A
	Vega St to Buenos Ave	4-Lane Major Arterial	A	4-Lane Major Arterial	A	5-Lane Major Arterial	A	5-Lane Major Arterial	A

Table 9-2 Roadway Segment Level of Service Comparison

Roadway	Segment	Preferred Plan		Mid-Density Alternative		Adopted Community Plans		Existing Conditions	
		Functional Classification	LOS	Functional Classification	LOS	Functional Classification	LOS	Functional Classification	LOS
West Morena Boulevard	Buenos Ave to Cushman Ave	4-Lane Major Arterial	C	4-Lane Major Arterial	A	5-Lane Major Arterial	A	5-Lane Major Arterial	A
	Cushman Ave to Sherman St	4-Lane Major Arterial	C	4-Lane Major Arterial	A	4-Lane Major Arterial	D	4-Lane Major Arterial	C
	Sherman St to Linda Vista Rd	4-Lane Major Arterial	D	4-Lane Major Arterial	D	4-Lane Major Arterial	B	4-Lane Major Arterial	C
Morena Boulevard	South of Linda Vista Road	4-Lane Major Arterial	**F**	4-Lane Major Arterial	**F**	4-Lane Major Arterial	**F**	4-Lane Major Arterial	**F**
Napa Street	Morena Blvd to Linda Vista Rd	*Closed to vehicular traffic*		*Closed to vehicular traffic*		4-Lane Major Arterial	B	4-Lane Collector (w/o TWLTL)	**F**
	Linda Vista Rd to Riley St	4-Lane Major Arterial	C	4-Lane Major Arterial	C	4-Lane Major Arterial	C	4-Lane Major Arterial	B
	Riley St to Friars Rd	4-Lane Major Arterial	A	4-Lane Major Arterial	B	4-Lane Major Arterial	B	4-Lane Major Arterial	A
Milton Street	East of Morena Blvd	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C	2-Lane Collector (w/o TWLTL)	C
Knoxville St	Morena Blvd to Savannah St	2-Lane Collector (w/o TWLTL)	A	2-Lane Collector (w/o TWLTL)	A	2-Lane Collector (w/o TWLTL)	A	2-Lane Collector (w/o TWLTL)	A
Sea World Dr / Tecolote Rd	Morena Blvd to I-5 NB Ramps	4-Lane Major Arterial	D	4-Lane Major Arterial	C	4-Lane Major Arterial	C	4-Lane Major Arterial	C
Linda Vista Road	Morena Blvd to Napa St	4-Lane Major Arterial	C	4-Lane Major Arterial	C	4-Lane Major Arterial	D	4-Lane Major Arterial	C
	Napa St to Marian Wy	4-Lane Collector (w/ TWLTL)	**E**	4-Lane Collector (w/ TWLTL)	**E**	4-Lane Major Arterial	**E**	4-Lane Collector (w/ TWLTL)	**E**
Friars Road	Napa St to Colusa St	4-Lane Major Arterial	B	4-Lane Major Arterial	B	4-Lane Major Arterial	B	4-Lane Major Arterial	B
	West of Napa St	4-Lane Major Arterial	B	4-Lane Major Arterial	B	4-Lane Major Arterial	C	4-Lane Major Arterial	A
Cushman Avenue	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	B	2-Lane Collector (w/ TWLTL)	B	*Segment does not exist*		*Segment does not exist*	
Sherman Street	W. Morena Blvd to Morena Blvd	2-Lane Collector (w/ TWLTL)	C	2-Lane Collector (w/ TWLTL)	C	*Segment does not exist*		*Segment does not exist*	

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:

Bold letter indicates LOS E or F

[1] The 3-Lane Collector (w/ TWLTL) includes 2-lanes northbound, 1-lane southbound, and a two-way left-turn lane.

As shown, the following study roadways are projected to operate at an unacceptable LOS E or F under implementation of the respective scenario:

Preferred Plan

- Clairemont Drive, from I-5 NB Ramps to Denver Street (LOS E)
- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to Cushman Avenue (LOS F)
- Morena Boulevard, from Cushman Avenue to Sherman Street (LOS F)
- Morena Boulevard, from Sherman Street to Linda Vista Road (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

Mid-Density Alternative

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to Cushman Avenue (LOS F)
- Morena Boulevard, from Cushman Avenue to Sherman Street (LOS F)
- Morena Boulevard, from Sherman Street to Linda Vista Road (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

Adopted Community Plans

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to W. Morena Boulevard (LOS E)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

Existing Conditions

- Denver Street, from Clairemont Drive to Ingulf Street (LOS F)
- Morena Boulevard, from W. Morena Boulevard to Knoxville Street (LOS F)
- Morena Boulevard, from Knoxville Street to Tecolote Road (LOS F)
- Morena Boulevard, from Tecolote Road to Buenos Avenue (LOS F)
- Morena Boulevard, from Buenos Avenue to W. Morena Boulevard (*south split*) (LOS F)
- Morena Boulevard, south of Linda Vista Road (LOS F)
- Napa Street, from Morena Boulevard to Linda Vista Road (LOS F)
- Linda Vista Road, from Napa Street to Marian Way (LOS E)

9.3 Intersection Analysis Summary

Table 9-3 displays the intersection level of service results within the project study area for the Preferred Plan, Mid-Density Alternative, and Existing Conditions.

As shown, the following study intersections are projected to operate at an unacceptable LOS E or F under implementation of the respective scenario:

Preferred Plan

1. E. Mission Bay Drive & Clairemont Drive (LOS F: AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (LOS F: AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (LOS E: PM Peak Hour)
14. Morena Boulevard & Savannah Street (LOS F: PM Peak Hour)

Mid-Density Alternative

1. E. Mission Bay Drive & Clairemont Drive (LOS F: AM & PM Peak Hour)
4. Denver Street & Clairemont Drive (LOS F: AM & PM Peak Hour)
8. Morena Boulevard & Jellett Street (LOS E: PM Peak Hour)
14. Morena Boulevard & Savannah Street (LOS F: PM Peak Hour)

Existing Conditions

1. East Mission Bay Drive & Clairemont Drive (LOS E – PM peak hour)
14. Morena Boulevard & Savannah Street (LOS E – PM peak hour)
26. Linda Vista Road & Napa Street (LOS E – PM peak hour)

Table 9-3 Peak Hour Intersection Level of Service Comparison

			Preferred Plan				Mid-Density Alternative				Existing Conditions			
			AM		PM		AM		PM		AM		PM	
No.	Intersection	Control (Preferred Plan)	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	E. Mission Bay Dr & Clairemont Dr[1]	AWSC	98.6	**F**	74.1	**F**	93.0	**F**	67.3	**F**	11.3	B	41.6	**E**
2	I-5 SB Ramps & Clairemont Dr[1]	SSSC	11.7	B	26.7	D	11.6	B	24.8	C	11.7	B	16.8	C
3	I-5 NB Ramps & Clairemont Dr	Signalized	15.5	B	52.0	D	15.0	B	48.7	D	11.5	B	9.7	A
4	Denver St & Clairemont Dr	Signalized	112.5	**F**	97.3	**F**	106.3	**F**	92.1	**F**	37.6	D	23.9	C
5	Denver St & Ingulf St	AWSC	12.1	B	14.8	B	11.9	B	14.0	B	9.9	A	14.8	B
6	Morena Blvd & Gesner St	Signalized	9.3	A	10.4	B	9.3	A	10.1	B	8.3	A	10.4	B
7	Morena Blvd & Ingulf St	Signalized	24.8	C	12.2	B	25.1	C	12.2	B	7.2	A	9.8	A
8	Morena Blvd & Jellett St	SSSC	19.0	C	46.5	**E**	19.1	C	42.6	**E**	15.5	C	18.1	C
9	Morena Blvd & Milton St	Signalized	11.2	B	9.5	A	11.2	B	9.4	A	10.0	B	7.8	A
10	Morena Blvd & Ashton St	Signalized	10.6	B	9.2	A	10.6	B	9.2	A	4.9	A	6.5	A
11	Morena Blvd & W. Morena Blvd *(north split)*	Signalized	9.4	A	10.1	B	9.4	A	10.0	B	11.2	B	11.4	B
12	Morena Blvd & Knoxville St	Signalized	28.0	C	12.0	B	25.7	C	11.7	B	21.6	C	11.4	B
13	Morena Blvd & Tecolote Rd	Signalized	38.8	D	39.8	D	37.8	D	39.0	D	30.1	C	32.7	C
14	Morena Blvd & Savannah St	SSSC	30.2	D	97.7	**F**	31.8	D	88.1	**F**	18.9	C	37.9	**E**
15	Morena Blvd & Buenos St	Signalized	14.4	B	15.6	B	14.4	B	15.6	B	14.0	B	13.3	B
16	Morena Blvd & Cushman Ave	Signalized	19.4	B	17.6	B	19.2	B	17.5	B	*Does not exist*			
17	Morena Blvd & Sherman St Extension	Signalized	10.5	B	23.2	C	10.4	B	22.7	C	*Does not exist*			
18	Morena Blvd & Linda Vista Rd	Signalized	15.3	B	49.6	D	14.5	B	44.5	D	*Does not exist*			
19	W. Morena Blvd & Knoxville St	SSSC	17.2	C	18.3	C	16.8	C	17.9	C	*Does not exist*			
20	W. Morena Blvd & Vega St	Signalized	12.4	B	14.7	B	12.4	B	14.7	B	5.6	A	9.5	A
21	W. Morena Blvd & Buenos St	Signalized	15.2	B	15.9	B	15.2	B	16.0	B	12.8	B	13.1	B
22	W. Morena Blvd & Cushman Ave Extension	Signalized	15.0	B	11.5	B	15.0	B	11.5	B	*Does not exist*			
23	W. Morena Blvd & Morena Blvd *(south split)*	Signalized	*Intersection removed*				*Intersection removed*				8.7	A	14.7	B
24	W. Morena Blvd & Napa St & Sherman St	Signalized	35.4	D	17.2	B	34.4	C	17.2	B	46.4	D	50.7	D
25	W. Morena Blvd & Linda Vista Rd	Signalized	48.8	D	45.4	D	43.6	D	42.4	D	13.3	B	20.0	B

Table 9-3 Peak Hour Intersection Level of Service Comparison

			Preferred Plan				Mid-Density Alternative				Existing Conditions			
			AM		PM		AM		PM		AM		PM	
No.	Intersection	Control (Preferred Plan)	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
26	Linda Vista Rd & Napa St	Signalized	31.7	C	36.1	D	30.9	C	32.7	C	51.4	D	77.7	**E**
27	Marian Wy & Linda Vista Rd	Signalized	53.8	D	37.4	D	46.3	D	36.7	D	36.0	D	17.9	B
28	Napa St & Riley St	Signalized	17.2	B	16.2	B	17.1	B	16.3	B	14.5	B	14.4	B
29	Napa St & Friars Rd	Signalized	17.2	B	21.9	C	17.0	B	20.4	C	19.3	B	13.6	B
30	Colusa St & Friars Rd	Signalized	12.4	B	13.9	B	12.4	B	15.8	B	11.2	B	12.0	B
31	I-5 SB Ramps & Tecolote Rd[1]	Signalized	30.9	C	26.3	C	30.2	C	25.5	C	20.2	C	12.9	B
32	I-5 NB Ramps & Tecolote Rd[1]	Signalized	32.0	C	38.3	D	31.2	C	36.5	D	34.6	C	33.3	C

Source: Morena Boulevard Station Area Planning Study Final Report (February 2014); Chen Ryan Associates (2017)

Notes:
[1] Intersection not analyzed in Morena Boulevard Station Area Planning Study Final Report (February 2014).
Bold letter indicates substandard LOS.
AWSC = All-Way Stop-Control.
SSSC = Side Street Stop-Control.

9.4 Freeway Segment Analysis Summary

Table 9-4a and Table 9-4b display the freeway segment analysis results under Preferred Plan, Mid-Density Alternative, and Existing Conditions. As shown, the following study intersections are projected to operate at an unacceptable LOS E or F under implementation of the respective scenario:

Preferred Plan

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

Mid-Density Alternative

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

Existing Conditions

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS E)

9.5 Ramp Metering Analysis Summary

Table 9-5 displays the freeway ramp metering analysis results under Preferred Plan, Mid-Density Alternative, and Existing Conditions.

Table 9-4a AM Freeway Segment Level of Service Comparison

				Preferred Plan				Mid-Density Alternative				Existing Conditions			
Freeway	Segment	Dir	Lanes[1]	ADT	Peak Hr Volume	Speed	LOS	ADT	Peak Hr Volume	Speed	LOS	ADT	Peak Hr Volume	Speed	LOS
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	197,000	7,860	60.4	D	197,000	7,860	60.4	D	162,000	6,464	66.7	D
		SB	4M+1A		5,930	68.2	C		5,930	68.2	C		4,876	69.9	C
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	236,000	9,416	62.4	D	235,000	9,376	62.5	D	221,000	8,818	64.6	D
		SB	5M		7,101	68.8	C		7,074	68.9	C		6,652	69.4	C
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	223,000	8,898	53.9	**E**	223,000	8,898	53.9	**E**	205,000	8,179	58.7	**E**
		SB	4M+2A		6,712	62.8	D		6,712	62.8	D		6,170	64.1	C
	I-8 to Old Town Ave	NB	4M+1A	236,000	10,195	39.2	**F**	234,000	10,109	40.0	**F**	203,000	8,770	51.8	**F**
		SB	5M		8,685	61.8	D		8,611	62.0	D		7,470	64.4	C
I-8	Sports Arena Blvd to I-5	EB	3M+1A	118,000	5,758	62.0	D	117,000	2,948	70.0	B	102,000	4,978	66.4	D
		WB	3M+1A		3,682	69.9	C		5,242	65.1	D		3,182	70.0	B
	I-5 to Morena Blvd	EB	4M+1A	154,000	4,743	70.0	B	153,000	4,712	70.0	B	131,000	4,035	70.0	B
		WB	5M		6,037	65.0	C		5,998	65.0	C		5,135	65.0	B
	Morena Blvd to Hotel Circle	EB	4M+1A	220,000	6,776	62.6	D	218,000	6,714	62.8	D	187,000	5,760	64.7	C
		WB	5M		8,624	62.2	D		8,546	62.4	D		7,330	64.6	C

Source: SANDAG (2017); Chen Ryan Associates, Inc. (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane

Table 9-4b PM Freeway Segment Level of Service Comparison

				Preferred Plan				Mid-Density Alternative				Existing Conditions			
Freeway	Segment	Dir	Lanes[1]	ADT	Peak Hr Volume	Speed	LOS	ADT	Peak Hr Volume	Speed	LOS	ADT	Peak Hr Volume	Speed	LOS
I-5	Grand Ave/Garnet Ave to Clairemont Dr	NB	4M+1A	197,000	7,250	63.5	D	197,000	7,250	63.5	D	162,000	5,962	68.1	C
		SB	4M+1A		8,510	56.4	**E**		8,510	56.4	**E**		6,998	64.7	D
	Clairemont Dr to Sea World Dr/Tecolote Rd	NB	5M	236,000	8,685	65.0	D	235,000	8,648	65.1	D	221,000	8,133	66.6	D
		SB	5M		10,195	58.9	**E**		10,152	59.1	**E**		9,547	61.8	D
	Sea World Dr /Tecolote Rd to I-8	NB	4M+2A	223,000	8,206	58.6	**E**	223,000	8,206	58.6	**E**	205,000	7,544	62.3	D
		SB	4M+2A		9,634	45.5	**F**		9,634	45.5	**F**		8,856	51.8	**F**
	I-8 to Old Town Ave	NB	4M+1A	236,000	6,608	62.9	D	234,000	6,552	63.1	D	203,000	5,684	64.7	C
		SB	5M		9,912	57.3	**E**		9,828	57.6	**E**		8,526	62.3	D
I-8	Sports Arena Blvd to I-5	EB	3M+1A	118,000	2,974	70.0	B	117,000	5,710	62.3	D	102,000	2,570	70.0	B
		WB	3M+1A		5,286	64.9	D		3,650	69.9	C		4,570	68.0	C
	I-5 to Morena Blvd	EB	4M+1A	154,000	6,899	65.5	D	153,000	6,854	65.6	D	131,000	5,869	68.6	C
		WB	5M		5,421	65.0	B		5,386	65.0	B		4,611	65.0	B
	Morena Blvd to Hotel Circle	EB	4M+1A	220,000	9,680	45.1	**F**	218,000	9,592	45.9	**F**	187,000	8,228	56.0	**E**
		WB	5M		7,920	63.8	D		7,848	63.9	D		6,732	65.0	C

Source: SANDAG (2017); Chen Ryan Associates, Inc. (2018)

Notes:
Bold letter indicates LOS E or F
[1] M = Mainline; A = Auxiliary Lane

Table 9-5 Ramp Metering Analysis Comparison

				Preferred Plan				Mid-Density Alternative				Existing Conditions			
Location	Peak Hour	# of SOV Lanes	# of HOV Lanes	Peak Hr Demand[1] (veh/hr) per lane	Excess Demand[2] (veh/hr) per lane	Delay[3] (min)	Queue[4] (ft)	Peak Hr Demand[1] (veh/hr) per lane	Excess Demand[2] (veh/hr) per lane	Delay[3] (min)	Queue[4] (ft)	Peak Hr Demand[1] (veh/hr) per lane	Excess Demand[2] (veh/hr) per lane	Delay[3] (min)	Queue[4] (ft)
I-5 SB On-Ramp / EB Clairemont Dr	AM	1	0	90	0	0.0	0	90	0	0	0	74	0	0	0
	PM	1	0	200	0	0.0	0	195	0	0	0	152	0	0	0
I-5 SB On-Ramp / WB Clairemont Dr	AM	1	1	540	48	5.9	1392	581	89	10.85	2581	327	0	0	0
	PM	1	1	450	0	0.0	0	441	0	0	0	554	62	7.56	1798
I-5 NB On-Ramp / Clairemont Dr	AM	1	1	981	304	26.9	8816	963	286	25.35	8294	816	139	12.32	4031
	PM	1	1	531	39	4.8	1131	527	35	4.27	1015	404	0	0	0
I-5 SB On-Ramp / Sea World Dr	AM	1	1	468	102	16.7	2958	459	93	15.25	2697	365	0	0	0
	PM	1	1	560	210	36.0	6090	549	199	34.11	5771	439	89	15.26	2581
I-5 NB On-Ramp / Sea World Dr	AM	2	0	678	0	0.0	0	655	0	0	0	640	0	0	0
	PM	2	0	607	0	0.0	0	595	0	0	0	548	0	0	0

Source: Chen Ryan Associates (2017)

Notes:

SOV = Single Occupancy Vehicle

HOV = High Occupancy Vehicle

[1] Demand is the peak hour demand expected to use the on-ramp, derived from peak hour turning movement volumes

[2] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater

[3] Delay = (Excess Demand / Meter Rate) X 60 min/hr

[4] Queue = (Excess Demand) X 29 ft/veh

As shown, peak hour demand is anticipated to exceed the meter rate at the following metered ramp locations under implementation of the respective scenario:

Preferred Plan

- I-5 NB On-Ramp / WB Clairemont Drive (AM)
- I-5 NB On-Ramp / Clairemont Drive (AM & PM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

Mid-Density Alternative

- I-5 NB On-Ramp / WB Clairemont Drive (AM)
- I-5 NB On-Ramp / Clairemont Drive (AM & PM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

Existing Conditions

- I-5 NB On-Ramp / WB Clairemont Drive (PM)
- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (PM)

9.6 Significant Impacts and Mitigations Summary

This section provides a summary of the significant impacts to the roadway, intersections, and freeway network, and identifies mitigation measures.

9.6.1 Roadway Segments

The roadway segments listed below are projected to be significantly impacted under implementation of the respective scenario. Mitigation measures are proposed for each impact, where applicable.

Preferred Plan

- *Clairemont Drive, from I-5 NB Ramps to Denver Street (LOS E, ΔVC 0.17)* – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS C. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.
- *Denver Street, from Clairemont Drive to Ingulf Street (LOS F, ΔVC 0.17)* – Improving the roadway from a 2-Lane Collector without Two-Way Left-Turn Lane to a 2-Lane Collector with Two-Way Left-Turn Lane would improve the operations to LOS D. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.
- *Morena Boulevard, south of Linda Vista Road (LOS F, ΔVC 0.27)* – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS E. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

Mid-Density Alternative

- *Denver Street, from Clairemont Drive to Ingulf Street (LOS F, ΔVC 0.09)* – Improving the roadway from a 2-Lane Collector without Two-Way Left-Turn Lane to a 2-Lane Collector with Two-Way Left-Turn Lane would improve the operations to LOS D. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.
- *Morena Boulevard, south of Linda Vista Road (LOS F, ΔVC 0.23)* – Improving the roadway from a 4-Lane Major Arterial to a 6-Lane Prime Arterial would improve the operations to LOS E. The identified significant traffic related impact to this roadway segment would be fully mitigated with the implementation of this improvement.

9.6.2 Intersections

The following intersections are projected to be significantly impacted under implementation of the respective scenario. Peak hour intersection worksheets with the mitigation measures identified are provided for the Preferred Plan and Mid-Density Alternative scenarios as Appendix P.

Preferred Plan

1. *E. Mission Bay Drive and Clairemont Drive (LOS F: AM and PM Peak Hour)* – Under implementation of the Preferred Plan, the northbound movement is projected to operate over capacity during the AM Peak Hour, and the southbound movement is projected to operate over capacity during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection
    - Restripe the northbound approach to include a dedicated right-turn lane

    If both mitigation measures identified above are implemented, the proposed improvements would result in the following intersection delay and level of service:

    AM: 13.7 seconds of delay | LOS B
    PM: 25.6 seconds of delay | LOS C

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

4. *Denver Street and Clairemont Drive (LOS F: AM and PM Peak Hour)* – The eastbound left-turn movement, the westbound through movement, and the southbound left-turn movement operate over capacity under Preferred Plan conditions during the AM Peak Hour. The eastbound left-turn movement, eastbound through movement, westbound left-turn movement, southbound left-turn movement operate over capacity under Preferred Plan conditions during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Widen the northbound approach to accommodate an additional northbound left-turn lane
    - Widen the southbound approach to include an exclusive right-turn lane

If both identified mitigation measures are implemented, the proposed improvements would result in the following intersection delay and level of service:

AM: 52.9 seconds of delay | LOS D
PM: 43.3 seconds of delay | LOS D

8. *Morena Boulevard and Jellett Street (LOS E: PM Peak Hour)* – The westbound movement operates over capacity during the PM Peak Hour under implementation of the Preferred Plan. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 15.4 seconds of delay | LOS B
    PM: 7.6 seconds of delay | LOS A

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

14. *Morena Boulevard and Savannah Street (LOS F: PM Peak Hour)* – The eastbound movement operates over capacity during the PM Peak Hour under implementation of the Preferred Plan. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 10.7 seconds of delay | LOS B
    PM: 18.5 seconds of delay | LOS B

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

Mid-Density Alternative

2. *E. Mission Bay Drive and Clairemont Drive (LOS F: AM and PM Peak Hour)* – Under implementation of the Mid-Density Alternative, the northbound movement is projected to operate over capacity during the AM Peak Hour, and the southbound movement is projected to operate over capacity during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection
    - Restripe the northbound approach to include a dedicated right-turn lane

If both mitigation measures identified above are implemented, the proposed improvements would result in the following intersection delay and level of service:

AM: 13.6 seconds of delay | LOS B
PM: 24.9 seconds of delay | LOS C

An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

4. *Denver Street and Clairemont Drive (LOS F: AM and PM Peak Hour)* – The eastbound left-turn movement, the westbound through movement, and the southbound left-turn movement operate over capacity under Mid-Density Alternative conditions during the AM Peak Hour. The eastbound left-turn movement, eastbound through movement, westbound left-turn movement, southbound left-turn movement operate over capacity under Mid-Density Alternative conditions during the PM Peak Hour. Implementing the following improvements would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Widen the northbound approach to accommodate an additional northbound left-turn lane
    - Widen the southbound approach to include an exclusive right-turn lane

    If both identified mitigation measures are implemented, the proposed improvements would result in the following intersection delay and level of service:

    AM: 46.0 seconds of delay | LOS D
    PM: 45.1 seconds of delay | LOS D

8. *Morena Boulevard and Jellett Street (LOS E: PM Peak Hour)* – The westbound movement operates over capacity during the PM Peak Hour under implementation of the Mid-Density Alternative. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

    If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

    AM: 7.3 seconds of delay | LOS A
    PM: 7.7 seconds of delay | LOS A

    An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

14. *Morena Boulevard and Savannah Street (LOS F: PM Peak Hour)* – The eastbound movement operates over capacity during the PM Peak Hour under implementation of the Mid-Density Alternative. Implementing the following improvement would allow the intersection to operate at an acceptable LOS during both peak hours:

    - Signalize the intersection

If the identified mitigation measure is implemented, the proposed improvement would result in the following intersection delay and level of service:

AM: 8.1 seconds of delay | LOS A
PM: 11.9 seconds of delay | LOS B

An analysis should be performed at this location to determine if a roundabout is feasible and will improve operations to a less than significant impact. If a roundabout is determined as feasible, it may be implemented in lieu of signalization.

9.6.3 Freeway Segments

The following freeway segments are projected to be significantly impacted under implementation of the respective scenario:

Preferred Plan

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

Mid-Density Alternative

AM Peak Period

- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 NB, between I-8 and Old Town Avenue (LOS F)

PM Peak Period

- I-5 SB, between Grand Ave/Garnet Ave and Clairemont Dr (LOS E)
- I-5 SB, between Clairemont Dr and Sea World Drive/Tecolote Road (LOS E)
- I-5 NB, between Sea World Drive/Tecolote Road and I-8 (LOS E)
- I-5 SB, between Sea World Drive/Tecolote Road and I-8 (LOS F)
- I-5 SB, between I-8 and Old Town Avenue (LOS E)
- I-8 EB, between Morena Boulevard and Hotel Circle (LOS F)

9.6.4 Freeway Ramp Meters

Metered ramp locations are anticipated to exceed the meter rate and result in a delay greater than 15-minutes at the following locations, resulting in a significant impact:

Preferred Plan

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

Mid-Density Alternative

- I-5 NB On-Ramp / Clairemont Drive (AM)
- I-5 SB On-Ramp / Sea World Drive / Tecolote Road (AM & PM)

The City of San Diego shall coordinate with Caltrans to address ramp capacity at impacted on-ramp locations. Improvements could include additional lanes, interchange reconfigurations, Transportation Demand Measures (TDM), etc.; however, specific capacity improvements are still undetermined, as these are future improvements that must be defined more over time. Furthermore, implementation of freeway improvements in a timely manner is beyond the full control of the City since Caltrans has approval authority over freeway improvements. Additionally, the Preferred Plan and Mid-Density Alternative include a variety of transit, pedestrian and bicycle facilities that may help to reduce single-occupancy vehicle (SOV) travel which can help improve ramp capacity.

10.0 Interim Implementation

Considering the complexities associated with implementing the Preferred Plan Mobility Network described in Chapter 4, a set of interim improvements were identified that would improve mobility without requiring major network modifications. A description of these improvements is provided throughout this Chapter. Some of the improvements are also included in the Preferred Plan Mobility Network, however, this list is intended to serve as a resource of those that may be implemented without necessitating major property acquisitions.

Morena Boulevard/West Morena Boulevard Two-Way Cycle Track and Lane Reduction

As noted in the TIS, the existing and forecast vehicular volumes along Morena Boulevard and West Morena Boulevard are low enough to accommodate a lane reduction in the southbound direction. Morena Boulevard from Gesner Street to West Morena Boulevard, and West Morena Boulevard from Morena Boulevard to Vega Street can be reduced to a 3-Lane Collector with Two-Way Left-Turn Lane. West Morena Boulevard from Vega Street to east of Linda Vista Road can be reduced to a 4-Lane Major Arterial.

The excess right of way provided by the lane reductions will be sufficient to accommodate the two-way cycle track along the west side of the roadway. As an interim improvement, one option is to construct the cycle track using paint and flexible bollards to avoid costly construction expenses while still providing a physically separated right of way designated for cyclists.

Adequate signage and additional treatments should be considered during the design phase, with an emphasis on the north and south termini, to provide the cyclist riding against traffic with clear direction of where to go next. A minimum 3-second lead bicycle/pedestrian phase should be provided at the West Morena Boulevard intersections with Vega Street, Buenos Avenue, and Sherman Street/Napa Street to accommodate northbound cyclists, along with signage to direct drivers turning at the intersections or driveways to yield to cyclists. The southern terminus of the two-way cycle track requires additional improvements to make access to and from the facility feasible. A conceptual design of the two-way cycle track southern terminus is depicted in Figure 4-3.

Morena Boulevard/Linda Vista Road Reconfiguration

The recommended improvements identified at this intersection under the Preferred Plan in Chapter 4 can be implemented in the interim term as they do not require the acquisition of additional right-of-way. A conceptual design of the improvements at this intersection are depicted in Figure 4-3.

Morena Boulevard/West Morena Boulevard *(south split)* Reconfiguration

Reconfigure the southern Morena Boulevard/West Morena Boulevard intersection to more of a standard intersection configuration. This can be achieved by aligning the Morena Boulevard approach to intersect with West Morena Boulevard at more of a right angle, eliminating the free movement from northbound Morena Boulevard onto Morena Boulevard, and fully signalizing the intersection.

Morena Boulevard/West Morena Boulevard *(north split)* – Square up the east leg approach from Morena Boulevard by extending the curb/sidewalk area along the north side of Morena Boulevard and reducing the curb/sidewalk area on the south side of Morena Boulevard. This improvement will shorten the pedestrian crossing distance and improve visibility. A conceptual graphic of this improvement is provided as Figure 4-2. Additionally, further study should be performed at this intersection to better understand

roundabout feasibility. The roundabout feasibility analysis may result in modifications to the additional improvements identified at this location.

Mid-Block Pedestrian Connection Across West Morena Boulevard – Consider a mid-block pedestrian connection across West Morena Boulevard, between Vega Street and Buenos Avenue, with a continental crosswalk and pedestrian hybrid beacon. This location should meet Pedestrian Hybrid Beacon (signal) warrants prior to installation.