

Appendix K

Traffic Impact Analysis for the Amanda Lane Project

LLG Engineers 2014

TRAFFIC IMPACT ANALYSIS
AMANDA LANE PROJECT
Escondido, California
February 11, 2014

LLG Ref. 3-13-2241

Prepared by:
Román Lopez
Engineering Technician I

Under the Supervision of:
Chris Mendiara
Associate Principal

**Linscott, Law &
Greenspan, Engineers**
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

EXECUTIVE SUMMARY

The Amanda Lane project (Project) proposes the development of 21 residential dwelling units on 11.2 acres located west of Interstate 15 and west of Felicita Road. The site is in the County of San Diego, but will be annexed to the City of Escondido as part of the entitlement process.

The Project study area includes five (5) intersections and three (3) roadway street segments. The traffic analyses for the Project were conducted in accordance with the *City of Escondido's Traffic Impact Study Guidelines*. The following scenarios are evaluated in this report:

- Existing
- Existing + Project
- Existing + Cumulative Projects
- Existing + Cumulative Projects + Project

The Project traffic generation calculations were conducted using the trip generation rates published in the SANDAG's "*Not so Brief Guide of Vehicular Traffic Generation Rates for San Diego Region*" (April 2002). Based on the lot size of the Project, SANDAG specifies a trip rate of 12.0 trips/ unit. This is a conservative estimate for the Project since the larger lot sizes are a result of the incorporation of open space into the Project, rather than larger homes. The Project is calculated to generate 250 daily trips with 20 trips (6 inbound/14 outbound) in AM peak hour and 25 trips (18 inbound/7 outbound) during PM peak hour.

Project traffic was distributed to the local street system based on the roadway network, employment centers, commercial areas, local schools and general traffic circulation patterns. Existing peak hour traffic volumes, travel patterns and traffic studies for developments in the immediate vicinity of the Project site were utilized to estimate the Project's trip distribution.

Cumulative projects were accounted for based on research conducted by LLG within the City of Escondido and County of San Diego. Based on the research conducted, six (6) cumulative projects were identified for inclusion in the analysis.

Based on the established significance criteria, ***no significant impacts were identified*** and no mitigation measures were proposed.

TABLE OF CONTENTS

SECTION	PAGE
1.0 Introduction.....	1
2.0 Project Description	4
2.1 Project Location	4
2.2 Project Description.....	4
2.3 Project Access.....	4
3.0 Existing Conditions.....	6
3.1 Existing Transportation Conditions.....	6
3.2 Existing Traffic Volumes.....	7
4.0 Analysis Approach and Methodology	10
5.0 Significance Criteria	13
5.1 City of Escondido	13
5.2 Caltrans Facilities.....	13
6.0 Analysis of Existing Conditions.....	15
6.1 Peak Hour Intersection Levels of Service.....	15
6.2 Daily Street Segment Levels of Service	16
7.0 Trip Generation/Distribution/Assignment	17
7.1 Trip Generation.....	17
7.2 Trip Distribution/Assignment.....	17
8.0 Cumulative Projects.....	21
9.0 Analysis of Near-Term Scenarios.....	25
9.1 Existing + Project.....	25
9.1.1 Intersection Analysis.....	25
9.1.2 Segment Operations	25
9.2 Existing + Cumulative Projects	25
9.2.1 Intersection Analysis.....	25
9.2.2 Segment Operations	25
9.3 Existing + Cumulative Projects + Project.....	25
9.3.1 Intersection Analysis.....	25
9.3.2 Segment Operations	26
10.0 Significance of Impacts and Mitigation Measures.....	29

APPENDICES

APPENDIX

- A. Intersection and Segment Manual Count Sheets
- B. Intersection Methodology and Analysis Sheets
- C. City of Escondido and County of San Diego Roadway Classification Tables
- D. Cumulative Project Data

LIST OF FIGURES

SECTION—FIGURE #	FOLLOWING PAGE
Figure 1–1 Vicinity Map	2
Figure 1–2 Project Area Map	3
Figure 2–1 Site Plan	5
Figure 3–1 Existing Conditions Diagram.....	8
Figure 3–2 Existing Traffic Volumes.....	9
Figure 7–1 Project Traffic Distribution.....	18
Figure 7–2 Project Traffic Volumes.....	19
Figure 7–3 Existing + Project Traffic Volumes	20
Figure 8–1 Cumulative Projects Traffic Volumes	22
Figure 8–2 Existing + Cumulative Projects Traffic Volumes.....	23
Figure 8–3 Existing + Cumulative Projects + Project Traffic Volumes	24

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 3–1 Existing Traffic Volumes.....	7
Table 4–1 Traffic Impact Analysis ADT Thresholds for Roadway Segments.....	11
Table 4–2 Traffic Impact Analysis ADT Thresholds for Intersections	11
Table 5–1 City of Escondido Traffic Impact Significance Thresholds	13
Table 5–2 Caltrans Traffic Impact Significance Thresholds	14
Table 6–1 Existing Intersection Operations.....	15
Table 6–2 Existing Street Segment Operations	16
Table 7–1 Project Trip Generation	17
Table 9–1 Near-Term Intersection Operations	27
Table 9–2 Near-Term Street Segment Operations.....	28

TRAFFIC IMPACT ANALYSIS

AMANDA LANE

Escondido, California

February 11, 2014

1.0 INTRODUCTION

Linscott, Law and Greenspan, Engineers (LLG) have prepared the following traffic impact analysis to assess the impacts to the street system as a result of the Amanda Lane project, which proposes the development of 21 residential dwelling units on 11.2 acres. The Project site is located west of Felicita Road on Amanda Lane north of Gamble Lane.

Figure 1-1 shows the Project vicinity and *Figure 1-2* illustrates, in more detail, the site location.

The traffic analysis presented in this report includes the following:

- Project Description
- Existing Conditions
- Analysis Approach and Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Project Trip Generation/Distribution/Assignment
- Cumulative Projects
- Capacity Analysis
- Site Access Discussion
- Significance of Impacts and Mitigation Measures

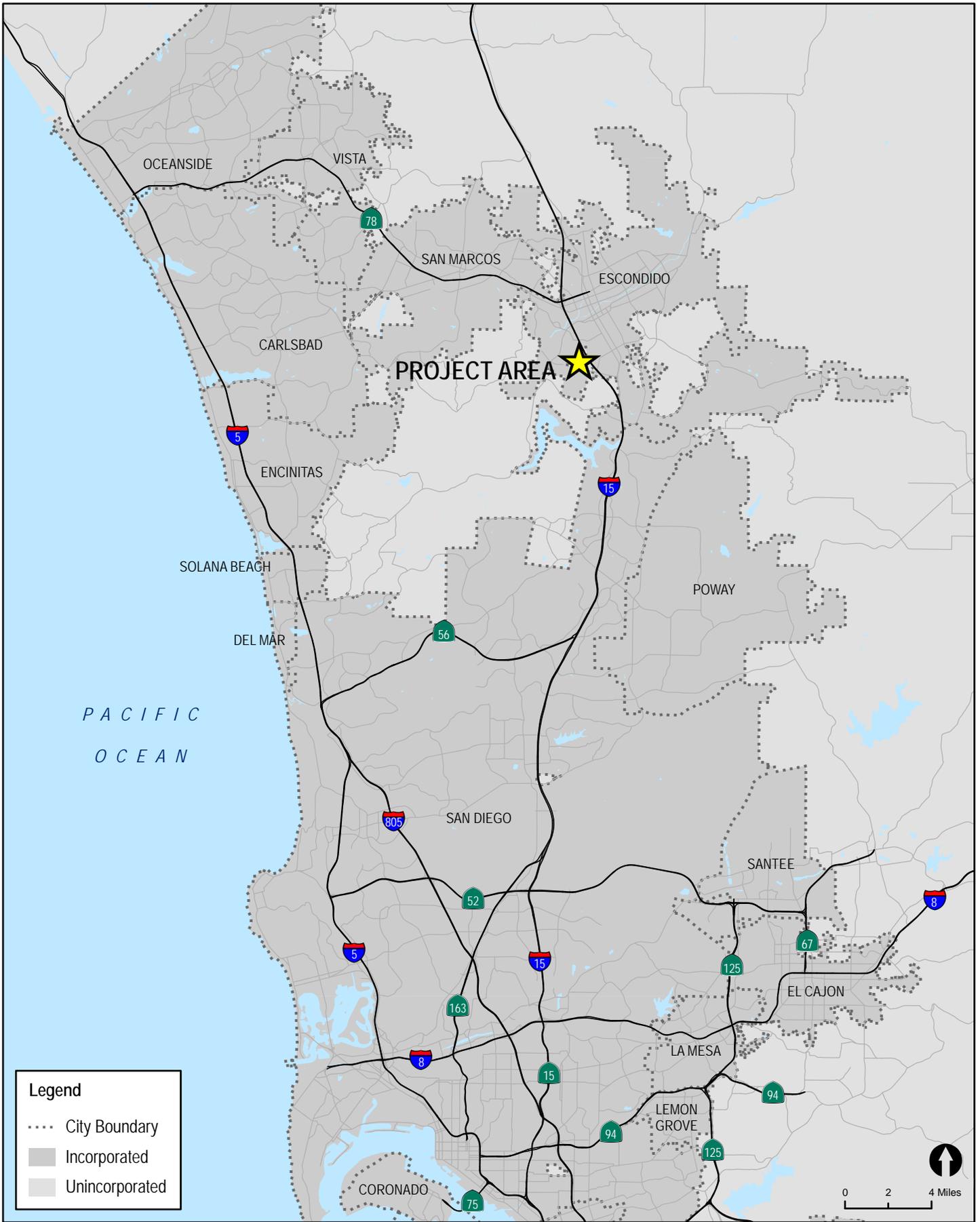
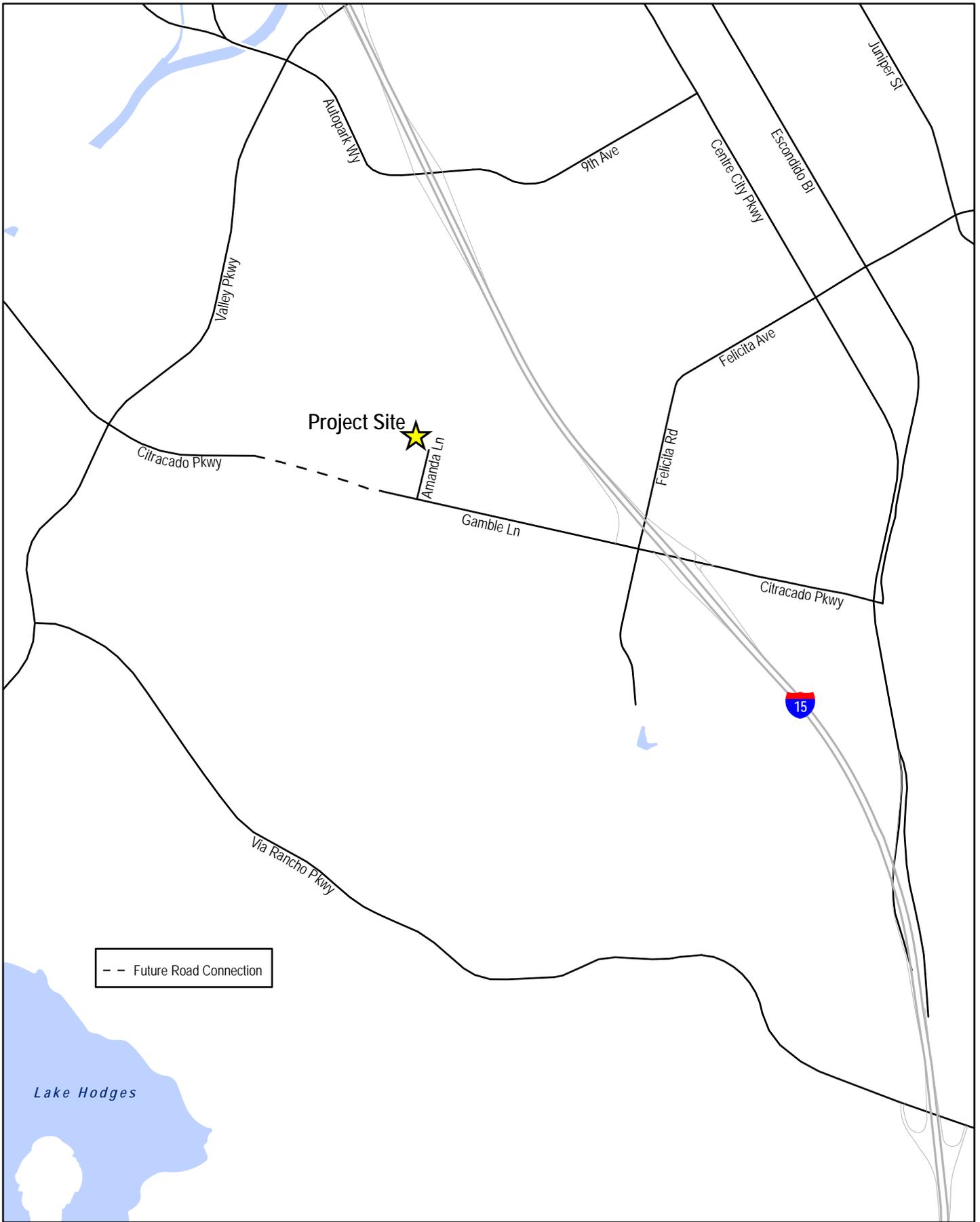


Figure 1-1

Vicinity Map

AMANDA LANE PROJECT



-- Future Road Connection

Lake Hodges

2.0 PROJECT DESCRIPTION

2.1 Project Location

The proposed Amanda Lane Residential Subdivision is located within the unincorporated area of northern San Diego County, California immediately south of the City of Escondido. Upon completion, the Project will be annexed into the City of Escondido. The Project site is within the City's Sphere of Influence (SOI). The 11.2-acre Project site is located on Amanda Lane, immediately north of Gamble Lane.

2.2 Project Description

The Project would construct 21 new single-family detached residences on the Project site. The site is designated for “*Estate II*” residential land uses in the City of Escondido General Plan (2012), which allows for up to two dwelling units per acre (du/ac). The gross density of the Project site would be 1.9 du/ac.

2.3 Project Access

The Project would construct an extension of Amanda Lane and all of the single-family homes would have driveway access directly to Amanda Lane. As a dead-end roadway, access to the site would be provided only from the intersection of Gamble Lane and Amanda Lane, which is analyzed in further detail in this report.

Gamble Lane is proposed to be improved to a Major Road according to the City of Escondido's Mobility Element (2011). The roadway will also be connected to the existing western section of Citracado Parkway, which is currently constructed between Avenida del Diablo and Greenwood Place. According to the Mobility Element, the design features of a Major Road include a four-lane roadway with painted or raised landscaped median. Left turn restrictions will generally be placed at minor unsignalized driveways. Class II bike lanes are part of Major Road design standards, but curbside parking may not be appropriate along most of the street segments of a Major Road. The applicant is coordinating directly with the City regarding improvements to Gamble Lane. These will be included in the project's Tentative Map.

Figure 2-1 shows the Project's Site Plan.



Figure 2-1

Site Plan

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the Project requires an understanding of the existing transportation system within the Project area. *Figure 3-1* shows an existing conditions diagram, including signalized/unsignalized intersections and lane configurations.

The study area was determined in accordance with the City of Escondido's published Traffic Impact Analysis Requirement Guidelines (2014). Further details on the City's guidelines for developing the study area can be found in Section 4.0. The study area includes the following five (5) existing public intersections and three (3) street segments.

Intersections:

1. Gamble Lane / Amanda Lane
2. Gamble Lane / Bernardo Avenue
3. Gamble Lane / I-15 SB Off-Ramp
4. Felicita Road / Citracado Parkway
5. Citracado Parkway / I-15 NB Ramps

Segments:

1. Gamble Lane: Amanda Lane to Bernardo Avenue
2. Gamble Lane: Bernardo Avenue to I-15 SB Off-Ramp
3. Citracado Parkway: East of I-15 NB Ramps

3.1 Existing Transportation Conditions

The following is a brief description of the streets in the Project area.

Interstate 15 (I-15) is a north/south facility that extends as a freeway from the San Diego area north to the California-Nevada border and beyond. It provides four-lanes in both north/south direction in the Project area. The posted speed limit on Interstate 15 is 65 mph in the Project area.

Felicita Road is constructed as a two-lane undivided roadway within the study area. According to the City of Escondido General Plan Circulation Element, Felicita Road is classified as a Collector Road north of Hamilton Lane before reclassifying to a Local Collector south of Hamilton Lane. Felicita Road south of Hamilton Lane is currently built to County of San Diego standards, and is approximately 36 feet wide curb-to-curb with 12-foot lanes. Bike lanes are provided and parking is restricted along both sides of the roadway. Sidewalks, curbs and gutters are not provided and the posted speed limit is 45 mph.

Citracado Parkway is constructed as a four lane divided roadway from Felicita Road to I-15 NB Ramps and transitions to a two-lane roadway east of I-15. According to the City of Escondido General Plan Circulation Element, Citracado Parkway is classified as a Major Road from Felicita Road to I-15 NB Ramps and as a Collector roadway east of I-15. The posted speed is 40 mph on the

four-lane portion of Citracado Parkway and 25 mph on the two-lane portion. No on-street parking or bike lanes are provided.

Gamble Lane is constructed as a two-lane divided roadway from Amanda Lane to Bernardo Avenue. East of Bernardo Avenue Gamble Lane widens to a three-lane undivided roadway with two eastbound lanes and one westbound lane. Gamble Lane is planned to connect to Citracado Parkway west of Amanda Lane with buildout of the City and County’s circulation elements. According to the City of Escondido General Plan Circulation Element, Gamble Lane is classified as a Major Road, and the County of San Diego’s Mobility Element has it classified as 4.1A Major Road. A bicycle lane is provided in the eastbound direction east of Bernardo Avenue. The posted speed limit is 25 mph.

Bernardo Avenue is classified in the City of Escondido General Plan Circulation Element as a Local Collector. In the Project vicinity it is currently constructed as a two-lane undivided roadway with a posted speed limit of 45 mph. No curbside parking, bike lanes, or sidewalks are provided.

Amanda Lane is an unclassified residential road. It is currently constructed as a two-lane undivided roadway with no sidewalks or curbside parking. The existing intersection of Amanda Lane and Gamble Lane is uncontrolled.

3.2 Existing Traffic Volumes

Table 3–1 is a summary of the most recent available average daily traffic volumes (ADTs) from LLG counts commissioned in March and June 2013.

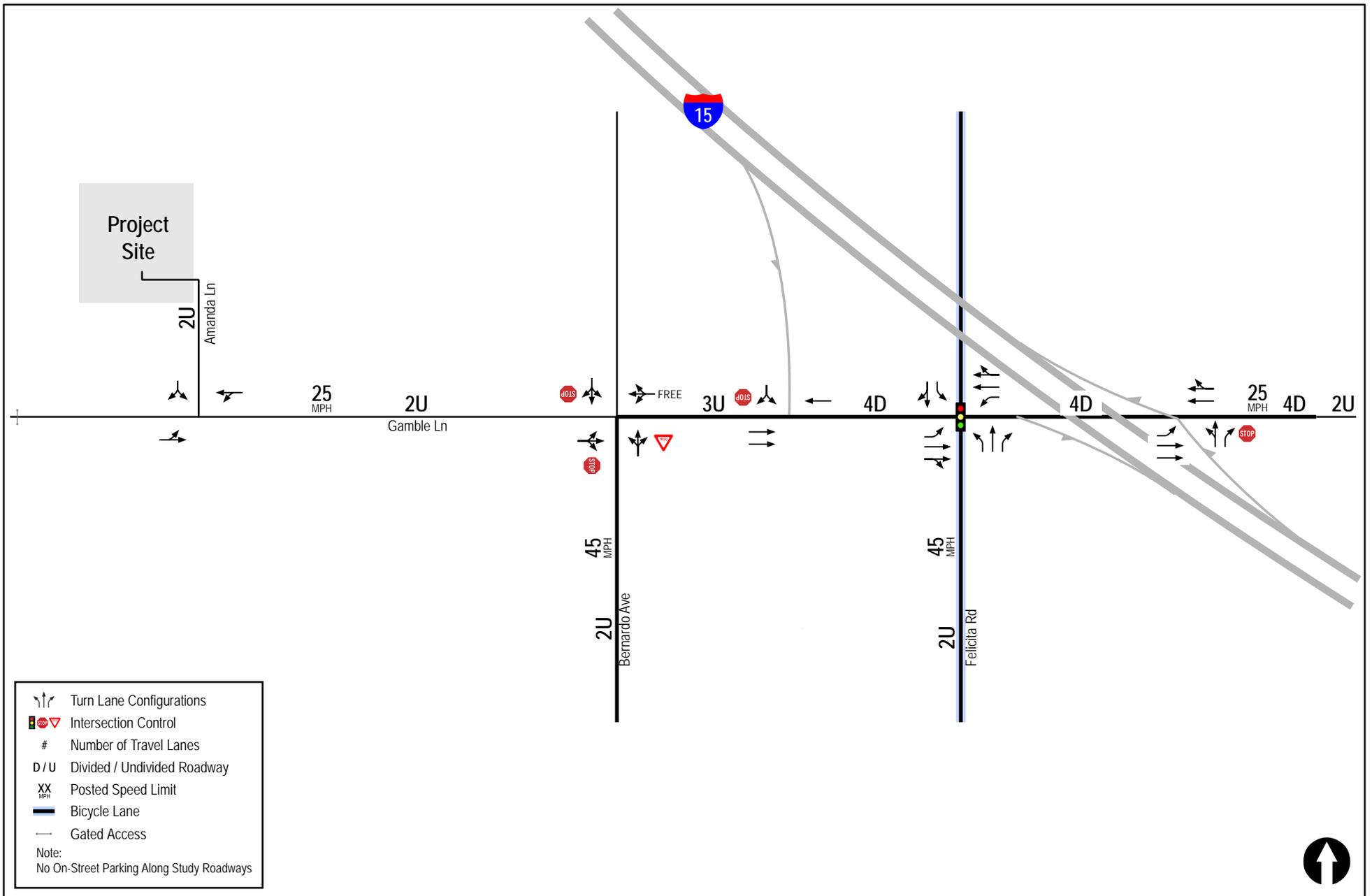
Figure 3–2 shows the Existing Traffic Volumes. **Appendix A** contains the manual count sheets.

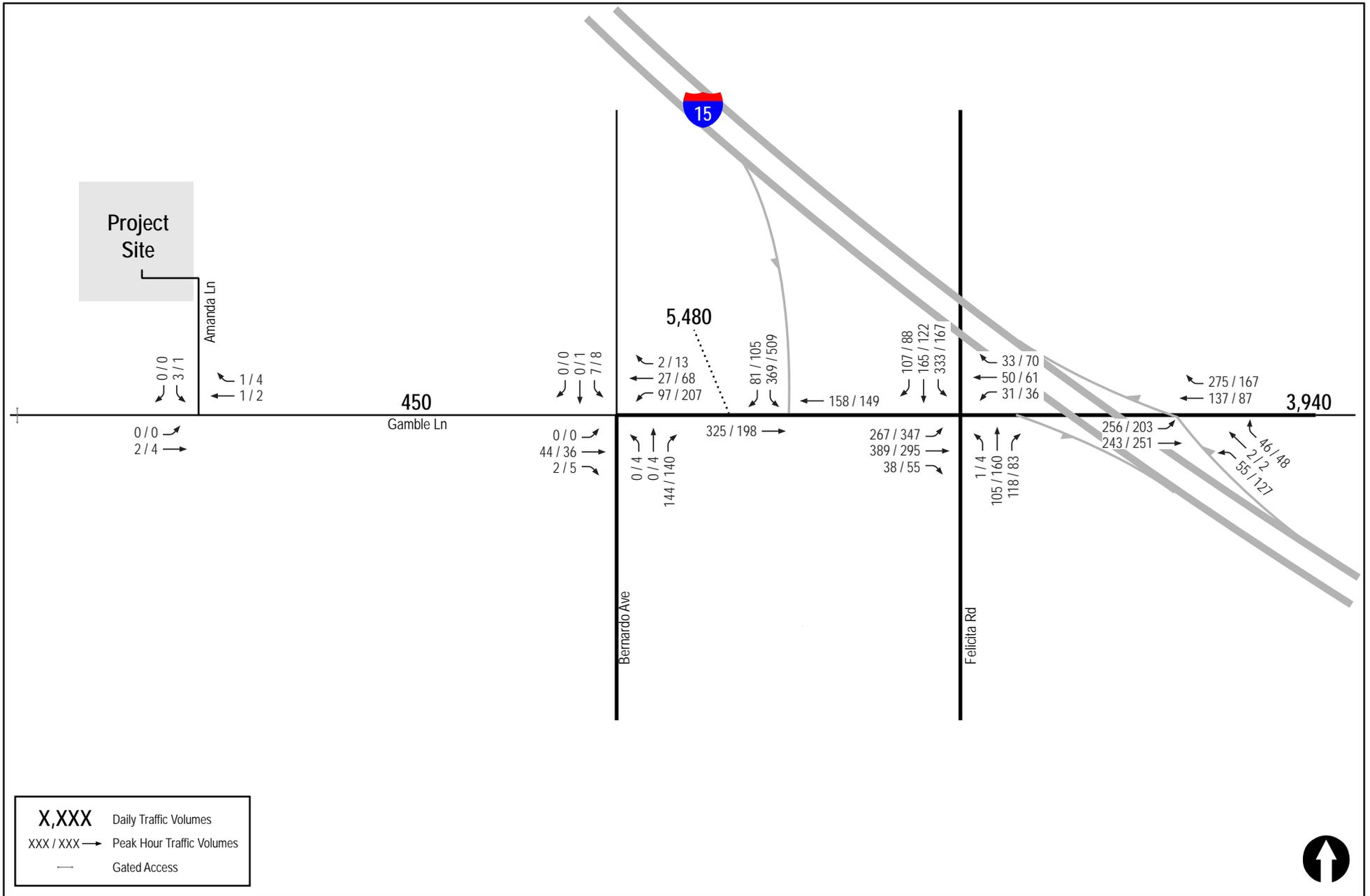
TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT ^a	Date
Gamble Lane		
Amanda Lane to Bernardo Avenue	450	June 2013
Bernardo Avenue to I-15 SB Off-Ramp	5,480	June 2013
Citracado Parkway		
East of I-15 NB Ramps	3,940	March 2013

Footnotes:

- a. Average Daily Traffic Volume counts conducted in March and June, 2013 by LLG Engineers.





4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized intersections, unsignalized intersections and roadway segments.

The Project will be annexed into the City of Escondido. Project traffic primarily affects roadways and intersections located within the City of Escondido's SOI. As such, the City of Escondido's recently published Traffic Impact Analysis Guidelines provide the following direction on report approach and methodology:

1. The traffic study should include a SANDAG prepared Select Zone Assignment for the Project to determine the Project traffic distribution.
2. The traffic study should utilize the Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002) published by SANDAG, to determine the Project traffic volume.
3. Traffic should utilize the following scenarios to determine Project traffic impacts at intersections and along roadway segments.
 - a. Existing Condition (based on new traffic counts)
 - b. Existing + Project Traffic Condition
 - c. Existing + Cumulative Projects Traffic Condition
 - d. Existing + Cumulative Projects + Project Traffic Condition
 - e. Year 2035 Traffic Condition
4. Highway Capacity Manual (Year 2010) should be utilized to determine level of service for intersections.
5. The study area should include at least all site access points and major intersections (signalized and un-signalized) adjacent to the site. The tables below contain the trigger-points to identify if a roadway segment or intersection should be included in the Traffic Impact Analysis. **Table 4-1** below contains the trigger-points for roadway segments within the City of Escondido for different street classifications based on ADT added to the segment. **Table 4-2** below contains the trigger-points for intersections based on peak hour volumes.

TABLE 4-1
TRAFFIC IMPACT ANALYSIS ADT THRESHOLDS FOR ROADWAY SEGMENTS

Street Classification	Lanes	Cross Sections (ft.)	TIA Trigger-Points (ADT generation)
Prime Arterial	(8 lanes)	116/136 (NP)	900
	(6 lanes)	106/126 (NP)	800
Major Road	(6 lanes)	90/110 (NP)	700
	(4 lanes)	82/102 (NP)	500
Collector	(4 lanes)	64/84 (NP)	500
	(4 lanes)	(WP)	250
Local Collector and all other	(2 lanes)	42/66 (NP)	200
		(WP)	

TABLE 4-2
TRAFFIC IMPACT ANALYSIS ADT THRESHOLDS FOR INTERSECTIONS

Intersection Classification (Minor leg of the intersection)	TIA Trigger-Points (AM or PM peak hour trips added to any leg)
Prime Arterial	50
Major Road	40
Collector	30
Local Collector	20

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 18 of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 8) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix B**.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapters 19 and 20 of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 8) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix B**.

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of Escondido *Roadway Classification, Level of Service, and ADT Table*, with the exception of Gamble Lane from Amanda Lane to Bernardo Avenue, for which San Diego County standards were used. These tables provide segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

It should be noted that although Gamble Lane is classified in the City of Escondido Circulation Element and County of San Diego Mobility Element as a Major Road, based on existing conditions including pavement widths, posted speed, and other characteristics of the roadway and adjacent land uses, more restrictive classifications with lower capacities were chosen. Gamble Lane from Amanda Lane to Bernardo Avenue was analyzed using the County of San Diego's Rural Residential Collector classification. Gamble Lane from Bernardo Avenue to I-15 SB Off-Ramp was analyzed as a 2-Lane Collector using City of Escondido standards.

Both the City of Escondido *Roadway Classification, Level of Service, and ADT Table* and County of San Diego *Road Classification, and Public Roads Standards* tables are attached in **Appendix C**.

5.0 SIGNIFICANCE CRITERIA

The Project study area includes locations that lie both within the City of Escondido and State of California (Caltrans) jurisdictions. The following is a summary of the significance criteria from each jurisdiction that was utilized in this study.

5.1 City of Escondido

The City of Escondido Engineering Staff provided the following Significance Criteria:

In accordance with “SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region”, the following thresholds shall be used to identify if a project is of significant traffic impact under any scenario. Based on SANTEC/ITE guidelines, if now or in the future, the project’s traffic impact causes the values in **Table 5-1** below to be exceeded in a roadway segment or an intersection that is operating at LOS D or worse, it is determined to be a significant impact and the project shall identify mitigation measures.

TABLE 5-1
CITY OF ESCONDIDO TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service With Project	Allowable Change due to Project Impact		
	Roadway Segments		Intersections
	V/C	Speed Reduction (mph)	Delay (sec.)
D, E, or F	0.02	1	2

5.2 Caltrans Facilities

A project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds shown in **Table 5-2** below for freeway segments, roadway segments, intersections, and ramp meter facilities are based on published San Diego Traffic Engineers’ Council (SANTEC) guidelines. If the Project exceeds the thresholds in **Table 5-2**, then the Project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

TABLE 5-2
CALTRANS TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service with Project	Allowable Increase Due to Project Impacts ^b					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
D, E & F ^a (or ramp meter delays above 15 minutes)	0.01	1	0.02	1	2	2 ^c

Footnotes:

- a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.
- b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.
- c. The impact is only considered significant if the total delay exceeds 15 minutes.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

Table 6-1 summarizes the existing peak hour intersection operations. As shown, all the study area intersections are calculated to currently operate at acceptable service levels of LOS C or better during both the AM and PM peak hours.

TABLE 6-1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay ^a	LOS ^b
1. Gamble Lane / Amanda Lane	OWSC ^c	AM	8.5	A
		PM	8.6	A
2. Gamble Lane / Bernardo Avenue	TWSC ^d	AM	10.1	B
		PM	13.0	B
3. Gamble Lane / I-15 SB Off-Ramp ^e	OWSC	AM	18.0	C
		PM	23.0	C
4. Felicita Road / Citracado Parkway	Signal	AM	29.5	C
		PM	26.1	C
5. Citracado Parkway / I-15 NB Ramps ^e	OWSC	AM	20.3	C
		PM	24.1	C

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. One-Way Stop Controlled intersection. Minor street left-turn delay is reported. A de facto stop-control is assumed on Amanda Lane for the purposes of analysis.
- d. TWSC – Two-Way Stop Controlled intersection. Minor street left-turn delay is reported.
- e. Caltrans-controlled intersection location.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

6.2 Daily Street Segment Levels of Service

Table 6-2 summarizes the existing segment operations along the key study area roadways. As shown, all roadway segments are calculated to currently operate at LOS B or better.

**TABLE 6-2
EXISTING STREET SEGMENT OPERATIONS**

Street Segment	Classification	Capacity (LOS E) ^a	ADT ^b	LOS ^c	V/C ^d
Gamble Lane					
Amanda Lane to Bernardo Avenue ^e	Rural Residential Collector	4,500	450	>C	N/A
Bernardo Avenue to I-15 SB Off-Ramp	2-Lane Collector	15,000	5,480	B	0.365
Citracado Parkway					
East of I-15 NB Ramps	2-Lane Collector	15,000	3,940	A	0.263

Footnotes:

- a. Capacities based on City of Escondido and County of San Diego Roadway Classification Table.
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. Volume to Capacity.
- e. Based on the decision to classify this segment as a Rural Residential Collector under County standards, the information presented is slightly different than for other segments. Levels of service are not normally applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Therefore the capacity stated is the LOS C capacity and it is noted only that the existing volume is better than this threshold.

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

The following is a discussion of the Project trip generation calculations and the Project traffic distribution and assignment through the local network.

7.1 Trip Generation

The Project proposes to develop 21 single-family estate style homes on an 11.2-acre property.

The Project traffic generation calculations were conducted using the trip generation rates published in the SANDAG's "Not so Brief Guide of Vehicular Traffic Generation Rates for San Diego Region" (April 2002). Based on the type and density of homes proposed by the Project, SANDAG specifies a trip rate of 12.0/ unit.

Table 7-1 shows a summary of the Project traffic generation. As tabulated the Project is calculated to generate 250 daily trips with 20 trips (6 inbound/14 outbound) in AM peak hour and 25 trips (18 inbound/7 outbound) during PM peak hour.

TABLE 7-1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour				PM Peak Hour					
		Rate ^a	Volume	% of ADT	In:Out		Volume		% of ADT	In:Out		Volume	
					Split	In	Out	Split		In	Out		
Residential - Estate	21 DU	12.0 / DU	250	8%	30:70	6	14	10%	70:30	18	7		

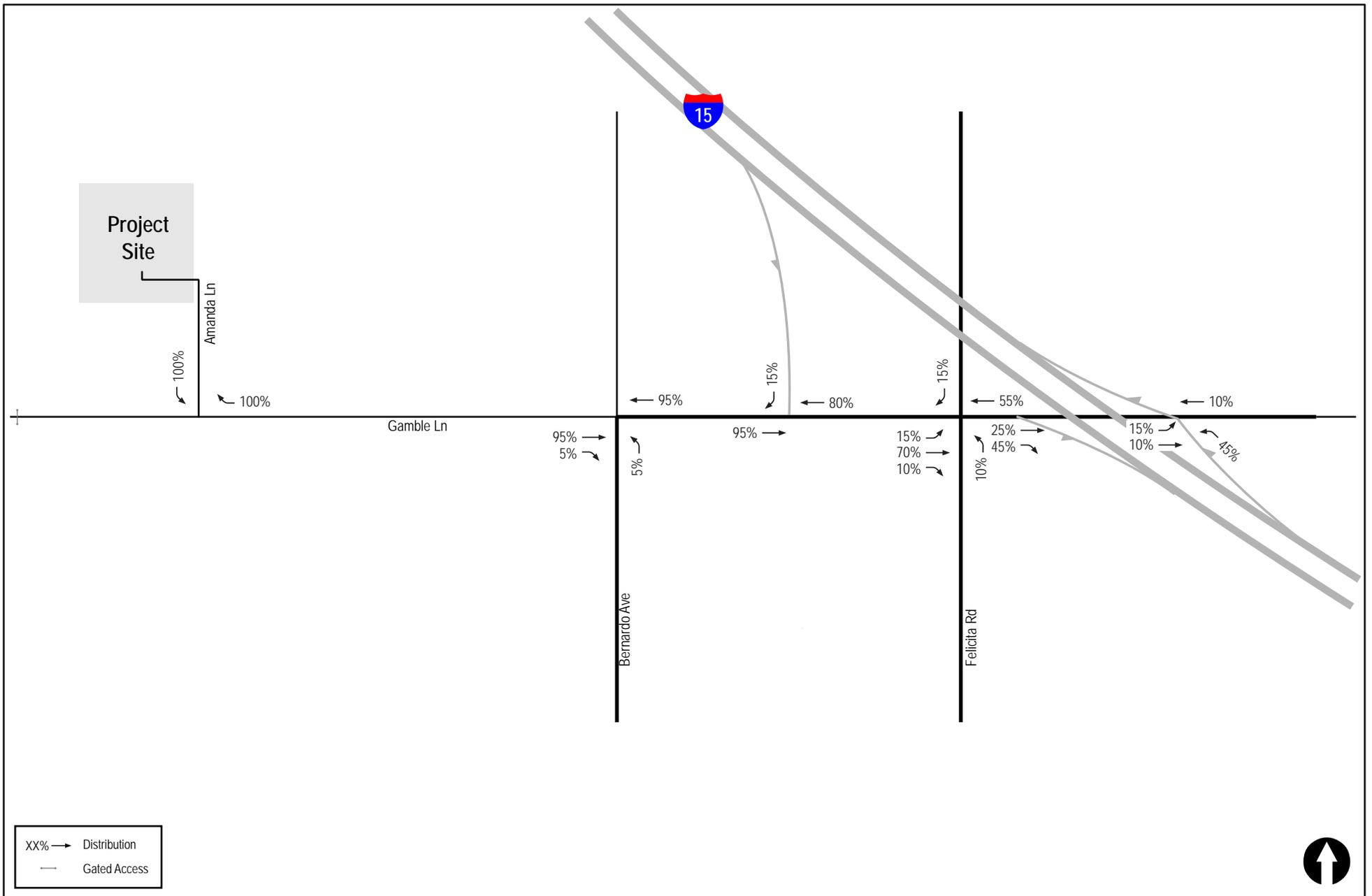
Footnotes:

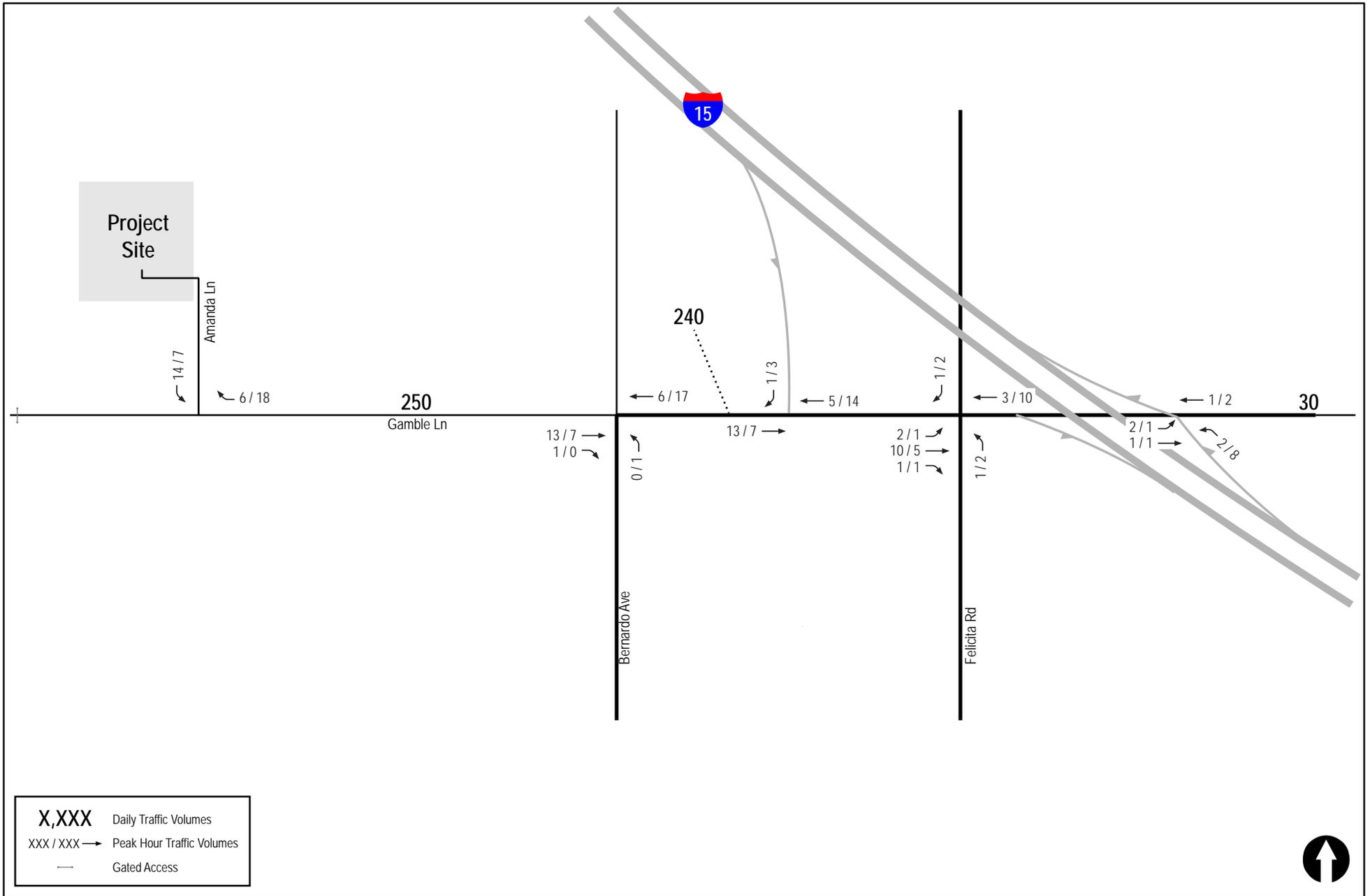
- a. Rate is based on SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.

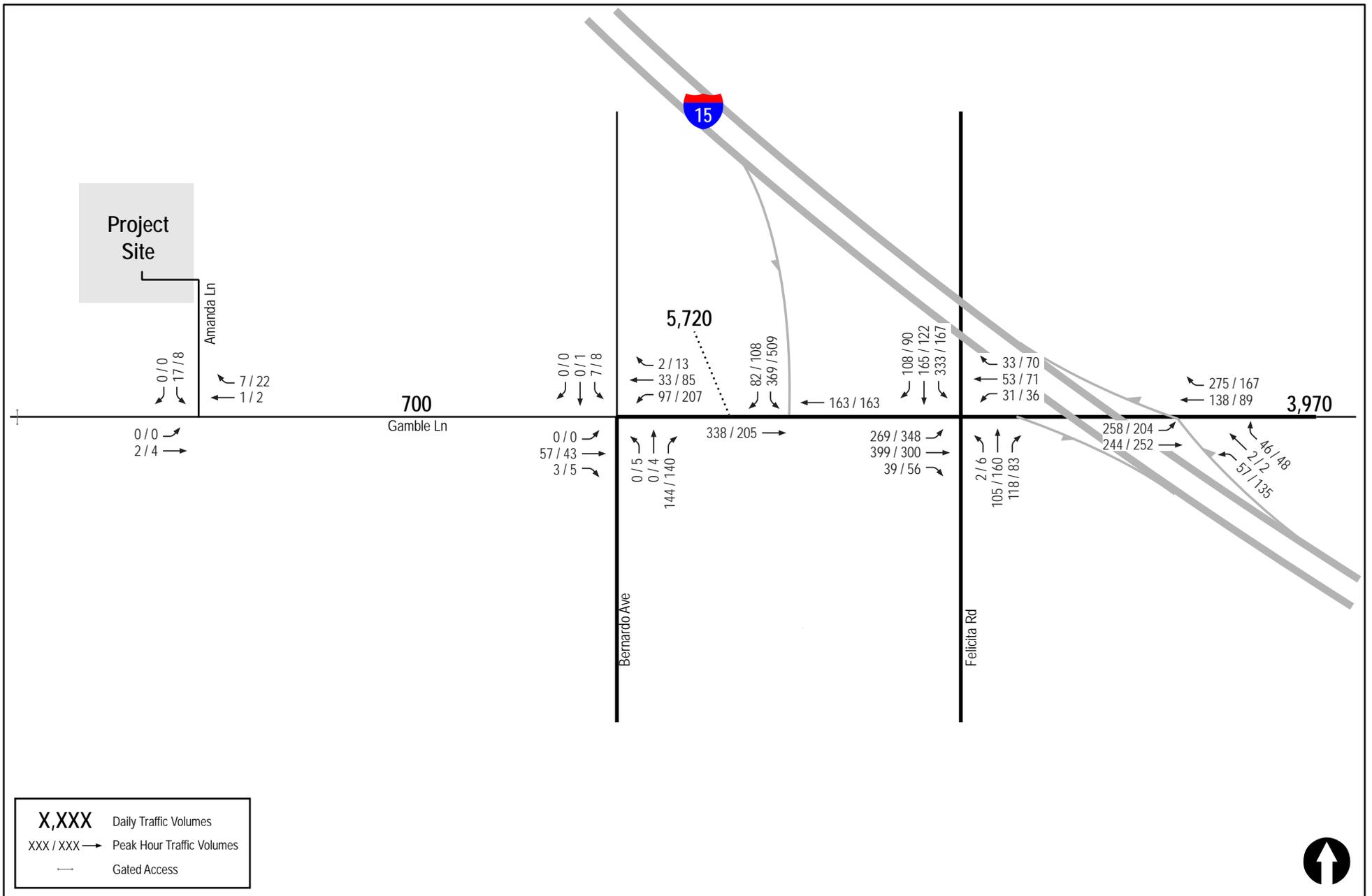
7.2 Trip Distribution/Assignment

The Project traffic was distributed to the local street system based on the roadway network, the location of employment centers, commercial areas, local schools, and existing peak hour traffic volumes.

Figure 7-1 shows the Project trip distribution percentages. **Figure 7-2** shows the AM/PM peak hour Project traffic volumes. **Figure 7-3** shows Existing + Project traffic volumes.







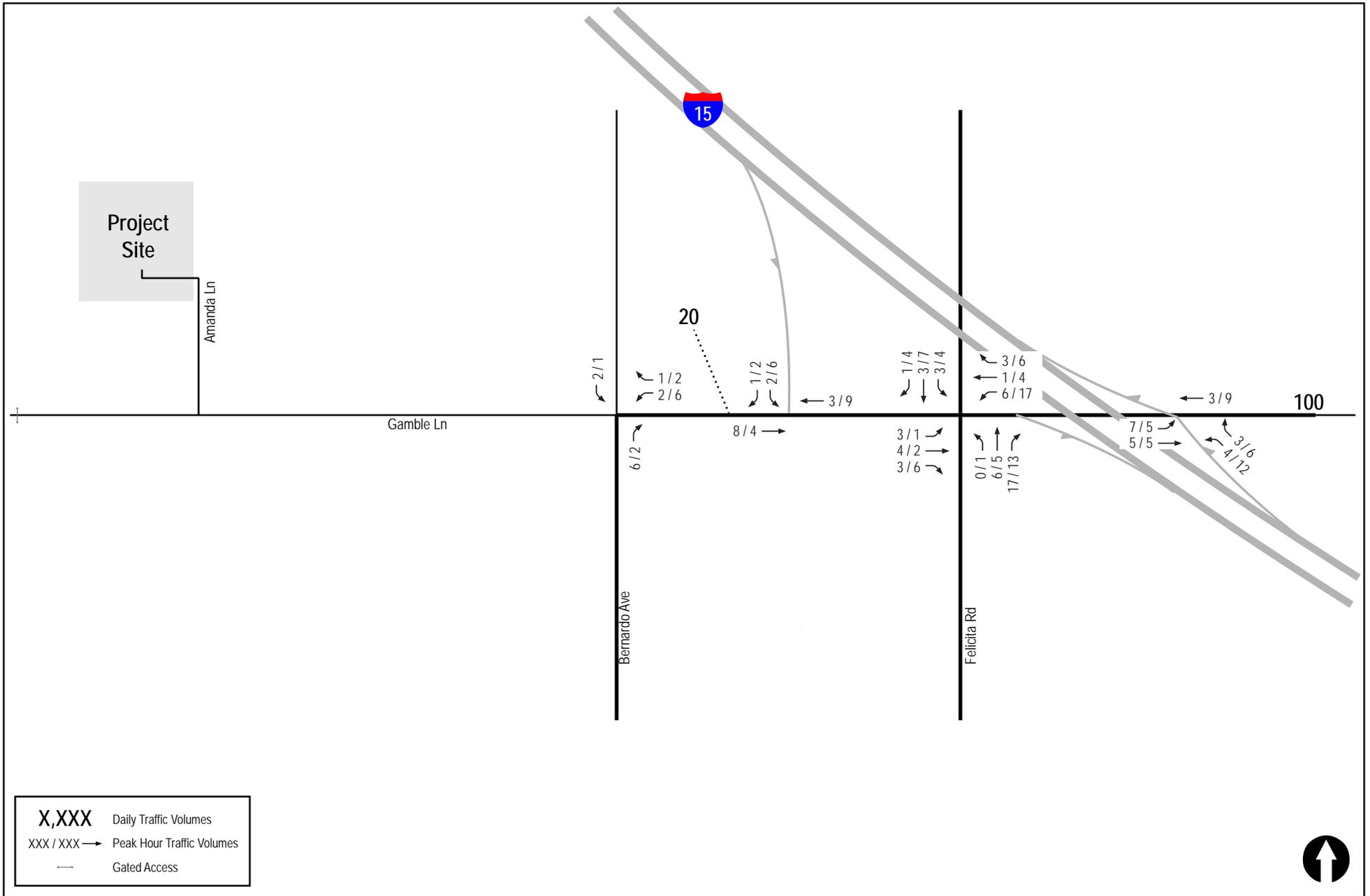
8.0 CUMULATIVE PROJECTS

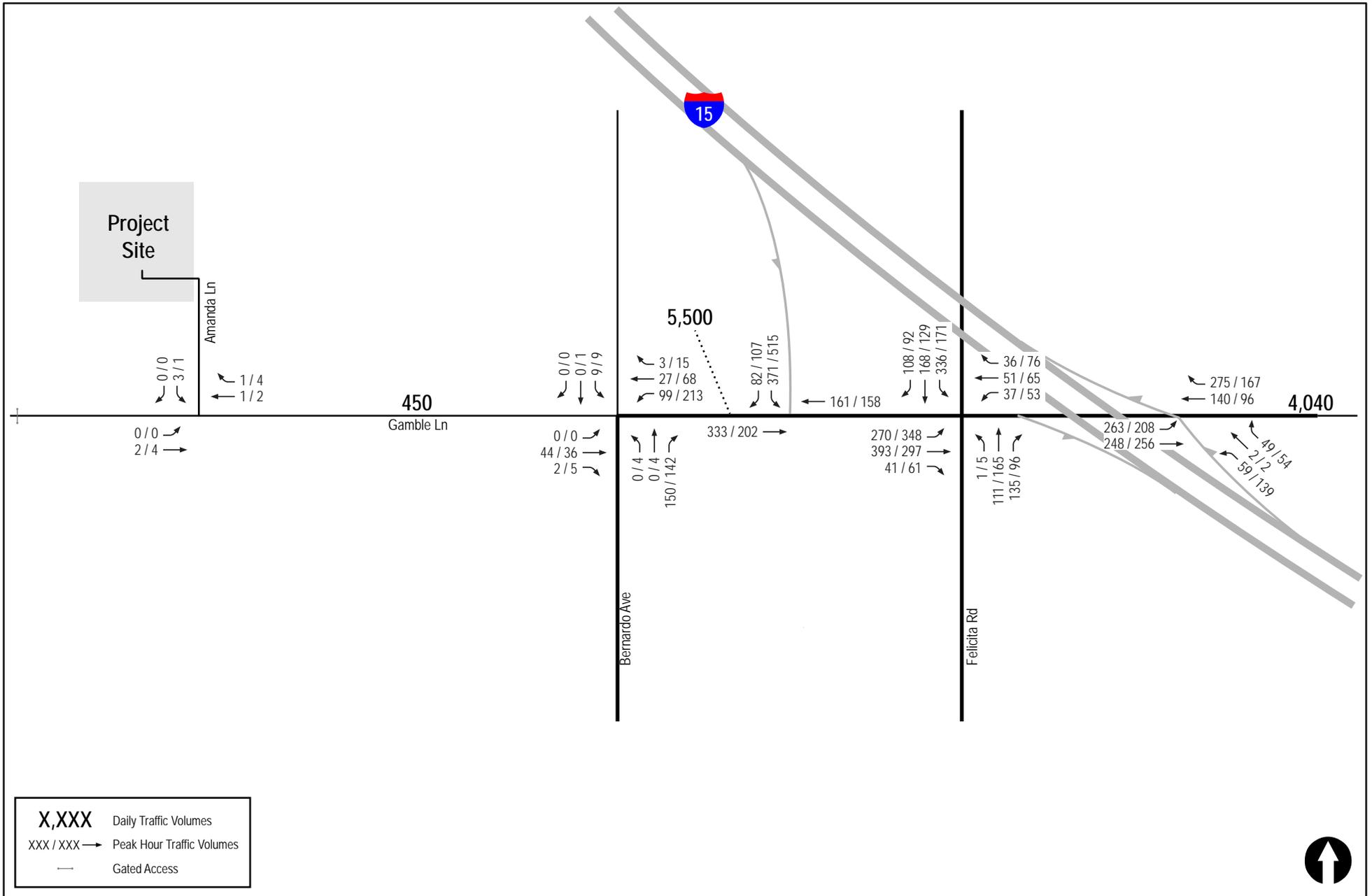
Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. LLG researched potential cumulative projects within the City of Escondido and County of San Diego to identify if any potential discretionary projects could be included for analysis. Based on the research conducted, six (6) cumulative projects were included in this study.

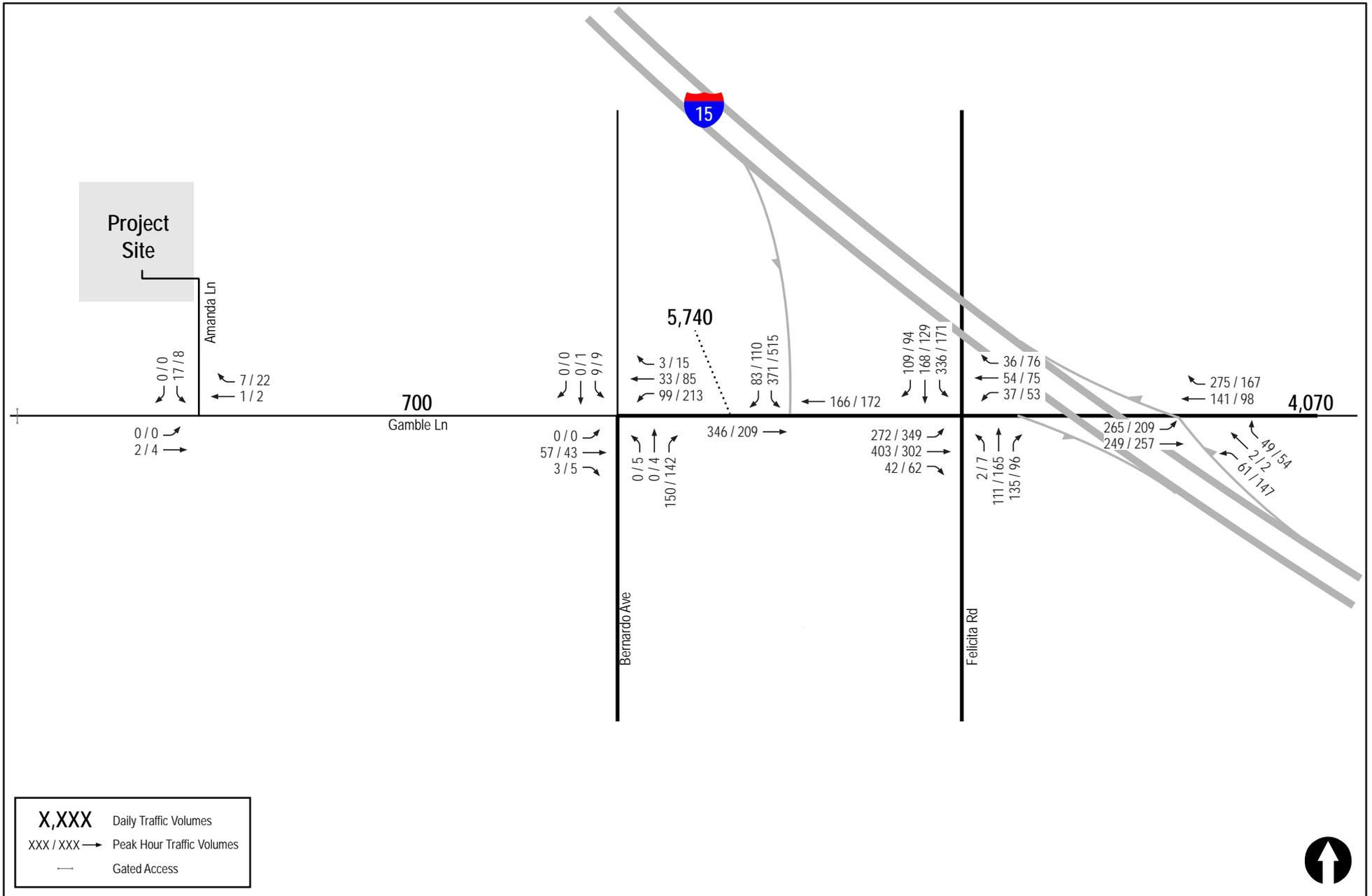
Due to phased construction over a period of 39 months beginning in late 2014, only a portion of the project trips from the proposed Oak Creek residential development were included in the cumulative scenarios.

Figure 8-1 shows the total cumulative project traffic volumes. *Figure 8-2* shows the existing + cumulative projects traffic volumes. *Figure 8-3* shows the existing + project + cumulative projects traffic volumes.

Appendix D contains the cumulative project information.







9.0 ANALYSIS OF NEAR-TERM SCENARIOS

The following is a summary of the operational analyses for the various street-system components for the near-term traffic scenarios.

9.1 Existing + Project

9.1.1 Intersection Analysis

Table 9-1 summarizes the peak hour intersection operations with the addition of Project traffic. *Table 9-1* shows that all the study area intersections are calculated to continue to operate at LOS C or better during both the AM and PM peak hours with the exception of the I-15 Northbound Ramps. The minor street movements (Left-Turns) at these ramps are calculated to operate at LOS D during the PM peak hour.

Although the intersection of Citracado Parkway / I-15 Northbound operates at LOS D in the Existing + Project scenario, the Project's contribution to the calculated delay is less than the allowable increase of 2.0 seconds as shown in *Table 5-2*. Therefore, **no significant impact is determined**.

9.1.2 Segment Operations

Table 9-2 summarizes the roadway segment operations with the addition of Project traffic. As seen in *Table 9-2*, the study area segments are calculated to continue to operate at LOS B or better on a daily basis.

9.2 Existing + Cumulative Projects

9.2.1 Intersection Analysis

Table 9-1 summarizes the peak hour intersection operations with the addition of cumulative project traffic. *Table 9-1* shows that all the study area intersections are calculated to continue to operate at LOS C or better during both the AM and PM peak hours with the exception of the I-15 Northbound Ramps. The minor street movements (Left-Turns) at these ramps are calculated to operate at LOS D during the PM peak hour.

9.2.2 Segment Operations

Table 9-2 summarizes the roadway segment operations with the addition of cumulative project traffic. As seen in *Table 9-2*, the study area segments are calculated to continue to operate at LOS B or better on a daily basis.

9.3 Existing + Cumulative Projects + Project

9.3.1 Intersection Analysis

Table 9-1 summarizes the peak hour intersection operations for Existing + Cumulative Projects + Project conditions. *Table 9-1* shows that all the study area intersections are calculated to continue to operate at LOS C or better during both the AM and PM peak hours with the exception of the I-15 Southbound and Northbound Ramps. The minor street movements (Left-Turns) at these ramps are calculated to operate at LOS D during the PM peak hour.

Although the intersections of Gamble Lane / I-15 Southbound and Citracado Parkway / I-15 NB operate at LOS D in the Existing + Cumulative Projects + Project scenario, the Project's contribution

to the calculated delay is less than the allowable increase of 2.0 seconds as shown in *Table 5-2*. Therefore, **no significant impact is determined.**

9.3.2 *Segment Operations*

Table 9-2 summarizes the roadway segment operations for the Existing + Cumulative Projects + Project conditions. As seen in *Table 9-2*, the study area segments are calculated to continue to operate at LOS B or better on a daily basis.

**TABLE 9-1
NEAR-TERM INTERSECTION OPERATIONS**

Intersection	Control Type	Peak Hour	Existing		Existing + Project			Existing + Cumulative Projects		Existing + Cumulative Projects + Project			Significant Impact?
			Delay ^a	LOS ^b	Delay	LOS	Δ ^c	Delay	LOS	Delay	LOS	Δ	
1. Gamble Lane / Amanda Lane	OWSC ^d	AM	8.5	A	8.6	A	0.1	8.5	A	8.6	A	0.1	No
		PM	8.6	A	8.6	A	0.0	8.6	A	8.6	A	0.0	No
2. Gamble Lane / Bernardo Avenue	TWSC ^e	AM	10.1	B	10.2	B	0.1	10.2	B	10.2	B	0.0	No
		PM	13.0	B	13.3	B	0.3	13.2	B	13.5	B	0.3	No
3. Gamble Lane / I-15 SB Off-Ramp ^f	OWSC	AM	18.0	C	18.6	C	0.6	18.4	C	19.0	C	0.6	No
		PM	23.0	C	24.6	C	1.6	24.8	C	26.4	D	1.6	No
4. Gamble Lane / Felicita Road	Signal	AM	29.5	C	29.8	C	0.3	30.0	C	30.3	C	0.3	No
		PM	26.1	C	26.2	C	0.1	26.9	C	27.0	C	0.1	No
5. Citracado Parkway / I-15 NB Ramps ^f	OWSC	AM	20.3	C	20.8	C	0.5	21.6	C	22.4	C	0.8	No
		PM	24.1	C	25.4	D	1.3	27.4	D	28.5	D	1.1	No

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase in delay due to project.
- d. OWSC – One-Way Stop Controlled intersection. Minor street left turn delay is reported. A de facto stop control is assumed on Amanda Lane for the purposes of analysis.
- e. TWSC – Two-Way Stop Controlled intersection. Minor street left-turn delay is reported.
- f. Caltrans-controlled intersection location.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

**TABLE 9-2
NEAR-TERM STREET SEGMENT OPERATIONS**

Street Segment	Capacity (LOS E) ^a	Existing			Existing + Project				Existing + Cumulative Projects			Existing + Cumulative Projects + Project				Sig Impact?
		ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C	Δ ^e	ADT	LOS	V/C	ADT	LOS	V/C	Δ ^e	
Gamble Lane																
Amanda Lane to Bernardo Ave ^f	4,500	450	>C	N/A	700	>C	N/A	N/A	450	>C	N/A	700	>C	N/A	N/A	No
Bernardo Ave to I-15 SB Off-Ramp	15,000	5,480	B	0.365	5,720	B	0.381	0.016	5,500	B	0.367	5,740	B	0.383	0.016	No
Citracado Parkway																
East of I-15 NB Ramps	15,000	3,940	A	0.263	3,970	A	0.265	0.002	3,960	A	0.264	3,990	A	0.266	0.002	No

Footnotes:

- a. Capacities based on the City of Escondido and County of San Diego Roadway Classification tables (See *Appendix C*).
- b. Average Daily Traffic
- c. Level of Service
- d. Volume to Capacity ratio
- e. Δ denotes a project-induced increase in the volume to capacity ratio.
- f. Based on the decision to classify this segment as a Rural Residential Collector under County standards, the information presented is slightly different than for other segments. Levels of service are not normally applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Therefore the capacity stated is the LOS C capacity and it is noted only that the existing volume is better than this threshold. V/C ratio does not apply to analysis of this segment.

10.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

The traffic impacts of the proposed 250-ADT Amanda Lane project do not exceed the significance thresholds published by the City of Escondido and Caltrans.

Therefore, no significant impacts are identified, and no mitigation measures are required.

However, it is recommended that a stop sign be installed on Amanda Lane at Gamble Lane.

End of Report