IS/MND Appendix G

Noise Assessment Study

HELIX Environmental Planning

Camino Largo Residential Project

Noise Assessment Study

December 2021 | 02951.00013.001

Submitted to:

City of Vista
Community Development Department
200 Civic Center Drive
Vista, CA 92084-6275

Prepared for:

California West Communities
5927 Priestly Drive, Suite 110
Carlsbad, CA 92008

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

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ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Vista
CNEL	Community Noise Equivalent Level
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
kHz	kilohertz
L_{DN}	Day-Night level
L_{EQ}	equivalent sound level
LLG	Linscott, Law and Greenspan, Engineers
L_{MAX}	maximum noise level
mPa	micro-Pascals
mph	miles per hour
NSLU	noise-sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
STC	Sound Transmission Class
S_{WL}	sound power level
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation

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EXECUTIVE SUMMARY

This report presents an assessment of potential noise impacts associated with the proposed Camino Largo Residential Project (project). The project is located on a 9.3-acre project site in the City of Vista. The project site is located at the northeast corner of North Santa Fe Avenue and Camino Largo. The project involves removal of structures associated with an existing nursery and the construction of 46 two-story single-family residential units.

Anticipated construction activities would generate temporary elevated noise levels for nearby residences to the west and south. Although the use of construction equipment is not anticipated to exceed City noise ordinance limits, construction noise may exceed ambient conditions by 10 dBA. Mitigation measure NOI-1 would reduce noise impacts to less than significant levels. Construction would not generate substantial vibration.

Operational noise impacts would be less than significant. The project's heating, ventilation, and air conditioning (HVAC) systems would not exceed allowable City limits within the noise ordinance at the nearest property lines. The project would add traffic to nearby roadways, but transportation noise impacts to off-site land uses would be less than significant.

The backyard exterior use areas of the proposed residences at Lots 1 and 2 would be exposed to noise from vehicular traffic along North Santa Fe Avenue that would exceed the applicable 65 Community Noise Equivalent Level (CNEL) limit set forth in the City of Vista's General Plan Noise Element. Mitigation measure NOI-2 would be required to construct barriers and reduce noise levels to the 65 CNEL exterior limit at these locations. Through incorporation of mitigation measure NOI-3, which relates to exterior wall and window construction, interior noise levels at Lots 1 and 2 would not exceed the applicable interior 45 CNEL limit for residential uses.

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential noise and vibration impacts associated with the proposed Camino Largo Residential Project (project). The analysis includes a description of existing conditions in the project vicinity and an assessment of potential impacts associated with project implementation. Analysis within this report addresses the relevant issues listed in the Noise and Land Use sections of Appendix G of the California Environmental Quality Act (CEQA) Guidelines.

1.2 PROJECT LOCATION

The 9.3-acre project site (Assessor's Parcel Number [APN] 159-240-07) is located northeast of the intersection of North Santa Fe Avenue and Camino Largo in the City of Vista (City), south of the City's boundary with the County of San Diego. Guajome Adobe Park is located to the west and rural single-family residences and undeveloped land are to the south and east. See Figure 1, *Regional Location*, and Figure 2, *Project Vicinity*.

The existing site contains remnants of the former nursery, including hoop frames of the former greenhouses, palm trees in box planters, and piles of green waste. There is a structure that is associated with the former nursery operations located in the south-central portion of the site and trucks and machinery scattered throughout the site.

1.3 PROJECT DESCRIPTION

The project would construct 46 two-story single-family residential units. Access would be provided by four private drives extending north from Camino Largo. Resident parking would be provided via two-car garages and individual driveways, with additional parking provided along one side of each private drive. The project would provide two water quality/retention basins onsite. One is located on the southwest corner of the site and another at the southeast edge of the site. See Figure 3, *Site Plan*.

The project site is currently occupied by an active palm nursery. The project would involve the demolition of existing structures which includes a greenhouse and shed. The project would require an amendment to the City General Plan from Rural Residential (R-R) to Medium Density Residential (MDR) and a zone change from A-1 to R-1B.

1.4 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

1.4.1 Descriptors

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening

hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

1.4.2 Terminology

1.4.2.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

1.4.2.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

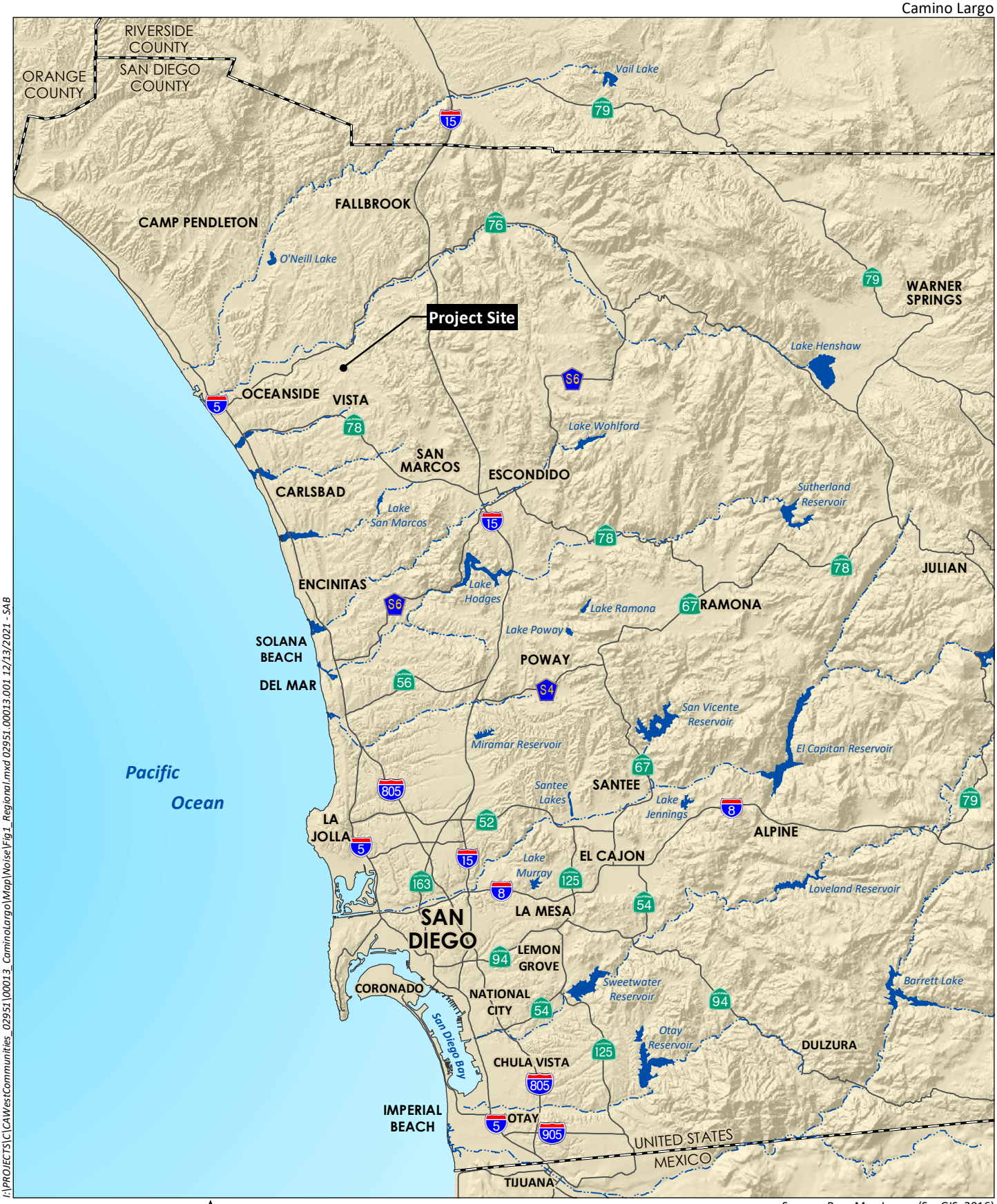
Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this wide range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 mPa.

1.4.2.3 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than from one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz to 8,000 Hz) range. In typical noisy environments, changes in noise of



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0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

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Regional Location

Figure 1

Camino Largo

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0 700 Feet

Source: Aerial (NearMaps, 2019)

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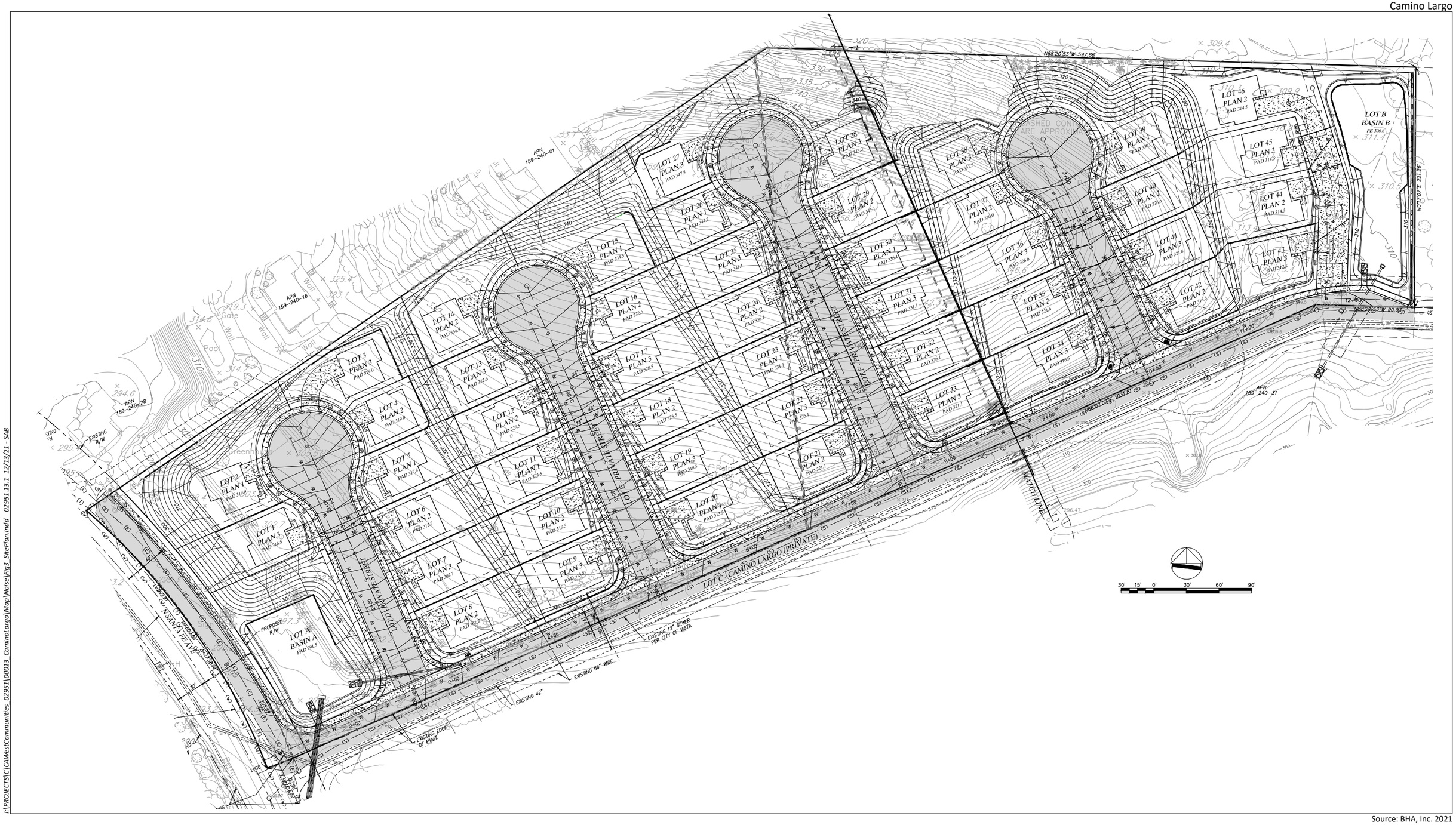
Project Vicinity

Figure 2



Source: BHA, Inc. 2021

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Site Plan

Figure 3

1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

No known studies have directly correlated the ability of a healthy human ear to discern specific levels of change in traffic noise over a 24-hour period. Many ordinances, however, specify a change of 3 CNEL as the significant impact threshold. This is based on the concept of a doubling in noise energy resulting in a 3 dBA change in noise, which is the amount of change in noise necessary for the increase to be perceptible to the average healthy human ear.

1.5 NOISE AND VIBRATION-SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors are individual locations that may be affected by noise. NSLUs in the project vicinity include single-family residences to the north, south, and east.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2018) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Vibration-sensitive land uses in the project area include the nearby single-family residences.

1.6 REGULATORY FRAMEWORK

1.6.1 California Noise Control Act

The California Noise Control Act is a section within the California Health and Safety Code that describes excessive noise as a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

1.6.2 City of Vista General Plan, Noise Element

The Noise Element of the City's General Plan includes a noise/land use compatibility matrix for assessing the suitability of different categories of planned land uses based on exterior noise level exposure (Table NE-3 from the City General Plan; City 2012). For the project's land use (Single Family Residential), the Noise Element specifies exterior noise levels up to 60 CNEL as normally acceptable and up to 70 CNEL is conditionally acceptable. Noise levels exceeding 70 CNEL are generally unacceptable for single-family residential uses.

In addition, the City defines specific maximum noise levels that shall not be exceeded for both interior and exterior use areas. A proposed project shall not generate noise levels that exceed these standards. The City limits interior noise levels to 45 CNEL for single-family residential development. Table 1, *Interior and Exterior Noise Guidelines*, provides limits for various types of land uses.

Table 1
INTERIOR AND EXTERIOR NOISE GUIDELINES

Land Use	Maximum Noise Level (L_{DN} or CNEL, dBA) Interior[1,2]	Maximum Noise Level (L_{DN} or CNEL, dBA) Exterior
Residential – Single Family, Multi-family, Duplex	45	65[3]
Residential – Nursing Homes, Hospital	45	65[3]
Private Offices, Church Sanctuaries, Libraries, Board Rooms, Conference Rooms, Theaters, Auditoriums, Concert Halls, Meeting Halls, etc.	45	-
Schools	45	65[4]
General Offices, Reception, Clerical, etc.	50	-
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	60	-
Manufacturing, Kitchen, Warehousing, etc.	65	-
Parks, Playgrounds, etc.	-	65[4]
Golf Courses, Outdoor Spectator Sports, Amusement Parks, etc.	-	70[4]

Source: City 2012

1 Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.

2 Indoor environment excluding bathrooms, toilets, closets, and corridors.

3 Outdoor environment limited to rear yard of single-family homes, multi-family patios and balconies (with a depth of 6 feet or more) and common recreation areas.

4 Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.

L_{DN}=Day-Night Level; CNEL=Community Noise Equivalent Level; dBA=A-weighted decibel

1.6.3 City of Vista Noise Ordinance (Municipal Code, Chapter 8.32, Noise Control)

Sections 8.32.010 through 8.32.060 of the City of Vista Municipal Code pertain to City noise requirements and enforcement of violations. The City has adopted the County of San Diego Noise Ordinance for the purpose of controlling excessive noise levels, including noise from construction activities.

Table 2, *Applicable Exterior Property Line Noise Limits,* lists the applicable exterior property line noise limits. This table is specific to the City of Vista and replaces the table in Section 36.404 of the County of San Diego noise ordinance. It is unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level at any point on or beyond the boundaries of the property exceeds these limits. The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones.

Table 2
APPLICABLE EXTERIOR PROPERTY LINE NOISE LIMITS

Zone	Time	Applicable Limit One-hour Average Sound Level (Decibels)
A-1, E-1, O, OSR	7:00 a.m. – 10:00 p. m.	50
R-1B, MHP	10:00 p.m. – 7:00 a. m.	45
R-M	7:00 a.m. – 10:00 p.m.	55
	10:00 p.m. – 7:00 a.m.	50
C-1, C-2, O-3, C-T, OP, M-U and Downtown Specific Plan	7:00 a.m. – 10:00 p.m.	60
	10:00 p.m. – 7:00 a.m.	55
M-1, I-P, all areas of the Vista Business Park Specific Plan and Specific Plan 14	Any time	70

Source: City 2014
A-1 = Agricultural; C-1 and C-3 = Commercial; C-T = Commercial Transient; E-1 = Estate; I-P = Industrial; M-1 = Light Manufacturing; MHP = Mobile Home Park; M-U = Mixed Use; O = Open Space; O-3 = Office Park; OP = Office Professional; OSR = Open Space Residential; R-1 and R-1B = Single-family Residential; R-M = Multi-family Residential

The project site will be zoned R-1B (Single-family residential). Neighboring parcels to the south and east are zoned A-1 (Agricultural), and the parcel to the north is zoned C-1 (Commercial).

The adopted County of San Diego Noise Ordinance also stipulates controlling construction noise. San Diego County Code Sections 36.408 and 36.409, Construction Equipment, state that, except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

A. Between 7:00 p.m. and 7:00 a.m.

B. On Sunday or a holiday. For the purposes of this section, a holiday means January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence or for the purpose of construction of a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limits in Sections 36.409 and 36.410.

C. Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 dBA for an 8-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410 of the County of San Diego's ordinance provides additional limitation on construction equipment beyond Section 36.404 pertaining to impulsive noise. Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3*, Maximum Sound Levels (Impulsive)*, when measured at the

boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period.

Table 3
MAXIMUM SOUND LEVELS (IMPULSIVE)

Occupied Property Use	Decibels (dBA) L_{MAX}
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

Source: County of San Diego Municipal Code Section 36.410

The minimum measurement period for any measurements is one hour. During the measurement period, a measurement must be conducted every minute from a fixed location on an occupied property. The measurements must measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

2.0 ENVIRONMENTAL SETTING

2.1 SURROUNDING LAND USES

Adjacent lands surrounding the project site include single-family residences within unincorporated San Diego County to the north; single-family residences to the east, undeveloped land and single-family residences to the south. See Figure 2 for nearby land uses.

2.2 EXISTING NOISE ENVIRONMENT

The existing noise environment is dominated by traffic noise from North Santa Fe Avenue. The project is subject to some distant aircraft noise, though the site is not located near an active airport. The nearest airports are Oceanside Municipal Airport, located approximately 5.7 miles to the west, and McClellan-Palomar Airport, located approximately 7.4 miles to the south.

2.2.1 Ambient Noise Survey

Two measurements were taken for the ambient noise survey, including one measurement at the project site and one along North Santa Fe Avenue to the west. The first measurement was taken along the southern boundary of the project site along Camino Largo, approximately 600 feet west of North Santa Fe Avenue. The second measurement was taken along North Santa Fe Avenue, at a location approximately 850 feet west of Osborne Street. A traffic count was conducted at this location to estimate the breakdown of heavy trucks (three or more axles), medium trucks (double tires/two axles), and automobiles along North Santa Fe Avenue. The measured noise levels are shown in Table 4, *Noise Measurement Results.* Traffic counts for the timed measurement and the one-hour equivalent volume are shown in Table 5, *Recorded Traffic Volume and Vehicle Mix.* Measurement locations are shown on Figure 2.

Table 4
NOISE MEASUREMENT RESULTS

Measurement 1 – Traffic	
Date:	December 8, 2021
Conditions:	Temperature: 55°F. Wind Speed: 1 mph. 77% humidity. Sunny.
Time:	8:24 a.m. – 8:34 a.m.
Location:	Along the southern boundary of the project site 600 feet west of North Santa Fe Avenue
Measured Noise Level:	47.1 dBA L_{EQ}
Notes:	Ambient nature sounds. Noise primarily from traffic on Santa Fe Avenue, landscaping equipment, and distant aircraft.
Measurement 2 – Ambient	
Date:	December 8, 2021
Conditions:	Temperature: 55°F. Wind Speed: 1 mph. 77% humidity. Sunny.
Time:	8:47 a.m. – 9:02 a.m.
Location:	West of project site approximately 850 feet west of Osborne Street and 60 feet from the North Santa Fe Avenue centerline. Adjacent to North Coast Church parking lot.
Measured Noise Level:	67.9 dBA L_{EQ}
Notes:	Noise dominated by traffic along North Santa Fe Avenue.

Table 5
RECORDED TRAFFIC VOLUME AND VEHICLE MIX

Measurement	Roadway	Traffic	Autos	MT[1]	HT[2]
1	North Santa Fe Avenue	15-minute count	196	7	1
		One-hour equivalent	784	28	4
		Percent	96.7%	0.9%	2.3%

[1] Medium Trucks (double tires/two axles)

[2] Heavy Trucks (three or more axles)

3.0 ANALYSIS, METHODOLOGY, AND ASSUMPTIONS

3.1 METHODOLOGY

3.1.1 Ambient Noise Survey

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis LxT Noise Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for

sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

3.1.2 Noise Modeling Software

Modeling of the exterior noise environment for this report was accomplished using two computer noise models: Computer Aided Noise Abatement (CadnaA) version 2019 and Traffic Noise Model (TNM) version 2.5. CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts. CadnaA traffic noise prediction is based on the data and methodology used in the TNM.

TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (California Department of Transportation [Caltrans] 2004). TNM was developed from Computer Aided Design (CAD) plans provided by the project applicant. Input variables included road alignment, elevation, lane configuration, area topography, existing and planned noise control features, projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

Peak-hour traffic volumes are estimated based on the assumption that approximately 10 percent of the average daily traffic would occur during a peak hour. The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic. Peak hour L_{EQ} can be converted to CNEL using the following equation, where $L_{EQ}(h)pk$ is the peak hour L_{EQ}, *P* is the peak hour volume percentage of the average daily trips (ADT), *d* and *e* are divisions of the daytime fraction of ADT to account for daytime and evening hours, and *N* is the nighttime fraction of ADT:

$$CNEL = L_{EQ}(h)pk + 10\log10\ 4.17/P + 10\log10(d + 4.77e + 10N)$$

The model-calculated one-hour L_{EQ} noise output is therefore approximately equal to the CNEL (Caltrans 2013).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require the use of equipment throughout the site for the full term of construction. General project construction activities would include site clearing, demolition, grading, underground utility installation, physical building construction, paving, and application of architectural coatings. The most prominent noise-generating standard construction equipment anticipated to be used on the site includes excavators, front-end loaders, backhoes, scrapers, dozers, rollers, pavers, and mounted impact hammers.

Demolition would be required for an existing on-site structures and pavements. Grading of the site would require approximately 44,130 CY of export, which is anticipated to be exported via 2,758 haul truck trips over the course of 20 days. Approximately 138 trucks per day, or 17 trucks per hour, would be required.

3.2.2 Operations

The proposed project's operational noise sources are anticipated to include heating, ventilation, and air conditioning (HVAC) systems and vehicular traffic. Upon completion, the project would also be exposed to vehicular traffic noise from North Santa Fe Avenue.

3.2.2.1 Heating, Ventilation, and Air Conditioning Units

The analysis assumes that the buildings would use a typical to larger-sized residential condenser mounted on ground level pads. The unit used in this analysis is a Carrier 38HDR060 split system condenser (see Appendix A, *Carrier 38HDR060 Split System Condenser*). The manufacturer's noise data is provided below in Table 6, *Carrier HDR060 Condenser Noise*.

Table 6
CARRIER HDR060 CONDENSER NOISE

Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)[1]
125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	
63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

[1] Sound Power Level (S_{WL})
KHz = kilohertz

3.2.2.2 Vehicular Traffic

Traffic volume data along North Santa Fe Avenue for Existing and Existing + Project conditions were provided by Linscott, Law and Greenspan, Engineers (LLG; 2021). Approximately 25 percent of the project's traffic would travel north along North Santa Fe Avenue, and 75 percent would travel south. Based on the site visit, a typical traffic distribution along North Santa Fe Avenue is 96 percent automobiles, 3.5 percent medium trucks, and 0.5 percent heavy trucks. This breakdown was used in this analysis for non-project traffic. Table 7, *Existing Plus Project Traffic Volumes*, summarizes the ADT data for the segments of Santa Fe Avenue, Osborne Street, and Taylor Street relevant to this analysis.

Table 7
EXISTING PLUS PROJECT TRAFFIC VOLUMES

Roadway Segment	Existing ADT	Project ADT	Existing + Project ADT	Existing + Cumulative + Project ADT
North Santa Fe Avenue				
North of Project	16,834	115	16,949	17,982
South of Project	16,279	345	16,624	17,382

Source: LLG, SANDAG 2020

3.3 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, implementation of the project would result in a significant adverse impact if it would:

Threshold 1: *Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the Vista General Plan or noise ordinance.*

Per the Vista Noise Ordinance, impacts would be significant if the project would generate noise levels at a common property line with the adjacent agricultural zones to the south and east that would exceed the following one-hour average exterior noise levels: 50 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m. The adjacent single-family residential properties to the north of the project site are within unincorporated San Diego County. While the proposed project is not subject to the regulations of the County of San Diego, the same 50 dBA daytime limit and 45 dBA nighttime limits are considered at these property lines for analysis purposes.

For traffic-related noise, impacts are considered significant in areas where traffic noise at single-family residential uses exceeds 65 CNEL and implementation of the project would result in an increase of the noise level by 3 CNEL or more.

Construction activity would be considered significant for nearby residences if it exceeds an 8-hour average exterior noise level of 75 dBA, or a maximum impulsive noise level of 82 dBA on an occupied residential use. The ordinance prohibits construction and building work between the hours of 7:00 p.m. and 7:00 a.m. of the next day, on Sundays, or on a holiday. Construction noise exceeding 10 dBA above ambient noise levels at nearby sensitive receptors would be considered a substantial increase.

Threshold 2: *Generate excessive ground-borne vibration or ground-borne noise levels.*

Excessive ground-borne vibration would occur if construction-related ground-borne vibration exceeds the “strongly perceptible” vibration annoyance potential criteria for human receptors of 0.1 inch per second peak particle velocity (PPV) or the damage potential criteria to relatively old residential structures 0.5 inch per second PPV for continuous/frequent intermittent construction sources (such as impact pile drivers, vibratory pile drivers, and vibratory compaction equipment), as specific by Caltrans (2020).

Threshold 3: *For a project located within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within two miles of a public use airport or private airstrip, expose people residing or working in the project area to excessive noise.*

Excessive noise exposure is defined as noise levels that exceed the standards in the City General Plan Noise Element for the associated land use.

Threshold 4: *Noise compliance for new uses.*

Future land uses would be compliant with the City General Plan Noise Element if the project’s residential exterior use areas are exposed to noise levels below 65 CNEL and interior noise levels below 45 CNEL.

4.0 IMPACTS

4.1 ISSUE 1: EXCESSIVE NOISE LEVELS

Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the Vista General Plan or noise ordinance.

4.1.1 Operational On-site Noise Generation

The project would include HVAC units at ground-level locations adjacent to each proposed residence. Specific locations and planning data for the future HVAC units is not available at this stage of project design; however, the project applicant has indicated that HVAC units would be located on the sides of the proposed residences. Further, as mentioned in Section 3.2.2.1, modeling assumed that the HVAC unit would be a Carrier 38HDR060 split system condenser. A single unit typically generates a noise level of 56 dBA at a distance of 7 feet.

Based on the site plan shown in Figure 3*,* the closest proposed lot to the nearest off-site residential property line would be Lot 3. For the single-family homes, it is likely that the HVAC units would be installed adjacent to the house structure. The nearest off-site residential structure would be approximately 45 feet from the closest potential HVAC location. At this distance, the HVAC would generate a noise level of approximately 39.8 dBA, which would not exceed the City's nighttime allowable hourly limit of 45 dBA; therefore, impacts from the project's operational noise would be less than significant.

4.1.2 Operational Off-site Transportation Noise Generation

The project would generate vehicular traffic that would utilize North Santa Fe Avenue and have the potential to result in increased noise levels at existing single-family residences along the roadway. TNM software was used to calculate the noise contour distances for Existing and Existing + Project conditions along North Santa Fe Avenue. As noted in the assumptions, Existing and Existing + Project traffic noise levels presented in this analysis are based on traffic volumes provided by LLG (2021). Refer to Table 7 for the forecasted ADT data for existing and project-added traffic volumes.

The off-site roadway modeling represents a conservative analysis that does not consider topography or attenuation provided by existing structures. The results of this analysis for the CNEL at the nearest NSLUs to the roadway centerline of North Santa Fe Avenue are shown below in Table 8, *Off-site Traffic Noise Levels.*

Table 8
OFF-SITE TRAFFIC NOISE LEVELS

Roadway Segment	Distance to Nearest NSLU	CNEL at Distance to Nearest NSLU (Existing)	CNEL at Distance to Nearest NSLU (Existing + Project)	CNEL at Distance to Nearest NSLU Change from Existing	Direct Impact[1]
North Santa Fe Avenue					
North of Project	100 feet	62.6	62.7	0.1	No
South of Project	50 feet	69.4	69.5	0.1	No

[1] A direct impact to off-site uses would occur if existing noise levels exceed 65 CNEL at single family residences and the project more than doubles (increases by more than 3 CNEL) the existing noise level.

NSLU = noise sensitive land use; CNEL = Community Noise Equivalent Level

Impacts would be significant in areas where traffic noise at single-family residential uses exceeds the 65 CNEL maximum noise level specified in the City's General Plan Noise Element and implementation of the project results in a significant increase in noise levels, which is considered greater than a perceptible change of 3 CNEL over existing conditions. As shown in Table 8, noise levels would increase by 0.1 CNEL for nearby residences along North Santa Fe Avenue. This increase would not be a perceptible increase and noise impacts from project-generated traffic would be less than significant.

4.1.3 On-site Construction Noise Generation

Construction of the project would require site clearing, demolition of existing structures, grading, installation of underground utilities/infrastructure, construction of new buildings, paving, and architectural coating. The magnitude of the noise impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and any intervening structures. Construction would generate elevated noise levels that may disrupt nearby residences north, south, and east of the project site. Construction equipment would be continuously moving across the site, and equipment is not anticipated to be located at a single location during a typical workday. Therefore, construction equipment is modeled at an average distance of 100 feet from the nearest NSLUs. Table 9, *Construction Equipment Noise Levels*, provides the 100-foot distance noise levels for equipment anticipated to be used for general construction activities.

Table 9
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	L_{MAX} at 100 feet	dBA L_{EQ} at 100 feet
Backhoe	40	71.5	67.6
Compactor	20	77.2	70.2
Compressor	40	71.6	67.7
Concrete Mixer Truck	40	72.8	68.8
Concrete Pump Truck	20	75.4	68.4
Dozer	40	75.6	71.7
Dump Truck	50	70.4	66.5
Excavator	40	74.7	70.7
Front End Loader	40	73.1	69.1
Paver	50	71.2	68.2
Roller	20	74.0	67.0
Excavator/Loader/Dump Truck	40	74.7	73.9

Source: RCNM; USDOT 2008
L_{MAX} = maximum noise level; dBA = A-weighted decibel; L_{EQ} = equivalent sound level

Construction equipment would not all operate at the same time or location and would not be in constant use during the 8-hour operating day. Further, not all the pieces of equipment included in Table 9 would be used within 100 feet off-site residences. A dozer and an excavator may be working on the site simultaneously but would not be working near one another at a given time due to the nature of their respective operations. An excavator, loader, and dump truck were analyzed together for construction noise impacts due to their likelihood of being used in conjunction with one another.

Based on these assumptions, grading operations using an excavator, loader, and dump truck at the nearest NSLU would be 73.9 dBA L_{EQ} at 100 feet (see Appendix B, *Construction Noise Modeling Outputs*). Therefore, construction noise from this equipment was modeled to be below the noise ordinance limit defined in Threshold 4 of 75 dBA L_{EQ} (8-hour), however noise levels may exceed the existing ambient noise levels by 10 dBA.

Ambient noise levels were conducted at the project site approximately 600 feet east of North Santa Fe Avenue. During this short-term measurement, noise levels of 47.1 dBA were taken. Furthermore, using the TNM modeling results for the existing conditions of North Santa Fe Avenue, noise levels 100 feet from the roadway would be approximately 62.7 dBA CNEL[1] . By both measures, construction noise levels would likely exceed the existing ambient noise environment by 10 dBA. Mitigation measure NOI-1 would incorporate a construction noise management plan including the use of temporary sound barriers to reduce noise levels at neighboring NSLUs.

NOI-3 **Construction Noise Management Plan.** Noise levels from project-related construction activities shall not exceed the noise limit specified in San Diego County Code Sections 36.408 and 36.409 of 75 dBA (8-hour average), when measured at the boundary line of the property where the noise is located or any occupied property where noise is being received. A Construction Management Plan that describes the measures included on the construction plans to ensure compliance with the noise limit shall be prepared by the project applicant and submitted to the

[1] As described in Section 2.2.2, the CNEL metric includes evening and nighttime noise levels. Construction would not occur during those hours.

City of Vista Planning Division for approval prior to issuance of the grading permit. The following measures may be included to reduce construction noise:

- Construction equipment to be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment to be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) to be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment to be used instead of pneumatic or internal-combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) to be prohibited.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas to be located as far as practicable from noise sensitive receptors.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent sensitive receptor.
- Temporary sound barriers or sound blankets may be installed between construction operations and adjacent noise-sensitive receptors. Due to equipment exhaust pipes being approximately 7 to 8 feet above ground, a sound wall at least 10 feet in height above grade, to block the line-of-sight between project construction activities and residences along the northern, southern, and eastern property lines. These barriers would mitigate noise levels to within acceptable levels. To effectively reduce noise levels, the sound barrier should be constructed of a material with a minimum weight of two pounds per square foot with no gaps or perforations and remain in place until the conclusion of demolition, grading, and construction activities.
- The project applicant shall notify residences within 100 feet of the project's property line in writing within one week of any construction activity such as demolition, hard rock handling, concrete sawing, asphalt removal, and/or heavy grading operations. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of a complaint and response procedure.
- The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for the affected resident shall be established prior to construction commencement to allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

4.1.4 Construction Traffic Noise

As discussed in Section 3.2.1., it is anticipated that 2,758 round trips, or 5,516 one-way haul truck trips would be required for soil export over the course of 20 workdays during the grading phase of construction, which would equate to 276 one-way haul truck trips, or passes, per day. Over the course of an eight-hour construction day, it is assumed 34 haul truck trips would occur per hour. This daily traffic level associated with soil export is anticipated to be the highest daily traffic level associated with project construction.

The additional 34 construction trips were added to the existing traffic volumes on North Santa Fe Avenue south of the project site. Using TNM, receivers were modeled at 50 feet from the roadway centerline (the approximate distance to the nearest single family residential NSLUs), and construction haul trips were modeled as heavy trucks. As presented above in Table 8 of Section 4.1.2, the modeled existing traffic noise level along this segment of North Santa Fe Avenue is 69.4 CNEL. The addition of the project's haul truck trips during the grading phase of construction would increase noise levels to 70.1 CNEL, which represents a 0.7 CNEL increase. This would not be a perceptible increase and impacts from construction traffic noise to existing NSLUs would be less than significant.

4.2 ISSUE 2: EXCESSIVE VIBRATION

Would the project expose persons to or generate excessive ground-borne vibration or noise levels?

4.2.1 Construction Vibration

A possible source of vibration during general project construction activities would be a vibratory roller, which may be used for compaction of soil beneath building foundations and could be used within 50 feet of the off-site residence north of Lot 3. Most usage of a vibratory roller, however, would occur at distances greater than 50 feet from any single residence due to the mobile nature of its use across the project site. A vibratory roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2020). A 0.210 inch per second PPV vibration level would equal 0.098 inch per second PPV at a distance of 50 feet.[2] This would be lower than the structural damage impact to older structures of 0.5 inch per second PPV and the "strongly perceptible" impact for humans of 0.1 inch per second PPV. Additionally, off-site exposure to such ground-borne vibration would be temporary as it would be limited to the short-term construction period. Therefore, even though vibration may be perceptible at nearby residences, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

4.2.2 Operational Vibration

As a residential development, the project would not generate excessive ground-borne vibration during operations; therefore, no impacts would occur.

[2] Equipment PPV = Reference PPV * $(25/D)^n$ (inches per second), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013b.

4.3 ISSUE 3: AIRPORT NOISE EXPOSURE

Would the project expose people residing or working in the project area to excessive noise from a nearby public use airport or private airstrip?

4.3.1 Aircraft Noise

The project is subject to some distant aircraft noise, though the site is not located near an active airport. The nearest airports are Oceanside Municipal Airport, located approximately 5.7 miles to the west and McClellan-Palomar Airport, located approximately 7.4 miles to the south. At these distances, no effects related to airport noise would occur at the project site, and impacts would be less than significant.

4.4 ISSUE 4: NOISE COMPLIANCE FOR NEW USES

4.4.1 Exterior Noise Levels

Future on-site residential land uses would be exposed to noise from vehicular traffic along North Santa Fe Avenue west of the project site. The noise levels associated with vehicular traffic were modeled at the project site using TNM. Modeling used Horizon Year + Project ADT to conservatively assess future traffic noise conditions at the project site. The new residential land uses would not be compliant with the General Plan Noise Element limits if exterior use areas are exposed to noise exceeding 65 CNEL.

Using TNM, noise level contours were generated for North Santa Fe Avenue. The model provides the distances at which noise levels would exceed 65 CNEL. The 65 CNEL noise level contour would extend approximately 100 feet from the roadway centerline. The backyard exterior use areas of Lots 1 and 2 are located approximately 90 feet from the North Santa Fe Avenue. Therefore, at this distance, these areas may not be compatible with the City General Plan limits for residential developments. Mitigation measure NOI-2 would require the placement of permanent noise walls to reduce noise levels at these locations.

NOI-2 **On-Site Noise Barriers**. Noise levels within the backyard areas of Lots 1 and 2 may be exposed to noise levels exceeding the City General Plan noise compatibility standards and shall be reduced to below 65 CNEL.

Noise reduction for these exterior use areas shall be accomplished through on-site noise barriers (walls). The wall shall be at least 6 feet in height and would break the line-of-sight between the backyards and North Santa Fe Avenue. To appropriately reduce noise levels, the wall should be constructed at the pad elevation for each Lot.

The sound attenuation barrier must be solid. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one inch total thickness or have a density of at least 3.5 pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic 3/8 of an inch thick or thicker may be used on the upper portion, if it is desirable to preserve a view.

4.4.2 Interior Noise Levels

Traditional architectural materials are conservatively estimated to attenuate noise levels by 15 CNEL; therefore, if exterior noise levels at a building façade exceed 60 CNEL, interior noise levels may exceed the 45 CNEL limit set forth in the City General Plan Noise Element for residential uses. The 60 CNEL noise level contour generated by North Santa Fe Avenue would extend 170 feet from the roadway centerline. The residences on Lots 1 and 2 have façades that are located within 110 feet of the North Santa Fe Avenue and would therefore be exposed to noise levels exceeding 60 CNEL. To ensure that the project's habitable rooms do not exceed 45 CNEL, mitigation measure NOI-3 would be required.

NOI-3 **On-site Interior Noise Level Reduction**. For the project's Lot 1 and 2 habitable areas (both living rooms and bedrooms), the following measures shall be incorporated in the design of the project to reduce interior noise levels to 45 CNEL or less:

- Minimum exterior wall requirement of STC 46 with a construction of standard 3/8-inch exterior one coat stucco over 1.0-inch rigid R-4 insulation over 1/2-inch shearwall on 2x6 studs with 5/8-inch Type "X" Drywall.
- Minimum window requirement of STC 28 with a vinyl frame window construction of dual glazing window thickness 1/8-inch and 1/2-inch air gap.
- Appropriate means of air circulation and provision of fresh air intake shall be incorporated in the project to allow windows to remain closed for extended intervals of time so that acceptable levels of noise can be maintained on the interior.
- Buildings shall provide mechanical ventilation in accordance with the 2019 California Mechanical Code.

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Appendix A

Carrier 38HDR060 Split System Condenser

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/ HACR BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018	208/230–1–60	187	253	9.0	48.0	0.80	0.125	0.09	12.1	20
024	208/230–1–60	187	253	12.8	58.3	0.80	0.125	0.09	16.8	25
030	208/230–1–60	187	253	14.1	73.0	1.45	0.25	0.19	19.1	30
036	208/230–1–60	187	253	14.1	77.0	1.45	0.25	0.19	19.1	30
	208/230–3–60	187	253	9.0	71.0	1.45	0.25	0.19	12.7	20
	460–3–60	414	506	5.6	38.0	0.80	0.25	0.19	7.8	15
048	208/230–1–60	187	253	21.8	117.0	1.45	0.25	0.19	28.7	50
	208/230–3–60	187	253	13.7	83.1	1.45	0.25	0.19	18.6	30
	460–3–60	414	506	6.2	41.0	0.80	0.25	0.19	8.6	15
060	208/230–1–60	187	253	26.4	134.0	1.45	0.25	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.45	0.25	0.19	21.5	35
	460–3–60	414	506	7.8	52.0	0.80	0.25	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditininng, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.

SOUND LEVEL

Unit Size	Standard Rating (dB)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018	12 (6.7)
024	12 (6.7)
030	12 (6.7)
036	12 (6.7)
048	12 (6.7)
060	12 (6.7)

Appendix B

Construction Noise Modeling Outputs

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/7/2021
Case Description:

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential	Residential	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	100	0
Compactor (ground)	No	20		83.2	100	0
Compressor (air)	No	40		77.7	100	0
Concrete Mixer Truck	No	40		78.8	100	0
Concrete Pump Truck	No	20		81.4	100	0
Dozer	No	40		81.7	100	0
Dump Truck	No	40		76.5	100	0
Excavator	No	40		80.7	100	0
Front End Loader	No	40		79.1	100	0
Paver	No	50		77.2	100	0
Roller	No	20		80	100	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Backhoe	71.5	67.6	N/A	N/A	N/A	N/A
Compactor (ground)	77.2	70.2	N/A	N/A	N/A	N/A
Compressor (air)	71.6	67.7	N/A	N/A	N/A	N/A
Concrete Mixer Truck	72.8	68.8	N/A	N/A	N/A	N/A
Concrete Pump Truck	75.4	68.4	N/A	N/A	N/A	N/A
Dozer	75.6	71.7	N/A	N/A	N/A	N/A
Dump Truck	70.4	66.5	N/A	N/A	N/A	N/A
Excavator	74.7	70.7	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A
Paver	71.2	68.2	N/A	N/A	N/A	N/A
Roller	74	67	N/A	N/A	N/A	N/A
Total	77.2	79.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

IS/MND Appendix H

Local Transportation Study

LINSCOTT LAW & GREENSPAN engineers

LOCAL TRANSPORTATION STUDY

CAMINO LARGO

Vista, California
November 30, 2021

LLG Ref. 3-21-3452

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APPENDIX

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LOCAL TRANSPORTATION STUDY

CAMINO LARGO

Vista, California
November 30, 2021

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has prepared this study to document the Vehicle Miles Traveled (VMT) screening process and conduct a Local Mobility Analysis for the proposed Vista Camino Largo ("Project"). The Project consists of 46 single-family residential units located on the northeast corner of the N. Santa Fe Avenue and Camino Largo intersection.

The following items are included in this traffic study:

- Project Description
- Existing Conditions Description
- VMT Assessment
- Analysis Approach and Methodology
- Substantial Effect Criteria
- Existing Conditions Analysis
- Trip Generation/Distribution/Assignment
- Cumulative Projects Discussion
- Near-Term Capacity Analysis
- Site Access and Circulation Review
- Pedestrian, Bicycle and Transit Assessment
- Recommendations

2.0 PROJECT DESCRIPTION

The proposed Camino Largo Project is located on the northeast corner of the N. Santa Fe Avenue and Camino Largo intersection in the City of Vista. The Project is proposing to develop 46 single-family residential houses. The General Plan designation for this parcel Rural Residential. This project will require a General Plan Amendment to Medium Density Residential. Access to the Project would be provided via Camino Largo.

Figure 2–1 depicts the vicinity map, and ***Figure 2–2*** is the Project area map. ***Figure 2–3*** depicts the conceptual site plan.

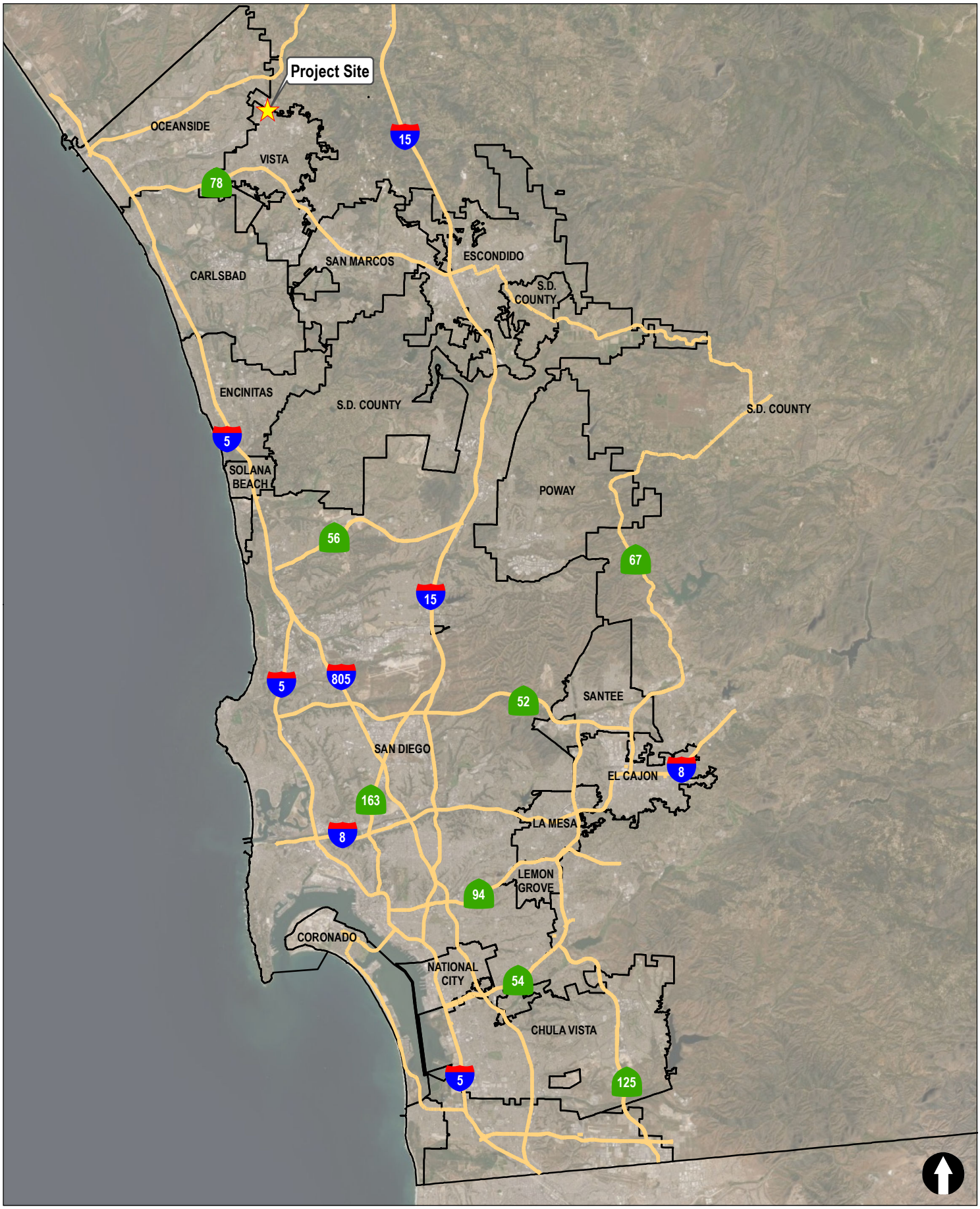

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Figure 2-1

Vicinity Map

Camino Largo

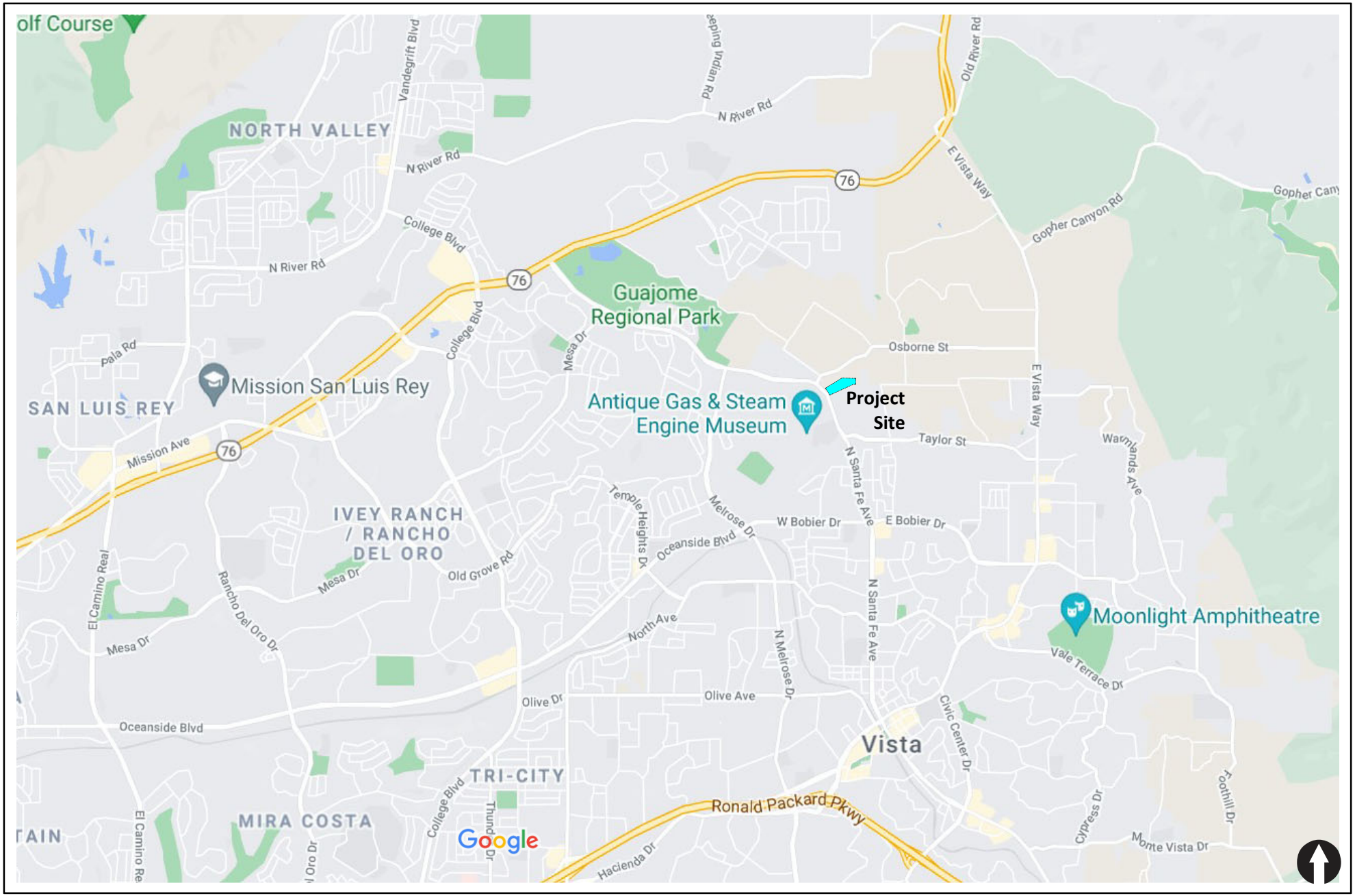

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Figure 2-2

Project Area Map

Camino Largo

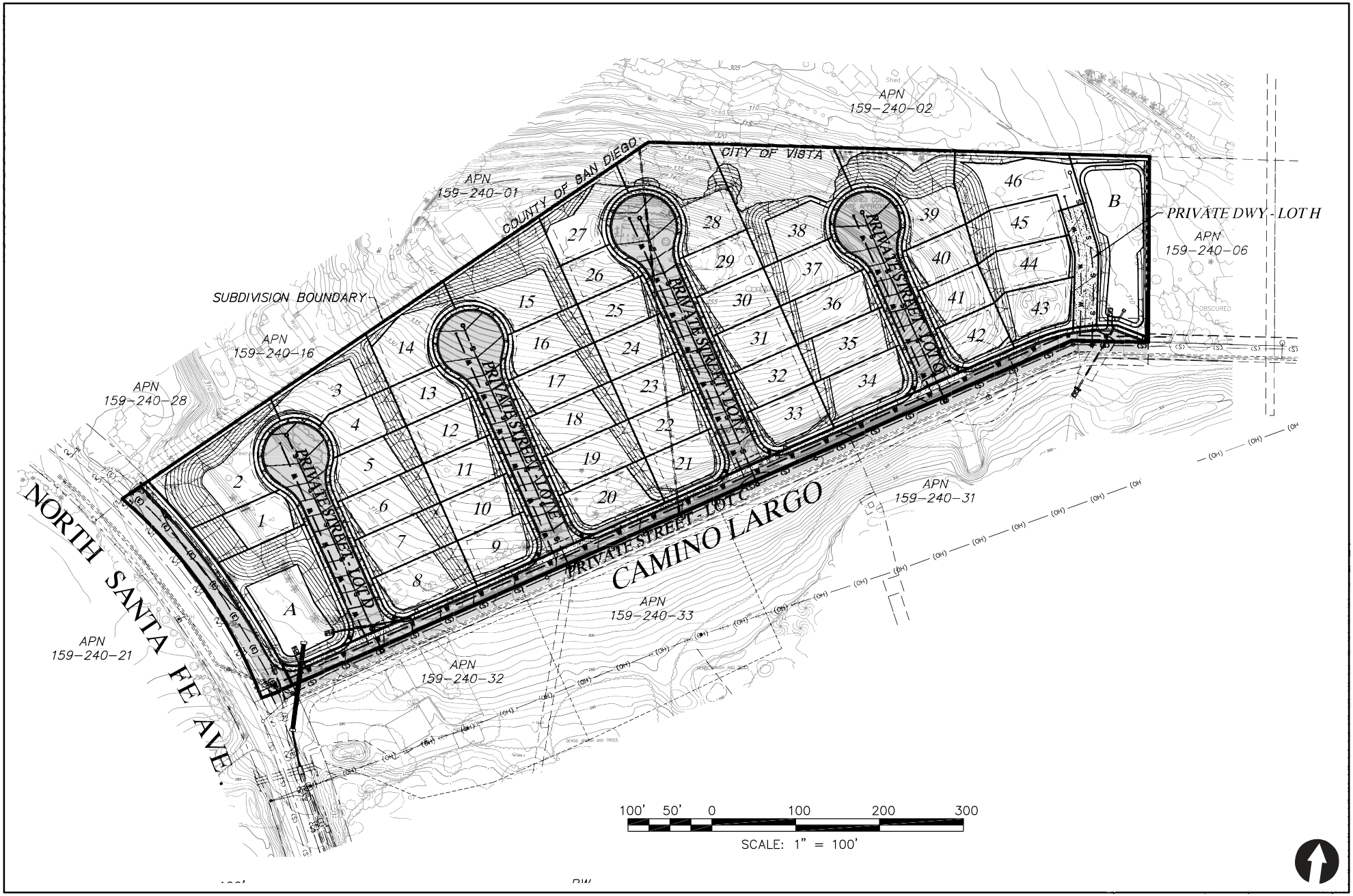

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Figure 2-3

Site Plan

Camino Largo

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project area. ***Figure 3–1*** shows the Existing conditions diagram, including intersection control and lane configurations. The study area includes the following intersections and street segments based on the anticipated distribution of the project traffic:

Intersections

1. N Santa Fe Ave & Osborne St
2. N Santa Fe Ave & Camino Largo
3. N Santa Fe Ave & Taylor St
4. N Santa Fe Ave & Bobier Dr

Street Segments

N Santa Fe Avenue

- North of Osborne Street to Melrose Drive
- Osbore Street to Camino Largo
- Camino Largo to Taylor Street
- Taylor Street to E. Bobier Drive
- South of Bobier Drive to Cananea Street

3.1 Existing Street Network

The principal roadways in the Project study area are described briefly below. Roadway classification was determined based on a review of the *City of Vista Circulation Element* and information gathered from field observations.

N. Santa Fe Avenue is classified as a 4-Lane Major street on the City of Vista Circulation Element. It is built as a 2-lane street with a two-way left-turn lane in the majority of Project study area. N. Santa Fe Avenue is built as a 4-lane divided roadway north of Melrose Drive. Between Melrose Drive and Osbore Street, N. Santa Fe Avenue varies from a 3-lane roadway with a two-way left-turn lane and a 4-lane roadway with a two-way left-turn lane. Between Osborne Street and Museum Way, N. Santa Fe Avenue is built as a 2-lane roadway with a two-way left-turn lane. Between Museum Way and Taylor Street, N. Santa Fe Avenue is built as a 3-lane roadway with a two-way left- lane. Between Taylor Street and Bobier Drive, N. Santa Fe Avenue is built as a 2-lane roadway with a two-way left- lane. South of Bobier Drive, N. Santa Fe Avenue is built as a 4-lane roadway with a two-way left- lane and then transitions into a 4-lane divided roadway about 500 feet south of Bobier Drive. Limited on-street parking is permitted on the west side of the road. No bicycle facilities are provided on N. Santa Fe Avenue in the Project vicinity. A contiguous sidewalk currently exists on the west side of the street. The posted speed limit is 45 mph.

Osborne Street is an un-classified roadway. It is built as a two-lane undivided roadway. No on-street parking is permitted. No bicycle facilities are provided. No sidewalks provided. The posted speed limit is 35 mph.

Camino Largo is an un-classified roadway. It is built as a two-lane street and provides access to the Project Site. No on-street parking is permitted. No bicycle facilities are provided. No sidewalks provided. There is no posted speed limit.

Taylor Street is classified as a 2-Lane Collector (w/ Two-Way Left-Turn Lane) on the City of Vista Circulation Element. It is built as a two-lane street with a two-way left-turn lane in the Project study area. On-street parking is permitted on both the north and south sides of the road. No bicycle facilities are provided on Taylor Street in the Project vicinity. A contiguous sidewalk currently exists on the both the north and south sides of the street. The posted speed limit is 35 mph.

Bobier Drive is classified as a 4-Lane Major street on the City of Vista Circulation Element. It is built as a four-lane street with a two-way left-turn lane in the Project study area. On-street parking is permitted on both the north and south sides of the road. Bicycle lanes are provided on Bobier Drive in both the eastbound and westbound directions in the Project vicinity. A contiguous sidewalk currently exists on the both the north and south sides of the street. The posted speed limit is 40 mph.

3.2 Existing Traffic Volumes

Weekday AM/PM peak period intersection turning movement counts were conducted in October 2021 at four (4) study intersection and five (5) street segments. The intersection counts were conducted between the hours of 7:00-9:00 AM and 4:00-6:00 PM. ***Appendix A*** contains the count sheets.

Figure 3–2 depicts the Existing traffic volumes.

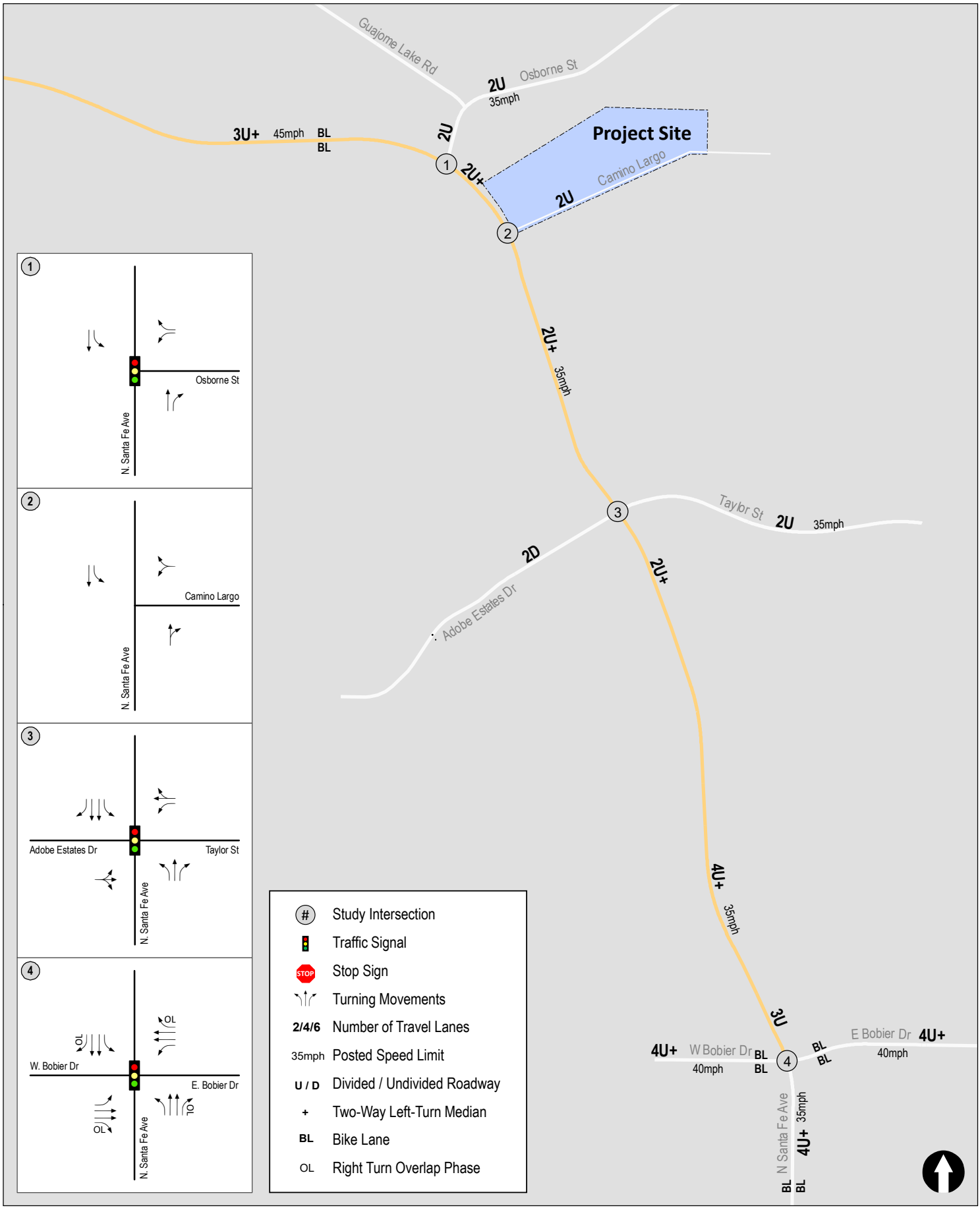

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Figure 3-1

Existing Conditions Diagram

Camino Largo

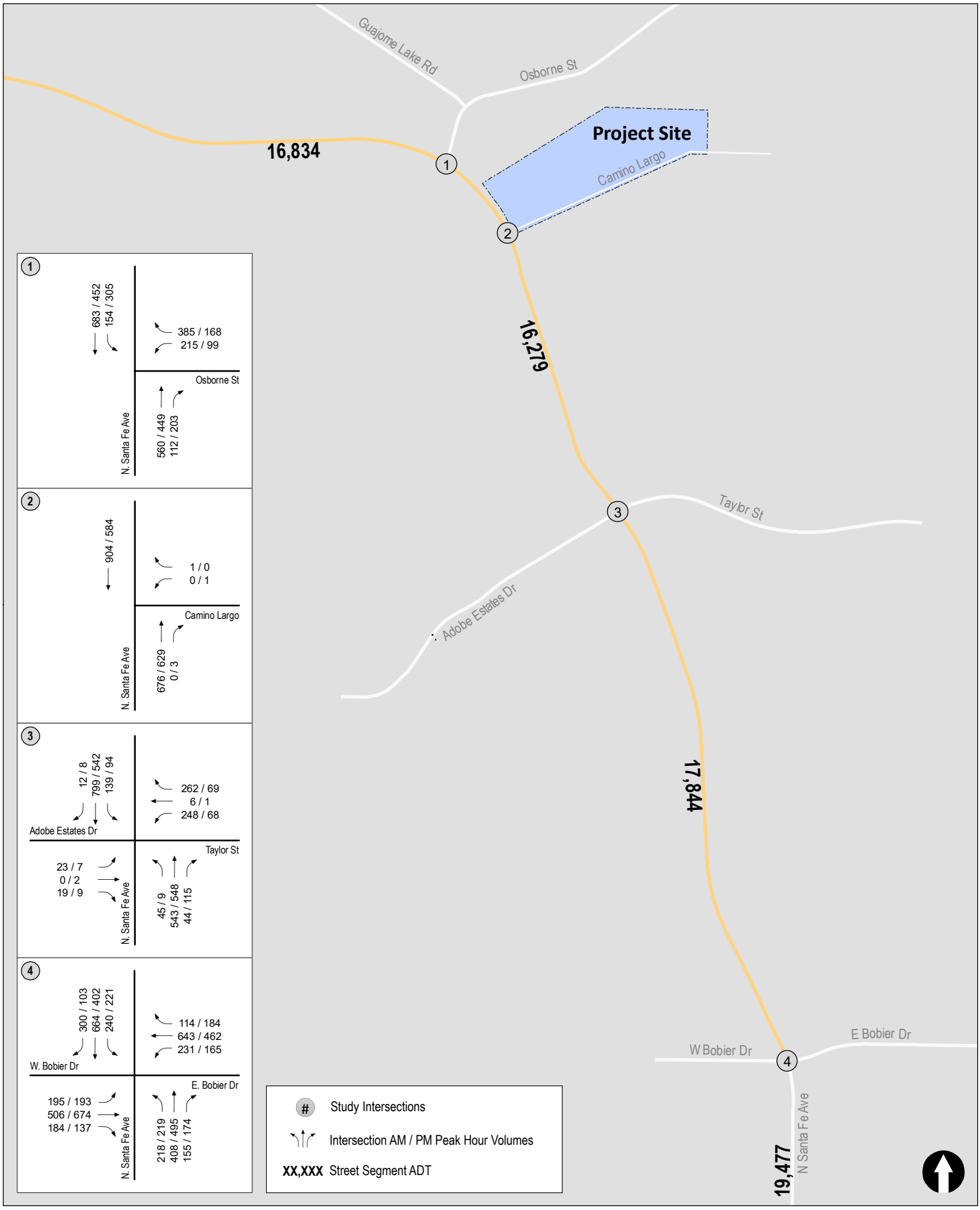

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Figure 3-2

Existing Traffic Volumes

Camino Largo

4.0 VEHICLES MILES TRAVELED ASSESSMENT

An assessment was conducted to determine the impacts on Vehicle Miles Traveled (VMT) for the Project. This assessment utilizes methodologies presented within the Governor's Office of Planning and Research (OPR) Technical Advisory developed to assist with implementation of Senate Bill 743 (SB 743), which resulted in a shift in the measure of effectiveness for determining transportation impacts from Level of Service (LOS) and vehicular delay to VMT. VMT analyses are required for use in all California Environmental Quality Act (CEQA) documents no later than July 1, 2020.

The VMT analysis thresholds are based on the City of Vista's *Transportation Impact Analysis Guidelines.*

The Project proposes 46 single-family residential houses which will generate a total of 460 trips per day as shown in Table 8-1. The project is not consistent with the General Plan.

Per the City of Vista's *Transportation Impact Analysis Guidelines*, projects that are considered inconsistent with the General Plan and generate an average daily traffic volume (ADT) of 500 trips or less do not need a VMT analysis.

Due to the Project's ADT volumes, it is presumed that the Project has no significant transportation impacts for the purposes of CEQA, and no VMT-related improvements are required.

5.0 ANALYSIS APPROACH AND METHODOLOGY

5.1 Analysis Approach

The following scenarios were analyzed in the traffic report:

- Existing
- Existing + Project
- Existing + Cumulative Projects
- Existing + Cumulative Projects + Project
- Horizon Year
- Horizon Year + Project

5.2 Analysis 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 and unsignalized intersections, as well as for roadway segments.

There are various methodologies used to analyze signalized intersections, unsignalized intersections, and street segments. The measure of effectiveness for intersection and segment operations is level of service (LOS), which denotes the operating conditions which occur at a given intersection or on a given roadway segment under various traffic volume loads.

LOS 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. Levels of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments. In the Highway Capacity Manual (HCM), 6th Edition, Level of Service for signalized intersections is defined in terms of delay. The level of service analysis results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

Table 5–1 depicts the intersection LOS and corresponding delay ranges, which are based on overall intersection delay (signalized intersections) and the average control delay for any particular minor movement (unsignalized intersections), respectively.

5.2.1 *Signalized Intersections*

For signalized intersections, level of service criteria is stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-

up time, stopped delay, and final acceleration delay. Following is a brief description of the Levels of Service A through F.

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of Average delay.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher volume (demand) / capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are frequent.

TABLE 5–1
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	**Unsignalized Intersections**
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: Highway Capacity Manual 6th Edition.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

5.2.2 *Unsignalized Intersections*

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement: level of service is not defined for the intersection as a whole. Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

5.2.3 *Street Segments*

Roadway segment Level of Service (LOS) standards and thresholds provide the basis for analysis of roadway segment performance. Roadway segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of Vista Circulation Element Roadway Classification – Capacity and Levels of Service Table (provided in **Appendix F**). This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

6.0 SUBSTANTIAL EFFECT CRITERIA

The Circulation Element of the Vista General Plan 2030 Update (December 2011, page 3-14) states, "the City has established LOS D as the threshold for acceptable operating conditions in designated areas. Intersections and roadway segments operating at LOS D or better are considered to operate at acceptable levels of service." Roadway segment capacity and LOS 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 attributes. Typically, however, the performance and LOS of a roadway segment is heavily influenced by the ability of an intersection to accommodate peak hour volumes. Within Vista and the San Diego region as a whole, intersection performance rather than roadway segment performance is considered a better indicator of poor traffic operations. Therefore, it should be used as the basis for traffic impact analyses and recommendations for corrective improvements.

A project is considered to have a substantial effect on the operation of an intersection when one of the following occurs:

- THE ADDITION OF PROJECT TRAFFIC RESULTS IN A SERVICE DROP FROM LOS D OR BETTER TO LOS E OR F.
  Under this condition, the project applicant would be responsible for direct project impact mitigation necessary to restore the intersection to LOS D conditions or better.

- WHEN AN INTERSECTION IS OPERATING AT LOS E OR F UNDER THE NO-PROJECT SCENARIO AND THE PROJECT ADDS MORE THAN AN ADDITIONAL TWO SECONDS OF AVERAGE VEHICLE DELAY.
  Under this condition, the project applicant would be responsible for direct project impact mitigation necessary to restore the intersection LOS to pre-development conditions or better.

- IN THE LONGER-RANGE CUMULATIVE CONDITION, IF THE ADDITION OF PROJECT TRAFFIC RESULTS IN A SERVICE DROP FROM LOS D OR BETTER TO LOS E OR F, OR IF AN INTERSECTION IS OPERATING AT LOS E OR F AND THE PROJECT CONTRIBUTES TO THE AVERAGE VEHICLE DELAY (REGARDLESS OF TIME), THE PROJECT IS DETERMINED TO HAVE A CUMULATIVELY SIGNIFICANT IMPACT.
  Under this condition, the project applicant would be responsible for mitigating the intersection LOS to pre-development conditions or better. Identified cumulative transportation related impacts can be mitigated by participation in the City of Vista's Impact fees for Arterial Streets and Traffic Signals program.

As stated previously, roadway segment Level of Service (LOS) standards and thresholds provide the basis for analysis of roadway segment performance. Roadway segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of Vista Circulation Element Roadway Classification – Capacity and Levels of Service Table (provided in **Appendix F**). This table provides segment capacities for different street classifications, based on traffic volumes and roadway

characteristics. The City of Vista's Transportation Impact Analysis Guidelines (December 2020 Final) page 25 states:

> "The actual capacity of a roadway facility varies according to its physical attributes. Typically, the performance and LOS of a roadway segment is heavily influenced by the ability of the intersections to accommodate peak hour volumes. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. **Therefore, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes and/or to meet the street cross sections in the Circulation Element adjacent to the project boundary.** Within the City of Vista and the region as a whole, intersection performance, rather than roadway segment performance, is a more accurate and realistic indicator of true traffic operations and is used as the basis for defining traffic impacts."

7.0 ANALYSIS OF EXISTING CONDITIONS

The analysis of existing conditions includes the assessment of the study area intersection and street segment using the methodologies described in *Section 5.0*.

7.1 Peak Hour Intersection Levels of Service

Table 7–1 summarizes the existing intersection level of service. As seen in *Table 7–1*, the study area intersections are calculated to currently operate at LOS D or better.

Appendix C contains the Existing intersection analysis worksheets.

TABLE 7–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. N Santa Fe Ave / Osborne St	Signal	AM	23.5	C
		PM	15.0	B
2. N Santa Fe Ave / Camino Largo	TWSC [c]	AM	13.6	B
		PM	16.5	C
3. N Santa Fe Ave / Taylor St	Signal	AM	29.9	C
		PM	17.2	B
4. N Santa Fe Ave / Bobier Dr	Signal	AM	50.1	D
		PM	46.9	D

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Two-Way Stop Controlled. Worst delay is reported.

SIGNALIZED		UNSIGNALIZED	
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

7.2 Daily Street Segment Levels of Service

Table 7–2 summarizes the existing roadway segment operations. As seen in *Table 7–2*, several study area segments are calculated to currently operate worse than LOS C:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo
- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

TABLE 7–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Functional Classification [a]	Capacity (LOS E)	ADT [c]	LOS [d]
N. Santa Fe Avenue				
North of Osborne Street	4-Lane Collector (undivided)	25,000	16,834	B
Osborne Street to Camino Largo	2-Lane Collector (with TWLTL)	15,000	15,120	F
Camino Largo to Taylor Street	2-Lane Collector (with TWLTL)	15,000	16,279	F
Taylor Street to Bobier Drive	2-Lane Collector (with TWLTL)	15,000	17,844	F
South of Bobier Drive	4-Lane Collector (undivided)	25,000	19,477	C

Footnotes:

a. *City of Vista Circulation Element* roadway classification at which the roadway currently functions.
b. The capacity of the roadway at Level of Service E.
c. Average Daily Traffic Volumes.
d. Level of Service.
e. Volume to Capacity.

8.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

8.1 Project Trip Generation

The project trip generation was calculated using the trip rates published by the San Diego Association of Governments (SANDAG) in the *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002* for residential homes.

Table 8–1 tabulates the total project traffic generation. As shown in Table 8–1, the project is calculated to generate 460 ADT with 11 inbound / 26 outbound trips during the AM peak hour and 32 inbound / 14 outbound trips during the PM peak hour.

TABLE 8–1
PROJECT TRIP GENERATION

Land Use & Size	Trip Rate	ADT	AM Peak Hour				PM Peak Hour			
			% of ADT	In:Out Split	Volume In	Volume Out	% of ADT	In:Out Split	Volume In	Volume Out
Single-family 46 Dwelling Units (DU)	10 / DU	460	8%	30:70	11	26	10%	70:30	32	14

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

8.2 Trip Distribution/Assignment

The project traffic was distributed and assigned to the street system based on the project's proximity to state highways and arterials. ***Figure 8–1*** depicts the Projects Trip Distribution. ***Figures 8–2*** depicts the Project Traffic Volumes and ***Figures 8–3*** depicts the Existing + Project Traffic Volumes.

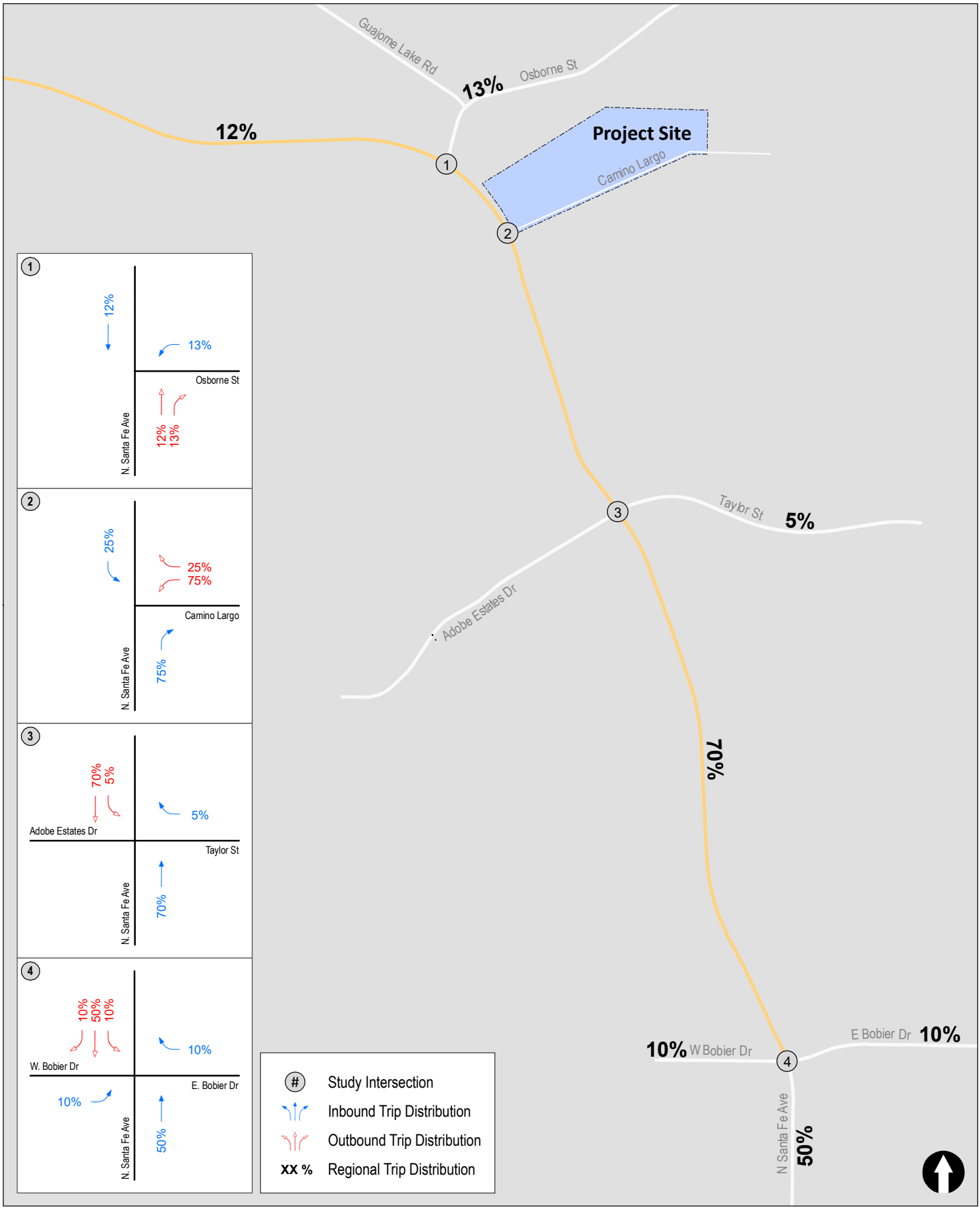

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Figure 8-1

Project Traffic Distribution

Camino Largo

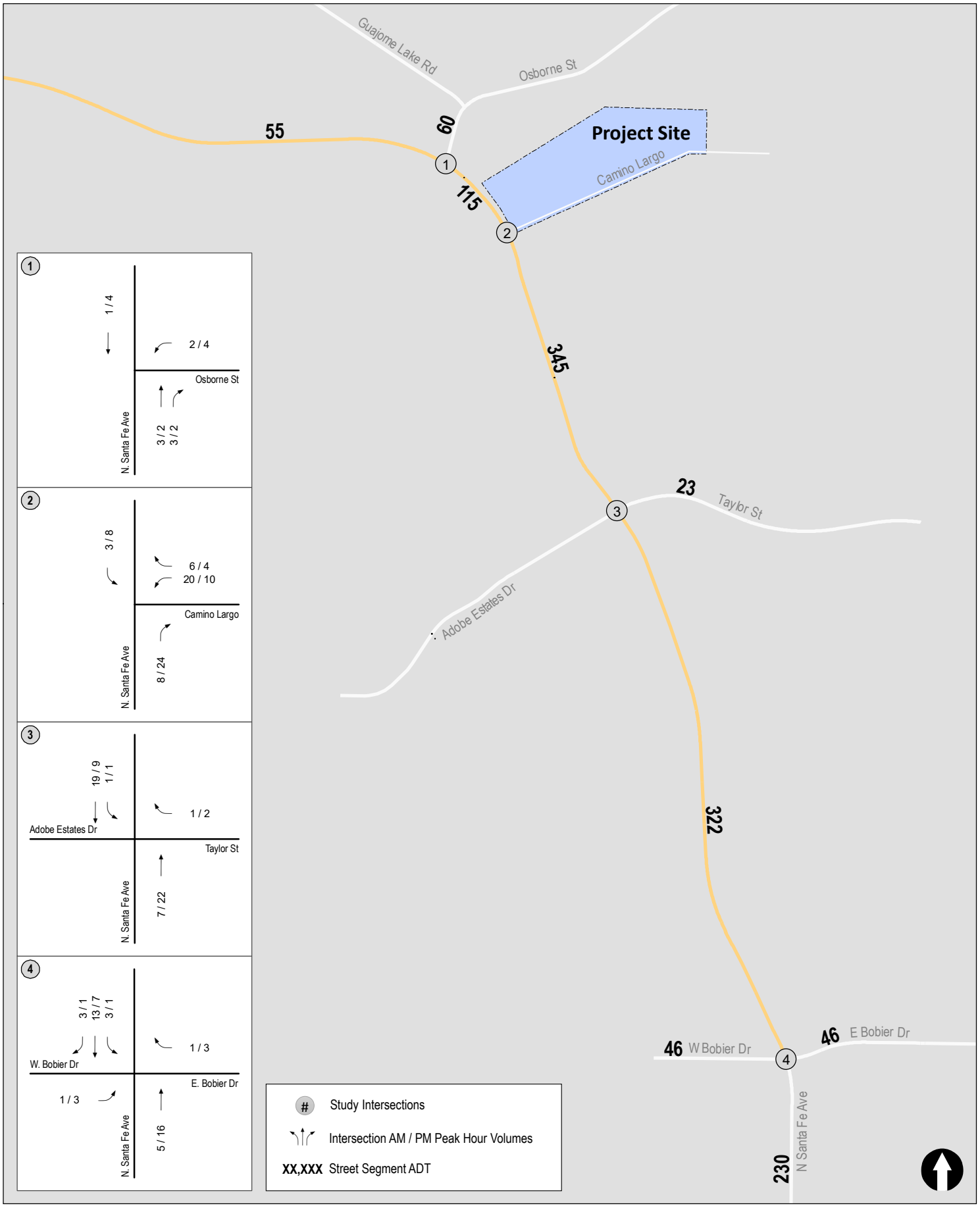

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Figure 8-2

Project Traffic Volumes

Camino Largo

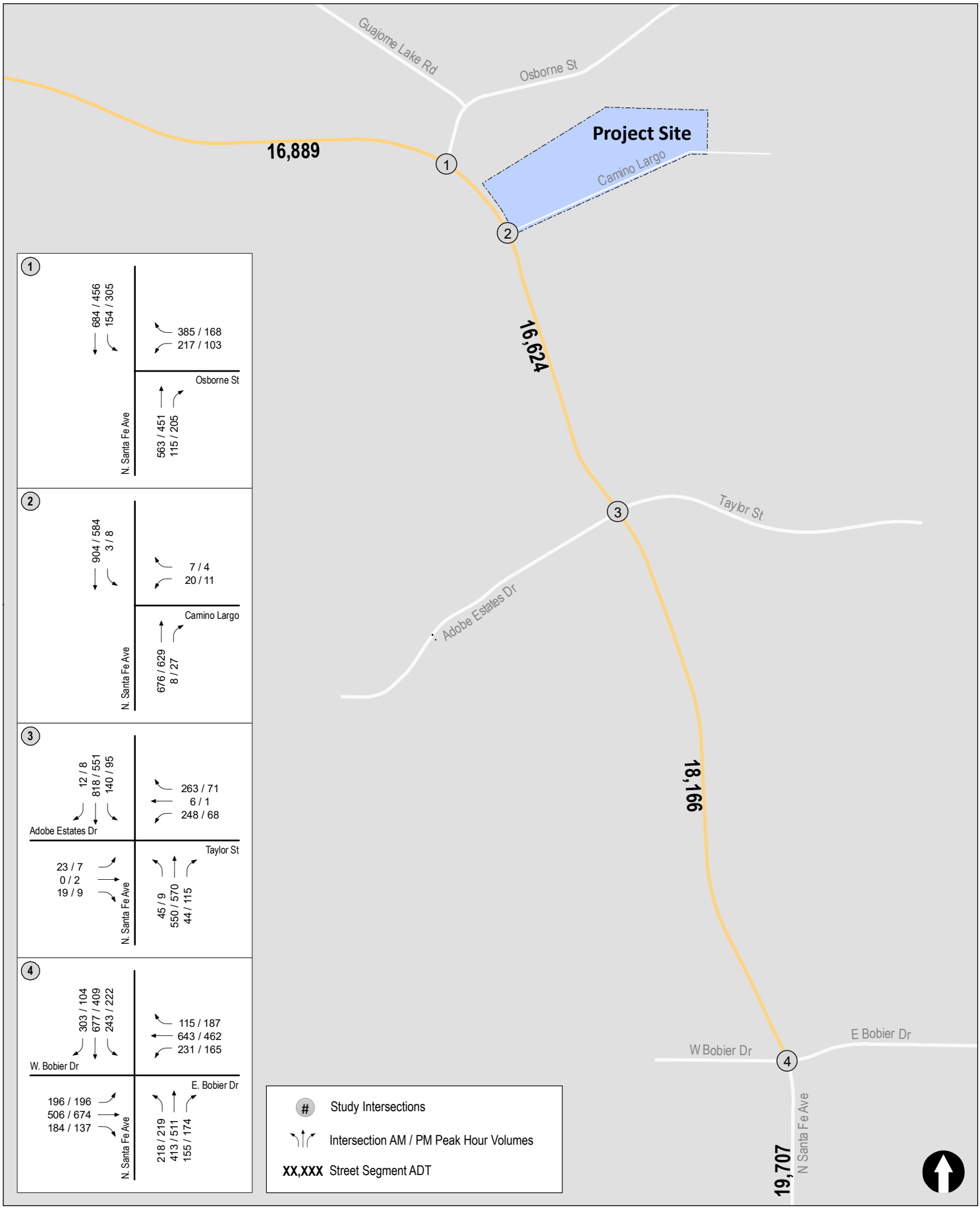

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Figure 8-3

Existing + Project Traffic Volumes

Camino Largo

9.0 CUMULATIVE TRAFFIC

There are other planned projects within the vicinity, which will add traffic to the roadways and intersections in the study area. Based on a review of other potential projects within the area, it was determined that the following cumulative development projects should be included in the traffic analysis.

In addition to the traffic produced by the cumulative projects in the vicinity, an additional 5% growth factor was incorporated to account for other potential cumulative traffic.

LLG prepared the traffic studies for 3 of the 5 cumulative projects. ***Appendix H*** includes excerpts from those traffic studies.

9.1 Descriptions of Cumulative Projects

Detailed below are brief descriptions of these cumulative projects.

1. North Santa Fe Plaza Apartments

The Santa Fe Apartments project is a 19-unit apartment and a 760 square foot coffee shop project located at 1558 N. Santa Fe Ave. The project is calculated to generate 646 ADT with 36 AM peak hour trips (18 inbound and 18 outbound) and 47 PM peak hour trips (26 inbound and 21 outbound trips).

2. Alliance North Santa Fe

The Alliance North Santa Fe project is a 60-unit apartment project located at 1559 N. Santa Fe Ave. The project would generate 360 ADT with 29 AM peak hour trips (6 inbound and 23 outbound) and 32 PM peak hour trips (22 inbound and 10 outbound).

3. Vista Marketplace Expansion

The Vista Marketplace Expansion project is a 4,980 square foot retail expansion project located at 1461 N. Santa Fe Ave. The project would generate 596 ADT with 24 AM peak hour trips (14 inbound and 10 outbound) and 60 PM peak hour trips (30 inbound and 30 outbound).

4. Melrose Heights

The Melrose Heights project is a mixed use project that includes 301 apartment units and 20,000 square feet of commercial space. The project is located at the intersection of N. Melrose Drive and Oceanside Boulevard/West Bobier Drive. The project would generate 4,049 ADT with 340 AM peak hour trips (125 inbound and 215 outbound) and 360 PM peak hour trips (230 inbound and 130 outbound).

5. Modera Melrose

The Modera Melrose project is a project that includes 280 apartment units and 10,000 square feet of commercial retail space. The project is located at the southeast corner of the Melrose Drive and Bobier Drive intersection. The project would generate 2,880 ADT with 182 AM peak hour trips (56 inbound and 136 outbound) and 271 PM peak hour trips (166 inbound and 105 outbound).

9.2 Cumulative Projects Trip Generation

The above cumulative projects are estimated to generate a total of 8,543 trips, with 611 AM peak hour trips (219 inbound and 392 outbound) and 770 PM peak hour trips (474 inbound and 296 outbound). ***Table 9–1*** tabulates the total cumulative project traffic generation

Figure 9–1 depicts the Cumulative Projects AM/PM peak hour traffic volumes. ***Figure 9–2*** depicts the Existing + Cumulative Projects AM/PM peak hour traffic volumes. ***Figure 9–3*** depicts the Existing + Project + Cumulative Projects AM/PM peak hour traffic volumes.

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Projects	Land Use	Quantity		ADT	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
1. North Santa Fe Plaza Apartments	Apartments	19	DU	114	2	7	9	7	3	10
	Coffee Shop[b]	0.76	KSF	532	16	11	27	19	18	37
2. Alliance North Santa Fe	Apartments	60	DU	360	6	23	29	22	10	32
3. Vista Marketplace Expansion	Retail[c]	4.98	KSF	598	14	10	24	30	30	60
4. Melrose Heights	Mixed-Use	313	DU	4,059	125	215	340	230	130	360
5. Modera Melrose	Commercial /Retail	10	KSF	1,200	29	19	48	60	60	120
	Apartments	280	DU	1,680	27	107	134	106	45	151
TOTAL				**8,543**	**219**	**392**	**611**	**474**	**296**	**770**

Footnotes:

a. Rate is based on *SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.
b. Rate used: Fast food without drive thru
c. Rate used: Neighborhood shopping center

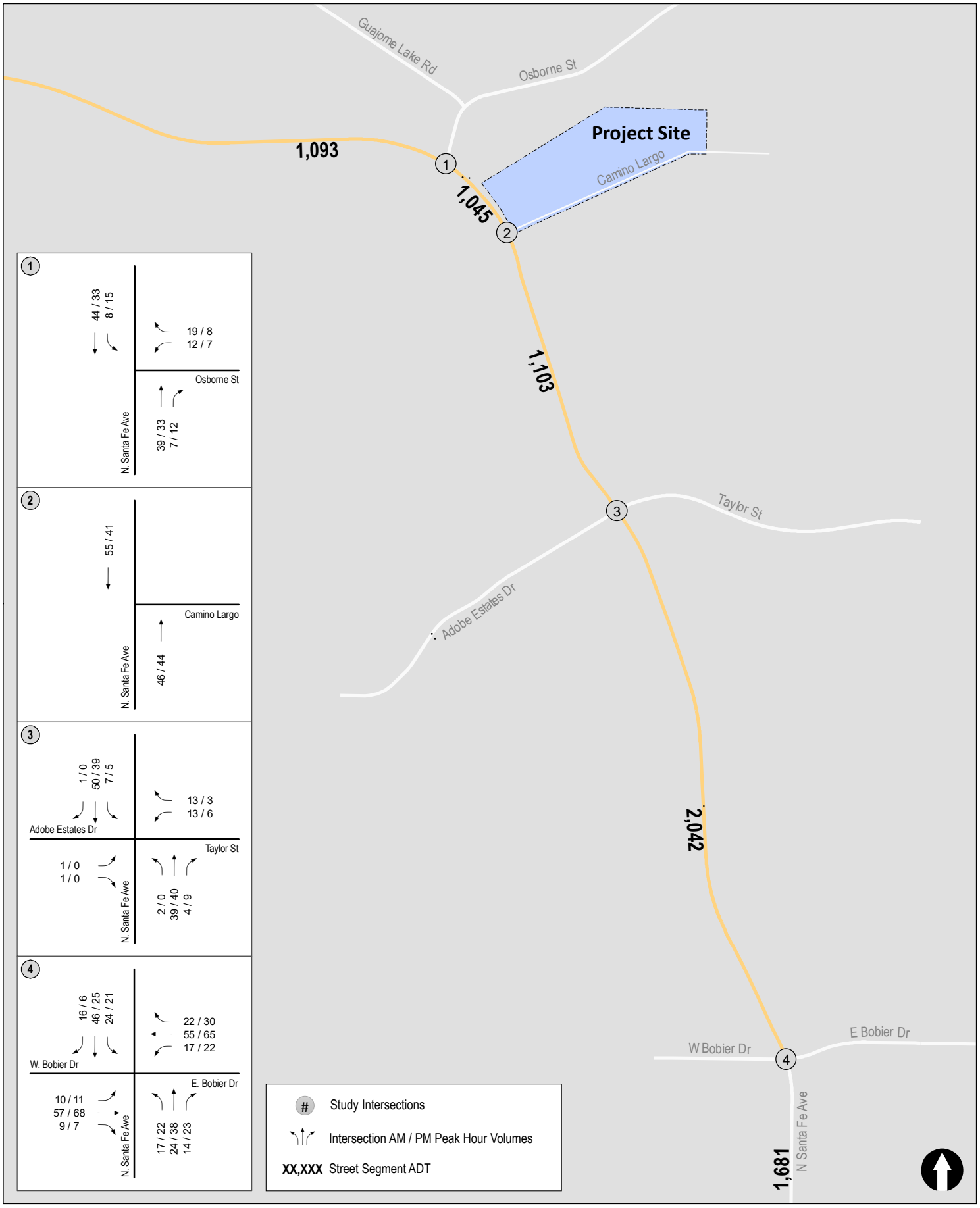

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Figure 9-1

Cumulative Projects Traffic Volumes

Camino Largo

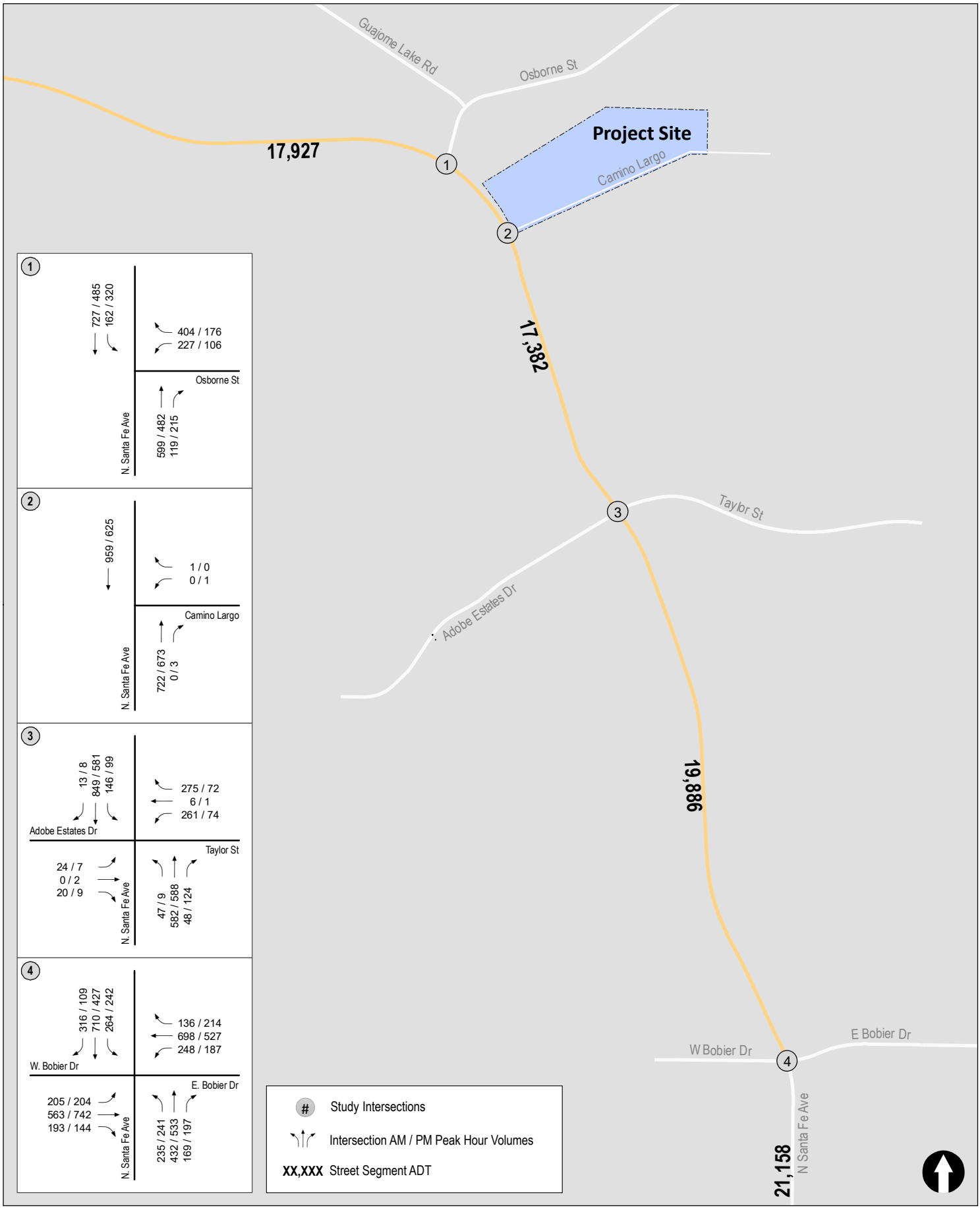

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Figure 9-2

Existing + Cumulative Projects Traffic Volumes

Camino Largo

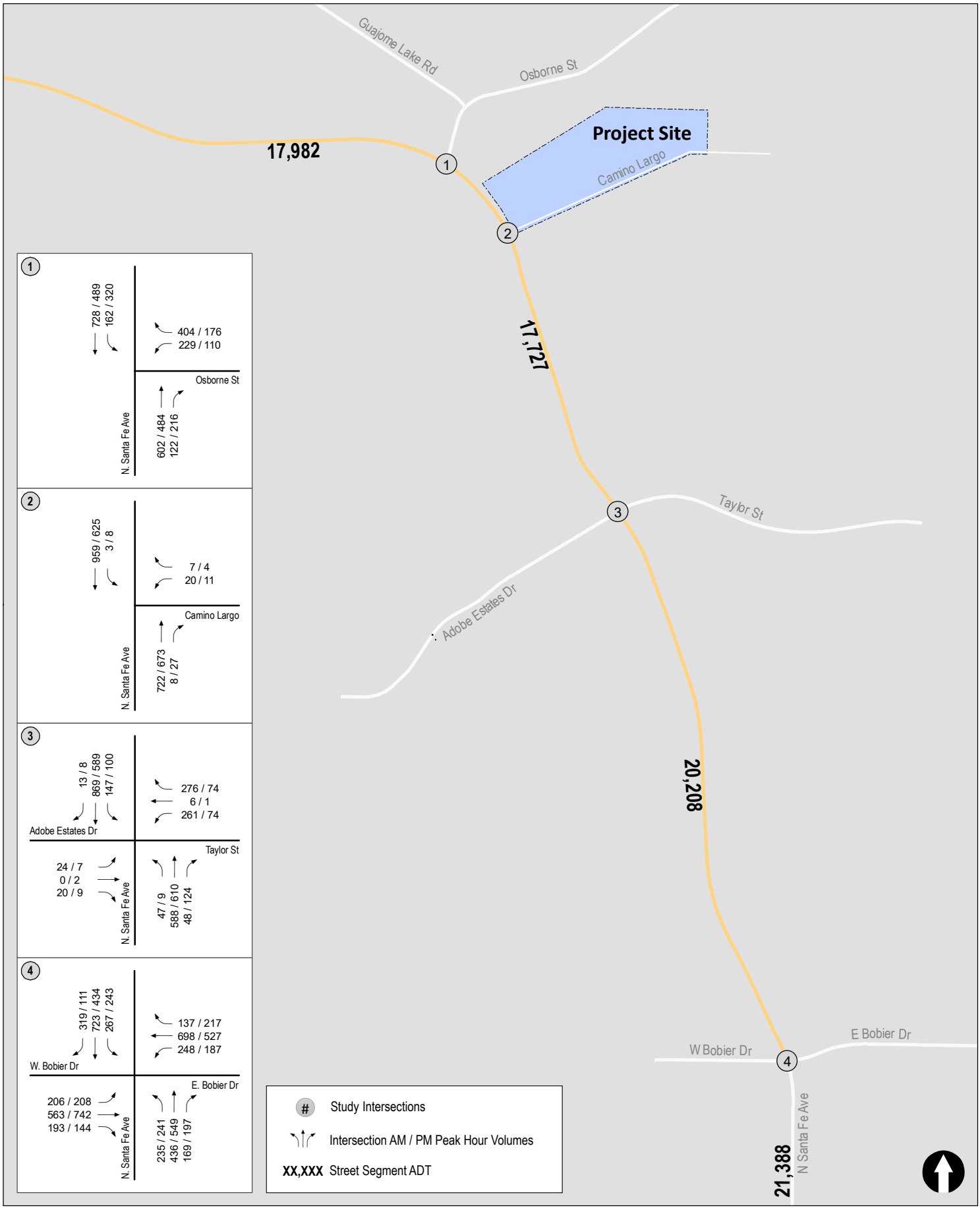

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Figure 9-3

Existing + Cumulative Projects + Project Traffic Volumes

Camino Largo

10.0 ANALYSIS OF EXISTING + CUMULATIVE PROJECTS SCENARIOS

10.1 Existing + Project Conditions

10.1.1 *Peak Hour Intersection Operations*

Table 10–1 summarizes the peak hour intersection operations under Existing + Project conditions. As seen in *Table 10–1*, with the addition of project traffic, the study intersections are calculated to continue to operate at LOS D or better during the AM and PM peak hours.

Appendix C contains the intersection analysis worksheets.

10.1.2 *Daily Street Segment Operations*

Table 10–2 summarizes the Existing + Project roadway segment operations. As seen in *Table 10–2*, with the addition of project traffic the study segments are calculated to continue to operate at LOS C on a daily basis with the exception of the following segments which are calculated to currently operate at LOS F:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo
- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

It is important to note that per City guidelines and as previously discussed in Section 6, intersection performance rather than segment performance is more accurate and a better indicator of true traffic operations and therefore intersections are used as the basis for defining traffic impacts.

10.2 Existing + Cumulative Projects without Project Conditions

10.2.1 *Peak Hour Intersection Operations*

Table 10–1 summarizes the Existing + Cumulative Projects without project traffic peak hour intersection operations. *Table 10–1* shows that in the Existing + Cumulative Projects without Project, the study intersections are calculated to continue to operate at LOS C or better during the AM and PM peak hours with the exception of the following intersection:

- **N Santa Fe Ave & Bobier Dr – LOS E (AM/PM)**

Appendix D contains the intersection analysis worksheets.

10.2.2 *Daily Street Segment Operations*

Table 10–2 summarizes the Existing + Cumulative Projects roadway segment operations. As seen in *Table 10–2*, with the addition of cumulative projects traffic, the study segments are calculated to continue to operate at LOS D on a daily basis with the exception of the following segments which are calculated to currently operate at LOS F:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo

- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

10.3 Existing + Cumulative Projects + Project Conditions

10.3.1 *Peak Hour Intersection Operations*

Table 10–1 summarizes the Existing + Cumulative Projects with Project traffic peak hour intersection operations. *Table 10–1* shows that in the Existing + Cumulative Projects with Project traffic, the study intersections are calculated to continue to operate at LOS C or better during the AM and PM peak hours with the exception of the following intersection:

- N Santa Fe Ave & Bobier Dr – LOS E (AM/PM)

The increase in delay due with the addition of project traffic is not greater than 2.0 seconds in either the AM or PM peak hour. Therefore, the addition of project traffic does not create a substantial effect.

Appendix E contains the intersection analysis worksheets.

10.3.2 *Daily Street Segment Operations*

Table 10–2 summarizes the Existing + Cumulative Projects with Project traffic roadway segment operations. As seen in *Table 10–2*, in the Existing + Cumulative Projects with Project traffic the study area street segments are calculated to continue to operate at LOS D on a daily basis with the exception of the following segments which are calculated to currently operate at LOS F:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo
- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

It is important to note that per City guidelines and as previously discussed in Section 6, intersection performance rather than segment performance is more accurate and a better indicator of true traffic operations and therefore intersections are used as the basis for defining traffic impacts.

TABLE 10–1
EXISTING + CUMULATIVE PROJECTS INTERSECTION ANALYSIS

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ[c]	Existing + Cumulative Projects without Project		Existing + Cumulative Projects with Project		Δ
			Delay[a]	LOS[b]	Delay	LOS		Delay	LOS	Delay	LOS	
1. N Santa Fe Ave / Osborne St	Signalized	AM	23.5	C	23.7	C	0.2	28.5	C	28.6	C	0.1
		PM	15.0	B	15.1	B	0.1	16.8	B	16.9	B	0.1
2. N Santa Fe Ave / Camino Largo	TWSC [d]	AM	13.6	B	20.7	C	7.1	14.2	B	22.2	C	8.0
		PM	16.5	C	16.5	C	0.0	17.4	C	17.5	C	0.1
3. N Santa Fe Ave / Taylor St	Signalized	AM	29.9	C	30.2	C	0.3	32.9	C	33.2	C	0.3
		PM	17.2	B	17.6	B	0.4	18.1	B	18.7	B	0.6
4. N Santa Fe Ave / Bobier Dr	Signalized	AM	50.1	D	50.7	D	0.6	56.3	E	57.0	E	0.7
		PM	46.9	D	47.9	B	1.0	55.7	E	57.0	E	1.3

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

c. Increase in delay due to Project traffic in seconds.

d. TWSC= Two-Way Stopped Controlled. Worst delay reported.

SIGNALIZED		UNSIGNALIZED	
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 10–2
EXISTING + CUMULATIVE PROJECTS STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Existing			Existing + Project				Existing + Cumulative Projects without Project			Existing + Cumulative Projects with Project			
		ADT[b]	LOS[c]	V/C[d]	ADT	LOS	V/C	Δ[e]	ADT	LOS	V/C	ADT	LOS	V/C	Δ[e]
N Santa Fe Avenue															
North of Osborne Street	25,000	16,834	B	0.673	16,889	B	0.676	0.003	17,927	C	0.717	17,982	C	0.719	0.002
Osborne Street to Camino Largo	15,000	15,120	F	1.008	15,235	F	1.016	0.008	16,165	F	1.078	16,280	F	1.085	0.007
Camino Largo to Taylor Street	15,000	16,279	F	1.085	16,624	F	1.108	0.023	17,382	F	1.159	17,727	F	1.182	0.023
Taylor Street to Bobier Drive	15,000	17,844	F	1.190	18,166	F	1.211	0.021	19,886	F	1.326	20,208	F	1.347	0.021
South of Bobier Drive	25,000	19,477	C	0.779	19,707	C	0.788	0.009	21,158	D	0.846	21,388	D	0.856	0.010

Footnotes:

a. The capacity of the roadway at Level of Service E
b. Average Daily Traffic
c. Level of Service
d. Volume to Capacity ratio
e. Increase in V/C ratio due to the addition of project traffic.

11.0 ANALYSIS OF HORIZON YEAR SCENARIOS

11.1 Horizon Year Baseline Conditions & Traffic Volumes

In order to forecast future traffic volumes for Horizon Year conditions, per the City's guidelines, the SANDAG Series 14 Model was utilized. The project traffic volumes were added onto the Horizon Year (Year 2050) Baseline scenario to develop Horizon Year (Year 2050) with Project traffic volumes. For the purposes of the 2050 analysis, no roadway network improvements were assumed.

Figure 11–1 shows the Horizon Year without Project traffic volumes. ***Figure 11–2*** shows the Horizon Year + Project traffic volumes.

11.2 Horizon Year Conditions

11.2.1 *Peak Hour Intersection Operations*

Table 11–1 summarizes the peak hour intersection operations under the Horizon Year conditions. As seen in *Table 11–1,* the study intersections are calculated to operate at LOS D or better during the AM and PM peak hours with the exception of the following intersections:

- N Santa Fe Ave & Osborne Street – LOS E (AM)
- N Santa Fe Ave & Taylor Street – LOS E (AM)
- N Santa Fe Ave & Bobier Dr – LOS E/F (AM/PM)

Appendix F contains the intersection analysis worksheets.

11.2.2 *Daily Street Segment Operations*

Table 11–2 summarizes the Horizon Year roadway segment operations. As seen in *Table 11–2*, the study segments are calculated to operate at LOS D on a daily basis with the exception of the following segments which are calculated to operate at LOS F:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo
- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

11.3 Horizon Year with Project Conditions

11.3.1 *Peak Hour Intersection Operations*

Table 11–1 summarizes the Horizon Year with Project traffic peak hour intersection operations. ***Table 11–1*** shows that in the Horizon Year with Project traffic, the study intersections are calculated to continue to operate at LOS D or better during the AM and PM peak hours with the exception of the following intersections:

- N Santa Fe Ave & Osborne Street – LOS E (AM)
- N Santa Fe Ave & Taylor Street – LOS E (AM)
- N Santa Fe Ave & Bobier Dr – LOS E/F (AM/PM)

The increase in delay due with the addition of project traffic is not greater than 2.0 seconds in either the AM or PM peak hour. Therefore, the addition of project traffic does not create a substantial effect.

Appendix G contains the intersection analysis worksheets.

11.3.2 *Daily Street Segment Operations*

Table 11–2 summarizes the Horizon Year roadway segment operations. As seen in ***Table 11–2***, with the addition of projects traffic, the study segments are calculated to continue to operate at LOS D on a daily basis with the exception of the following segments which are calculated to currently operate at LOS F:

- N Santa Fe Avenue: Between Osborne Street and Camino Largo
- N Santa Fe Avenue: Between Camino Largo and Taylor Street
- N. Santa Fe Avenue: Between Taylor Street and Bobier Drive

It is important to note that per City guidelines and as previously discussed in Section 6, intersection performance rather than segment performance is more accurate and a better indicator of true traffic operations and therefore intersections are used as the basis for defining traffic impacts.

TABLE 11–1
HORIZON YEAR INTERSECTION ANALYSIS

Intersection	Control Type	Peak Hour	Horizon Year		Horizon Year + Project		Δ[c]
			Delay[a]	LOS[b]	Delay	LOS	
1. N Santa Fe Ave / Osborne St	Signalized	AM	58.8	E	59.2	E	0.4
		PM	27.3	C	27.4	C	0.1
2. N Santa Fe Ave / Camino Largo	TWSC [d]	AM	25.3	D	34.4	D	9.1
		PM	21.9	C	25.0	C	3.1
3. N Santa Fe Ave / Taylor St	Signalized	AM	63.5	E	65.0	E	1.5
		PM	27.8	C	30.6	C	2.8
4. N Santa Fe Ave / Bobier Dr	Signalized	AM	71.6	E	72.3	E	0.7
		PM	81.5	F	82.9	F	1.4

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

c. Increase in delay due to Project traffic in seconds.

d. TWSC= Two-Way Stopped Controlled. Worst delay reported.

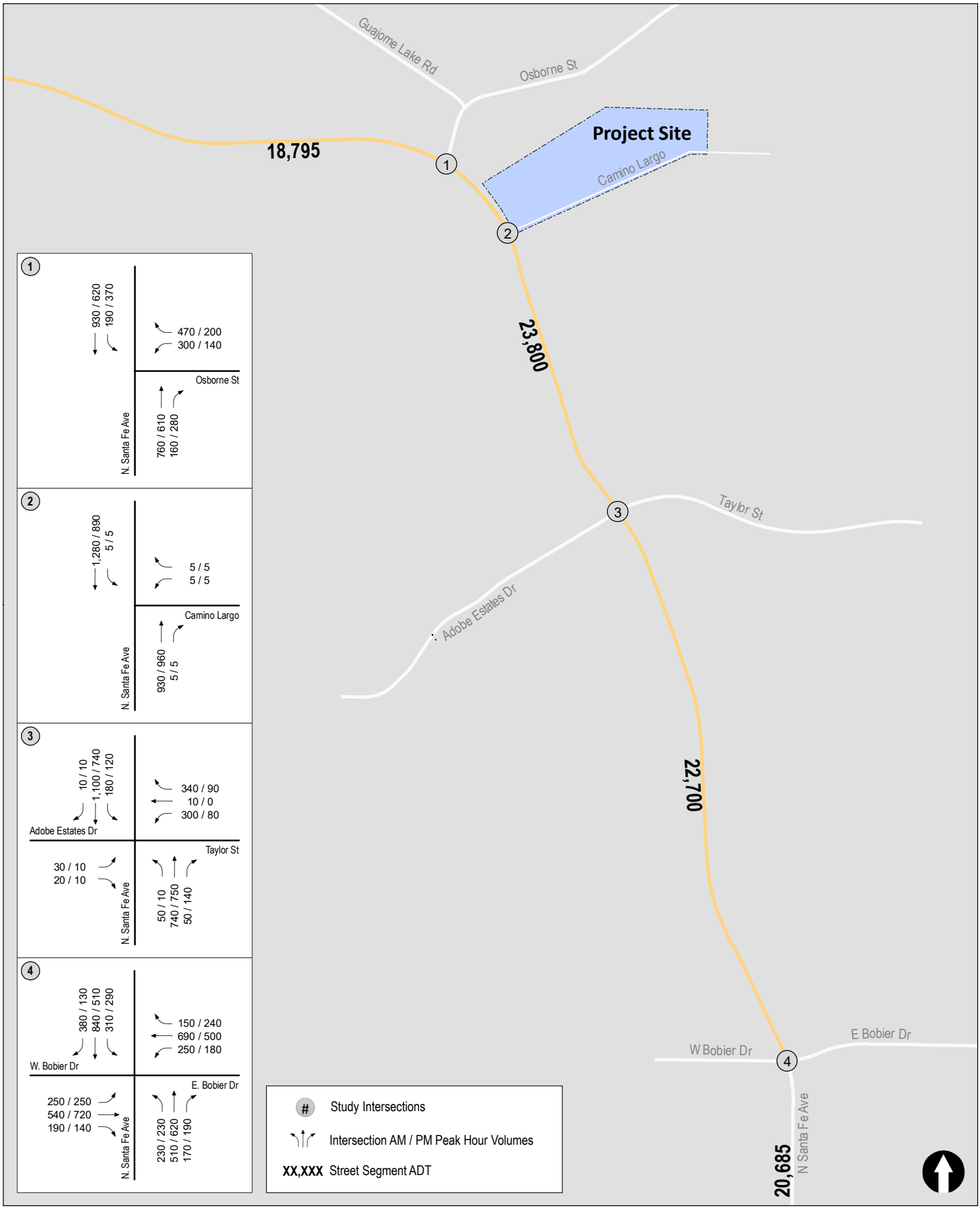
SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 11–2
HORIZON YEAR STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Horizon Year			Horizon Year + Project			
		ADT[b]	LOS[c]	V/C[d]	ADT	LOS	V/C	Δ[e]
N Santa Fe Avenue								
North of Osborne Street	25,000	18,795	C	0.752	18,850	C	0.754	0.002
Osborne Street to Camino Largo	15,000	23,900	F	1.593	24,015	F	1.601	0.008
Camino Largo to Taylor Street	15,000	23,800	F	1.587	24,145	F	1.610	0.023
Taylor Street to Bobier Drive	15,000	22,700	F	1.513	23,022	F	1.535	0.022
South of Bobier Drive	25,000	20,685	D	0.827	20,915	D	0.837	0.010

Footnotes:

a. The capacity of the roadway at Level of Service E
b. Average Daily Traffic
c. Level of Service
d. Volume to Capacity ratio
e. Increase in V/C ratio due to the addition of project traffic.



LINSCOTT LAW & GREENSPAN engineers

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Figure 11-1

Horizon Year Traffic Volumes

Camino Largo

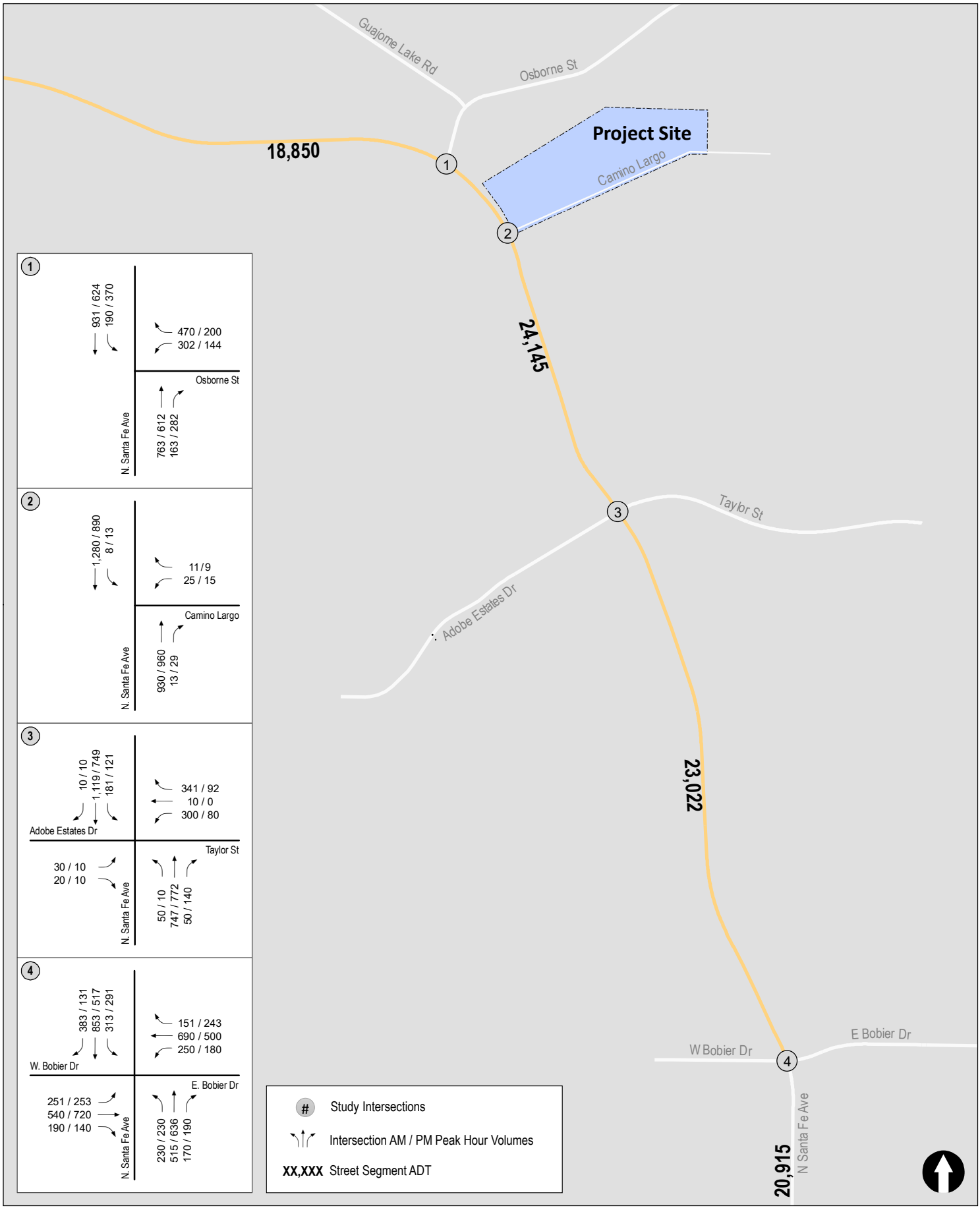

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Figure 11-2

Horizon Year + Project Traffic Volumes

Camino Largo

12.0 SITE ACCESS

Full access to the project site is provided along Camino Largo as shown in *Figure 2-3*, Conceptual Site Plan. A two-way left turn-lane is present along N Santa Fe Avenue at Camino Largo and allows for southbound left turns into the project site outside the southbound through movement. The two-way left-turn lane along N Santa Fe Avenue also facilitates outbound left turns from Camino Largo by providing a refuge lane and enabling drivers to only need to cross one direction of traffic at a time.

The intersection analysis at the Camino Largo / N Santa Fe intersection results in LOS C or better in all scenarios. The presence of the two-way left-turn lane and the acceptable LOS results leads us to determine that no improvements are deemed necessary. It is recommended that a stop sign be installed on Camino Largo at N Santa Fe Avenue.

13.0 PEDESTRIAN, BICYCLE AND TRANSIT

13.1 Pedestrian Mobility

Sidewalks are provided intermittently along N Santa Fe Avenue. There is an existing sidewalk on the east side of the street 300 feet north of N. Paseo Marguerita to about 330 feet south of Taylor Street. There is also an existing sidewalk on the west side of the street between Museum Way to Bobier Drive. According to the City of Vista's 2030 General Plan, Chapter 3: Circulation Element, a future pedestrian facility is planned on N. Santa Fe Avenue from Bobier Drive to the northern city boundary.

Taylor Street has a contiguous sidewalk on both the north and south sides of the street. Bobier Drive also has a contiguous sidewalk on both the north and south sides of the street. Camino Largo and Osborne Street have no sidewalks.

13.2 Bicycle Mobility

No bicycle facilities are provided on N. Santa Fe Avenue in the Project vicinity between Osborne Street and Bobier Drive. A Class II bikeway does exist on N. Santa Fe Avenue south of Bobier Drive for 1.5 miles. A future bike lane is proposed in the City of Vista's 2030 General Plan, Chapter 3: Circulation Element on N. Santa Fe Avenue between Bobier Drive northward to the Oceanside City limit.

No bicycle facilities are provided on Taylor Street in the Project vicinity. There is a planned bike lane on Taylor Street between N. Santa Fe Avenue and E. Vista Way.

Bicycle lanes are provided on Bobier Drive in both the eastbound and westbound directions in the Project vicinity.

13.3 Transit Mobility

Transit service in Vista is provided by North County Transit District. There are currently two (2) bus routes #303 and #318 serving in the project vicinity.

Route 303 is a High Frequency Route that travels between the Oceanside Transit Center and the Vista Transit Center via Town Center North. Route 303 traverses along N Santa Fe Avenue in the study area. Service is Monday through Sunday with frequencies of 30 minutes.

Route 318 travels between the Oceanside Transit Center and the Vista Transit Center via Oceanside Boulevard and Bobier Drive. Route 318 traverses along Bobier Drive in the study area. Service is Monday through Sunday with frequencies of 30 minutes.

14.0 CONCLUSION

Based on the analysis in this report, the Project does not result in any transportation deficiencies and hence no improvements are required.

As discussed in *Section 4.0*, the project is screened out from needing to conduct a VMT analysis and no significant CEQA transportation impact would occur.

A stop sign is recommended to be installed on Camino Largo at N Santa Fe Avenue intersection.