Torrey Meadows Drive Overcrossing at State Route 56 Project

Noise Study Report

Prepared For:

City of San Diego
Development Services Department
1222 1st Avenue
San Diego, CA 92101

Prepared By:

HELIX Environmental Planning, Inc.
7578 El Cajon Blvd., Suite 200
La Mesa, CA 91942

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SUMMARY

HELIX Environmental Planning, Inc. (HELIX) conducted a noise barrier analysis to assess potential noise impacts associated with construction of the proposed Project and to determine if existing noise barriers along Torrey Meadows Drive and related streets could protect adjacent homes from increases in traffic noise resulting from increased traffic volumes related to the proposed Project. The proposed Project would construct a bridge connecting Torrey Meadows Drive over State Route 56 (SR-56), and providing a secondary access between the communities located south and north of SR-56.

The analysis was based on information from a traffic study prepared for the Project (Urban Systems Associates, Inc., 2014) as well as aerial photographs showing the existing wall segments and a visit to verify noise barrier conditions.

The areas most susceptible to future increases in traffic were determined to include the residences along Torrey Meadows Drive and Torrey Santa Fe Road. With the connection provided by the proposed bridge, traffic volumes on Torrey Meadows Drive by the year 2035 would increase to 3,200 Average Daily Traffic (ADT), between SR-56 and Via Fortezza, 8,300 ADT between Via Fortezza and Camino del Sur, and 4,000 ADT between SR-56 and Torrey Santa Fe Road. Traffic on Torrey Santa Fe Road, between Torrey Meadows Road and the future main access to Santa Fe Summit, would increase to 7,035 ADT.

Noise walls currently exist on the north and south side of Torrey Meadows Drive, and along Torrey Santa Fe Road. Based on the noise analysis, these walls would maintain exterior noise levels along the affected roadways within the City of San Diego Land Use exterior noise limit of 65 CNEL for residences despite the increase in traffic which would result from the bridge connection. Thus, the increase in traffic noise along these roadways would not adversely affect exterior areas of adjacent residences.

Construction of the proposed Project could affect nearby residences. However, implementation of standard best management practices would minimize construction noise.

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List of Abbreviated Terms

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of San Diego
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
EIR	Environmental Impact Report
FHWA	Federal Highway Administration
Hz	Hertz
HT	heavy-duty trucks
I	Interstate
kHz	kilohertz
L_{DN}	Day-Night Level
L_{EQ}	Equivalent Sound Level
$L_{EQ}(h)$	Equivalent Sound Level over one hour
L_{max}	Maximum Sound Level
LOS	level of service
LT	long-term
L_{xx}	Percentile-Exceeded Sound Level
mPa	micro-Pascals
mph	miles per hour
MT	medium-duty truck
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NSR	noise study report
Protocol	Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
R/W	right-of-way

SPL	sound pressure level
SR	State Route
ST	short-term
TCEs	Temporary Construction Easements
TeNS	Technical Noise Supplement (Caltrans)
TNM 2.5	FHWA Traffic Noise Model Version 2.5
U.S.	United States
vph	vehicles per hour

Chapter 1. Introduction

The Torrey Meadows Drive Overcrossing Project (Project) is the construction of the Torrey Meadows Bridge, which would connect Torrey Meadows Drive over State Route 56 (SR-56) in the Torrey Highlands community of San Diego. The primary purpose of the proposed overcrossing is to improve traffic circulation in the community of Torrey Highlands. Currently, the portion of the community south of SR-56 has only one access in and out of the community via Torrey Santa Fe Road. As a consequence, this neighborhood experiences traffic congestion, difficult access to local facilities, and limited accessibility for bicycle and pedestrian access.

The Project is being proposed by the City of San Diego (City). Because construction of the overcrossing will be managed by the California Department of Transportation (Caltrans), the Project is also subject to Caltrans environmental review requirements.

This noise study assesses potential noise impacts which may result from construction and implementation of the proposed Project.

1.1 Purpose of the Noise Study Report

The purpose of the Noise Study Report (NSR) is to determine if changes in traffic volumes on local streets would adversely affect adjacent noise sensitive land uses. Connection of Torrey Meadows Drive across SR-56 would change the existing and future distribution of automobile trips on Torrey Meadows Drive and connecting roadways. As the residential development adjacent to the affected roadways already have noise barriers. The focus of the analysis was on determining whether these existing noise walls would be adequate to attenuate noise from increased traffic on Torrey Meadows Drive (north and south) of SR-56, and along Torrey Santa Fe Road, east of Torrey Meadows Drive in the City.

The City will fund the proposed Project but Caltrans will construct it. The Project would be subject to environmental review pursuant to the California Environmental Quality Act (CEQA). Environmental documentation pursuant to the National Environmental Policy Act (NEPA) would not be required, as the Project would not receive federal funds. The City is the lead agency under CEQA, and Caltrans District 11 serves as a Responsible Agency under CEQA.

1.2 Project Purpose and Need

Torrey Meadows Drive is a two-lane collector street that runs in a southwest to northeast direction. Currently, it is divided by SR-56, creating a cul-de-sac on each side of the highway. The portion of the community south of SR-56 has only one access in and out of the community via Torrey Santa Fe Road. As a consequence, this neighborhood experiences separation from the rest of the region, resulting in the following:

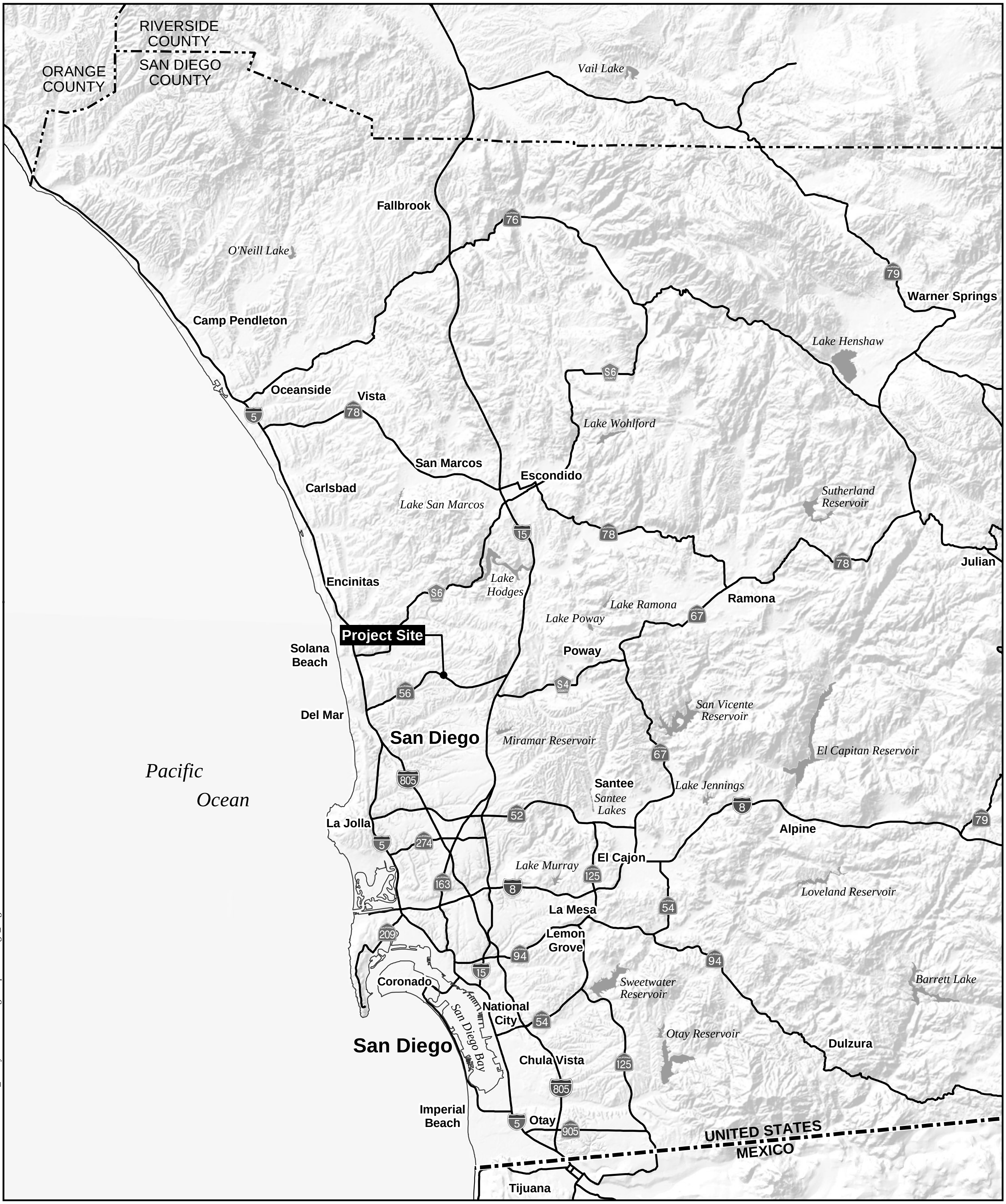
- Traffic congestion on Camino del Sur during the daily morning and evening peak hours, and increased traffic congestion at the SR-56/Camino del Sur Interchange;
- Difficult access to local schools, the neighborhood park, and the local mixed use area, with corresponding greater travel distances;
- A lack of pedestrian- and bicycle-oriented infrastructure, discouraging pedestrian and bicycle mobility; and
- Few traveling alternatives for disabled residents.

The proposed overcrossing would connect the two portions of Torrey Meadows Drive, thereby providing a second access and a better connection to the larger region, including the communities of Rancho Peñasquitos and Santaluz. The overcrossing is also intended to relieve existing and future traffic congestion at the Camino del Sur/SR-56 interchange by giving traffic a second option for traveling north and south of SR-56. Traffic congestion on the existing street network is expected to deteriorate when the region becomes fully developed. Camino del Sur is expected to reach or exceed its capacity in the future, as anticipated developments continue to be constructed, in accordance with the Torrey Highlands Subarea Plan. Improvements are needed to accommodate future traffic demands and relieve congestion on local streets.

In light of these mobility concerns, and to provide the infrastructure necessary to support continued local development, the City has mandated that Torrey Meadows Drive be extended across SR-56. The Torrey Highlands Public Facilities Financing Plan FY 2010 identifies the Torrey Meadows Drive (Street “B”) Overcrossing as Project T-9, with total funding of approximately $7.8 million.

Chapter 2. Project Description

As indicated earlier, the overcrossing would connect Torrey Meadows Drive over SR-56 in the Torrey Highlands community of the City (Figures 1 and 2). Although the overcrossing plans are in the preliminary design stage (Figures 3a and 3b), the work is expected to include construction of a two-lane bridge and related roadway approaches from the current termini of Torrey Meadows Drive. No ramps connections to SR-56 are proposed. The overcrossing would span SR-56 at approximately Post Mile 5.6.



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Regional Location Map

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

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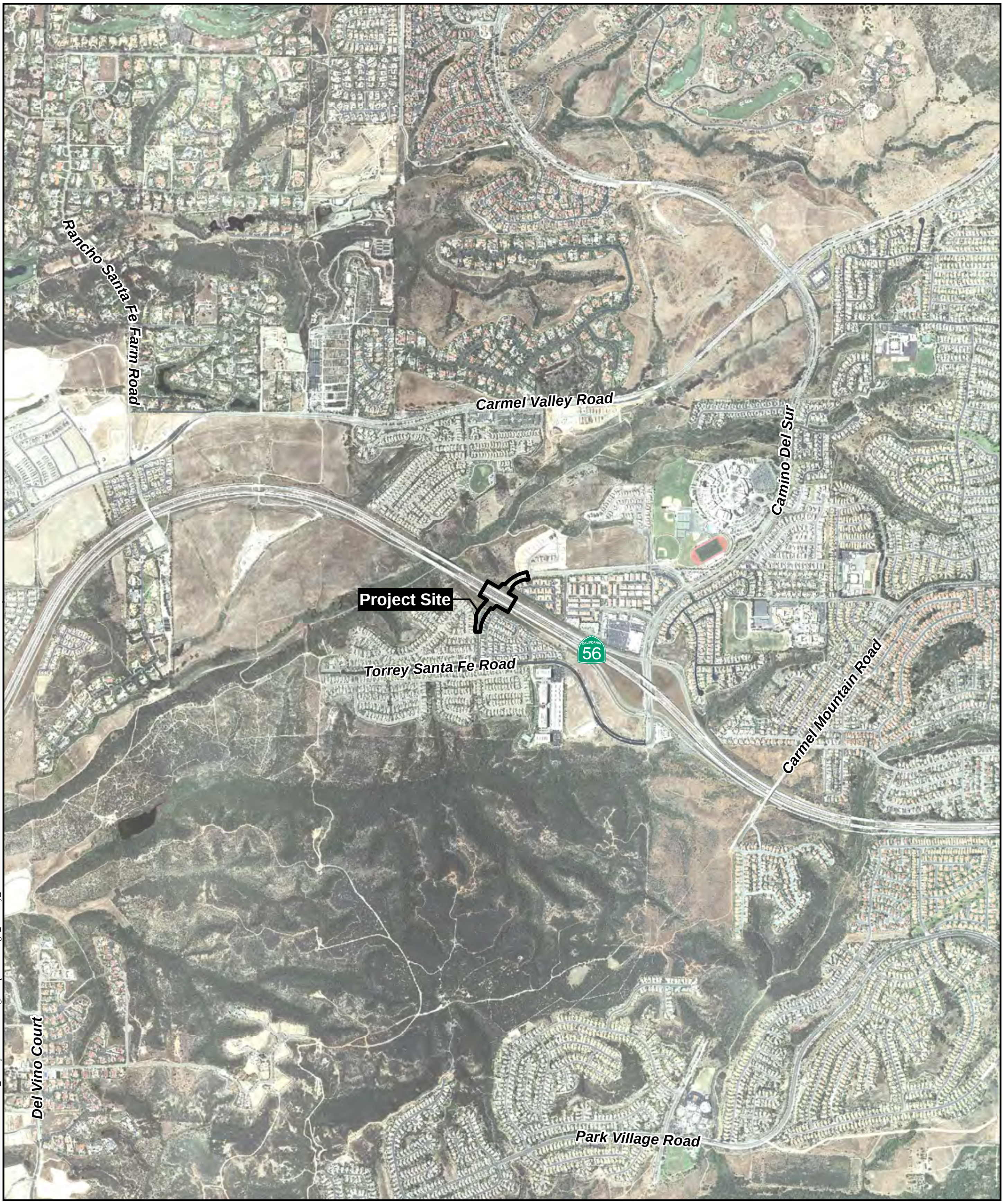
Figure 1



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Project Vicinity Map

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

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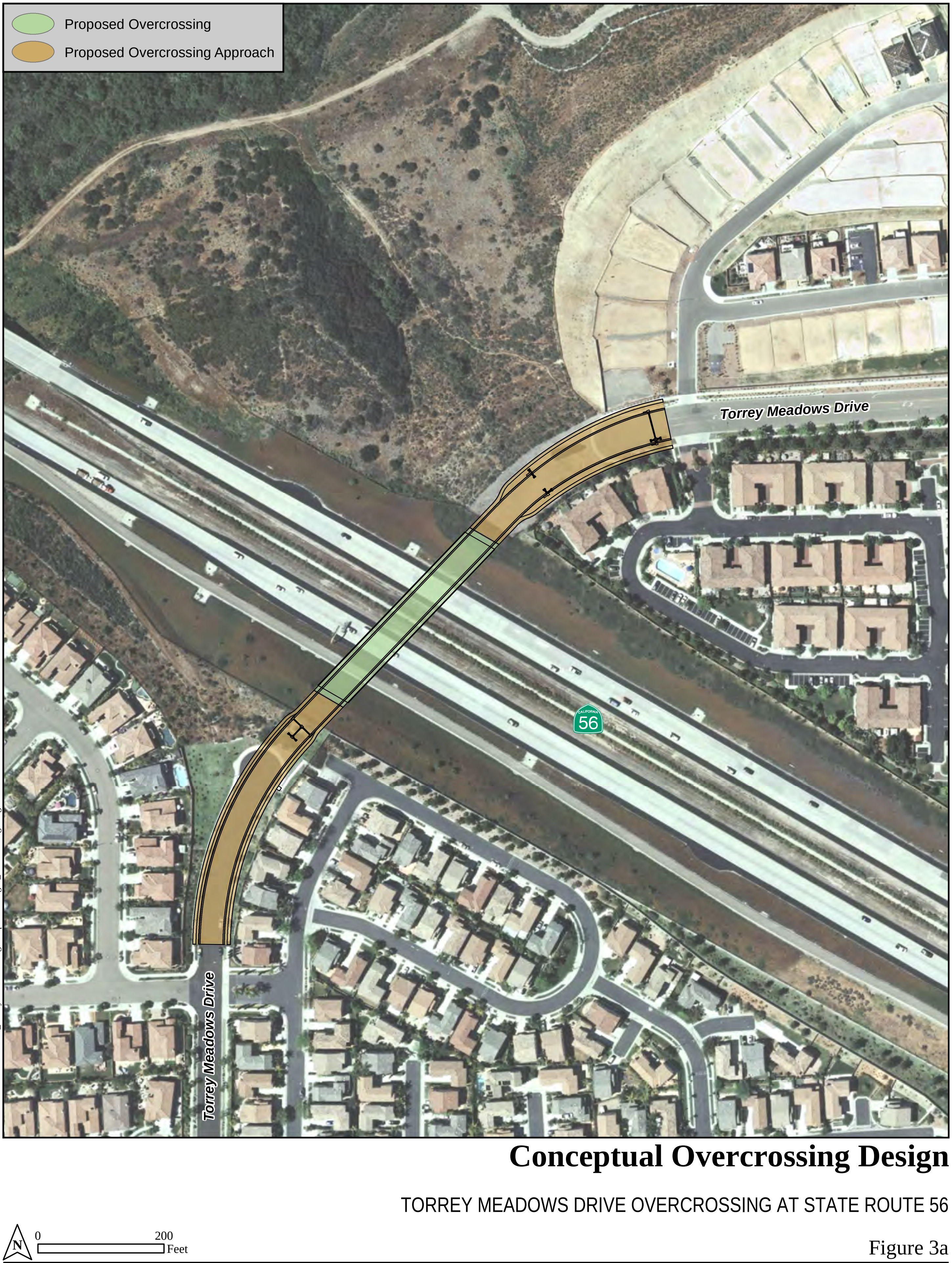
N 0 2,000 Feet

Figure 2



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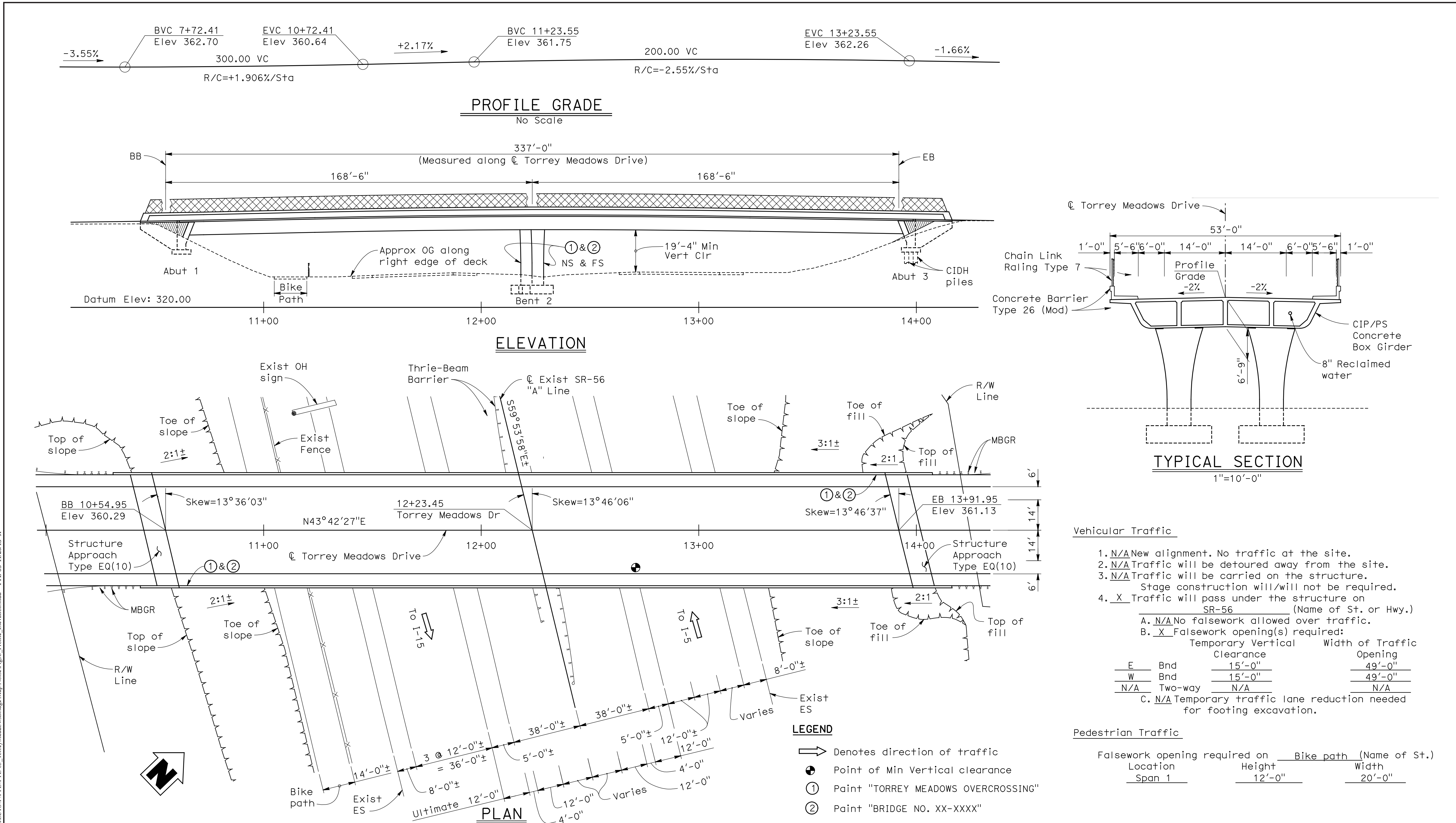
Conceptual Overcrossing Design

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

Figure 3a



Source: Caltrans 2013

Conceptual Overcrossing Profile Grade and Elevation

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

Figure 3b

The overcrossing would be a two-span, cast-in-place concrete structure supported by two columns in the SR-56 median. It would have a width of 54 feet and a length of 337 feet. The overcrossing would include a sidewalk in each direction. A concrete barrier with chain link fence would be located on the edges of the overcrossing. The approaches from Torrey Meadows Drive would be two-lane asphalt roadways with a sidewalk on each side.

The overcrossing would include a 16-inch water main that would connect to two existing 16-inch water mains in Torrey Meadows Drive on the north side of the bridge and the existing 8-inch water main on the south side of the bridge at the intersection of Torrey Meadows Drive and Primrose Lane. Construction of the bridge and approaches could require removal and/or replacement of one or more of the existing utility facilities (sewer, water, and storm drain) present on Torrey Meadows Drive (north and south of SR-56), and along SR-56.

Grading associated with the proposed overcrossing and roadway approaches is expected to be limited to 1.5 acres within the roadway right-of-way (R/W).

R/W has been dedicated on either side of SR-56 to accommodate the construction of the overcrossing; no permanent R/W acquisitions would be necessary to complete this project, but Temporary Construction Easements (TCEs) would likely be required to accommodate temporary impacts to SR-56, including impacts to a drainage ditch in the median and landscaping bordering the highway.

Project construction is anticipated to take approximately 18 months.

Chapter 3. Fundamentals of Traffic Noise

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS; Caltrans 1998, updated 2009), a technical supplement to the Protocol is available on the Caltrans website (www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf).

Noise is commonly defined as unwanted sound. Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB). Sound pressures in the environment have a wide range of values and the sound pressure level was developed as a convenience in describing this range as a logarithm of the sound pressure. The sound pressure level is the logarithm of the ratio of the unknown sound pressure to a reference quantity of the same kind.

To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). Typical A-weighted noise levels are listed in Table 3-1.

Table 3-1
TYPICAL A-WEIGHTED NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, at 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans (1998)

A given level of noise may be more or less tolerable depending on the sound level, duration of exposure, character of the noise sources, the time of day during which the noise is experienced, and the activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep may be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. For example, some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long-term basis.

Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are the Equivalent Energy Level (L_{EQ}), and the Community Noise Equivalent Level (CNEL).

L_{EQ}, the Equivalent Energy Level, is the average acoustical or sound energy content of noise, measured during a prescribed period, such as 1 minute, 15 minutes, 1 hour, or 8 hours. It is the decibel sound level that contains an equal amount of energy as a fluctuating sound level over a given period of time.

CNEL, Community Noise Equivalent Level, is the average equivalent A-weighted sound level over a 24-hour period. This measurement applies weights to noise levels during evening and nighttime hours to compensate for the increased disturbance response of people at those times. CNEL is the equivalent sound level for a 24-hour period with a +5 dBA weighting applied to all sound occurring between 7:00 p.m. and 10:00 p.m. and a +10 dBA weighting applied to all sound occurring between 10:00 p.m. and 7:00 a.m. Similar to the CNEL, L_{DN}, the day-night average noise level, is a 24-hour average L_{EQ} with a +10 dBA weighting applied to noise during the hours of 10:00 p.m. to 7:00 a.m. L_{DN} and CNEL are typically within 1 dBA of each other and, for most intents and purposes, are interchangeable.

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Sound that originates from a linear, or “line” source such as a heavily traveled traffic corridor, attenuates by approximately 3-dBA per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise. Other contributing factors that affect sound reception include meteorological conditions and the presence of manmade obstacles such as buildings and sound barriers. Factors that contribute to traffic noise include the number of vehicles, vehicle speed, the percentage of vehicles that are medium or heavy-duty trucks, roadway surface, median width, and whether the roadway is at the same elevation as the receptor.

Noise has a significant effect on the quality of life. An individual’s reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 5-dBA change in community noise levels is clearly noticeable, and a 3-dBA change is the smallest increment that is perceivable by most receivers. Generally, 1 to 2 dBA changes generally are not detectable. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: sleep disturbance, permanent hearing loss, human performance and behavior, social interaction of communication, extra-auditory health effects, and general annoyance.

Chapter 4. Regulations and Policies

4.1 California Department of Transportation

4.1.1 Caltrans Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

This Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. Table 4-1 summarizes noise abatement criteria (NAC) used in the Protocol corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

Table 4-1 ACTIVITY CATEGORIES AND NOISE ABATEMENT CRITERIA		
Activity Category	**NAC, Hourly A-Weighted Noise Level (dBA-L_{EQ}[h])[1]**	**Description of Activities**
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B[2]	67 Exterior	Residential.
C[2]	67 Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	N/A[3]	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	Undeveloped lands that are not permitted.

[1] The L_{EQ}(h) activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA).
[2] Includes undeveloped lands permitted for this activity category.
[3] No standard specified.

In identifying noise impacts, primary consideration is given to exterior areas of frequent human use. In situations where there are no exterior activities, or where the exterior activities are far from the roadway or physically shielded in a manner that prevents an impact on exterior activities, the interior criterion (Activity Category D) is used as the basis for determining a noise impact.

The Protocol defines a noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA. The Protocol also states that a sound level is considered to approach a NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The TeNS to the Protocol provides detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

4.2. City of San Diego

4.2.1. City of San Diego's CEQA Significance Determination Thresholds

The City's CEQA Significance Determination Thresholds (2011) provides guidance for the determination of traffic noise impacts. As indicated in Table 4-2, traffic noise increases over 3 dBA in areas where the traffic noise significance thresholds would be exceeded are considered significant.

Table 4-2
TRAFFIC NOISE SIGNIFICANCE THRESHOLDS
(dBA CNEL)

Structure or Proposed Use that Would be impacted by Traffic Noise	Interior Space[1]	Exterior Usable Space[1,2]	General Indication of Potential Significance
Single-family detached	45	65	Structure or outdoor usable area is less than 50 feet from the center of the closest (outside) land on a street with existing or future ADT[3] above 7,500
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	45	65	
Offices, churches, business, professional uses	N/A	70	Structure or outdoor usable area is less than 50 feet from the center of the closest lane on a street with existing or future ADTs above 20,000
Commercial, retail, industrial, outdoor spectator sport uses	N/A	75	Structure or outdoor usable area is less than 50 feet from the center of the closest lane on a street with existing or future ADTs above 40,000

Source: City 2011
[1] If a project is currently at or exceeds the significance thresholds for traffic noise and noise levels would result in a less than 3 dB increase, then the impact is not considered significant.
[2] Exterior usable space areas do not include residential front yards or balconies, unless the areas are a part of the required usable open space calculation for multi-family units.
[3] Average daily traffic
N/A = not applicable

4.2.2. City of San Diego's Noise Ordinance

City of San Diego Municipal Code, Chapter 5, Article 9.5, Division 4, § 59.5.0404 Construction Noise

Construction activity noise cannot exceed an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m. at or beyond the property lines of any property zoned residential.

Chapter 5. Study Methods and Procedures

The noise analysis for the Project was conducted in a manner consistent with the Caltrans Traffic Noise Analysis Protocol (Protocol), May 2011, and associated Technical Noise Supplement. The purpose of the Protocol is to present Caltrans policies and procedures for applying the federal Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) in California. The Protocol is supplemented by the Technical Noise Supplement, and contains Caltrans noise analysis procedures, practices, and other useful technical background information related to the analysis of highway noise impacts and abatement.

5.1. Methods for Identifying Land Uses and Selecting Noise Measurement and Modeling Receiver Locations

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed Project. Land uses that would be affected by traffic using the future Torrey Meadows Drive Bridge consist of single-family and multi-family residential uses on Torrey Santa Fe Road and Torrey Meadows Drive. A single community sports park is located near on the north side near the eastern end of Torrey Meadows Drive.

One short-term measurement (20 minutes in duration) and two long-term measurements (24 hours in duration) sites were selected to survey the existing noise environment. The results of these measurements are described below.

Measurement locations are shown in relation to the project site in Figure 4 and described in Table 5.1.

Table 5-1 AMBIENT NOISE MEASUREMENT LOCATIONS		
Number	**Location**	**Approximate Coordinates**
LT-1	Southern side of western cul-de-sac ending of Torrey Meadows Drive (north section) in a large bush adjacent to the widest section of the cul-de-sac.	32°48'37"N, 117° 09'33.25"W
LT-2	In a tree along the eastern side of Torrey Ranch Court adjacent to the sports park, approximately 120 feet north of the pavement edge of Torrey Meadows Drive.	32°57'29"N, 117° 08'27.63"W
ST-1	15 feet from the edge of the pavement on the north side of Torrey Santa Fe Road, 110 feet east of the edge of the pavement of Torrey Meadows Drive adjacent the low retaining wall.	32°57'36.11"N, 117° 09'39.29"W

ST = short term
LT = long term

5.2. Field Measurement Procedures

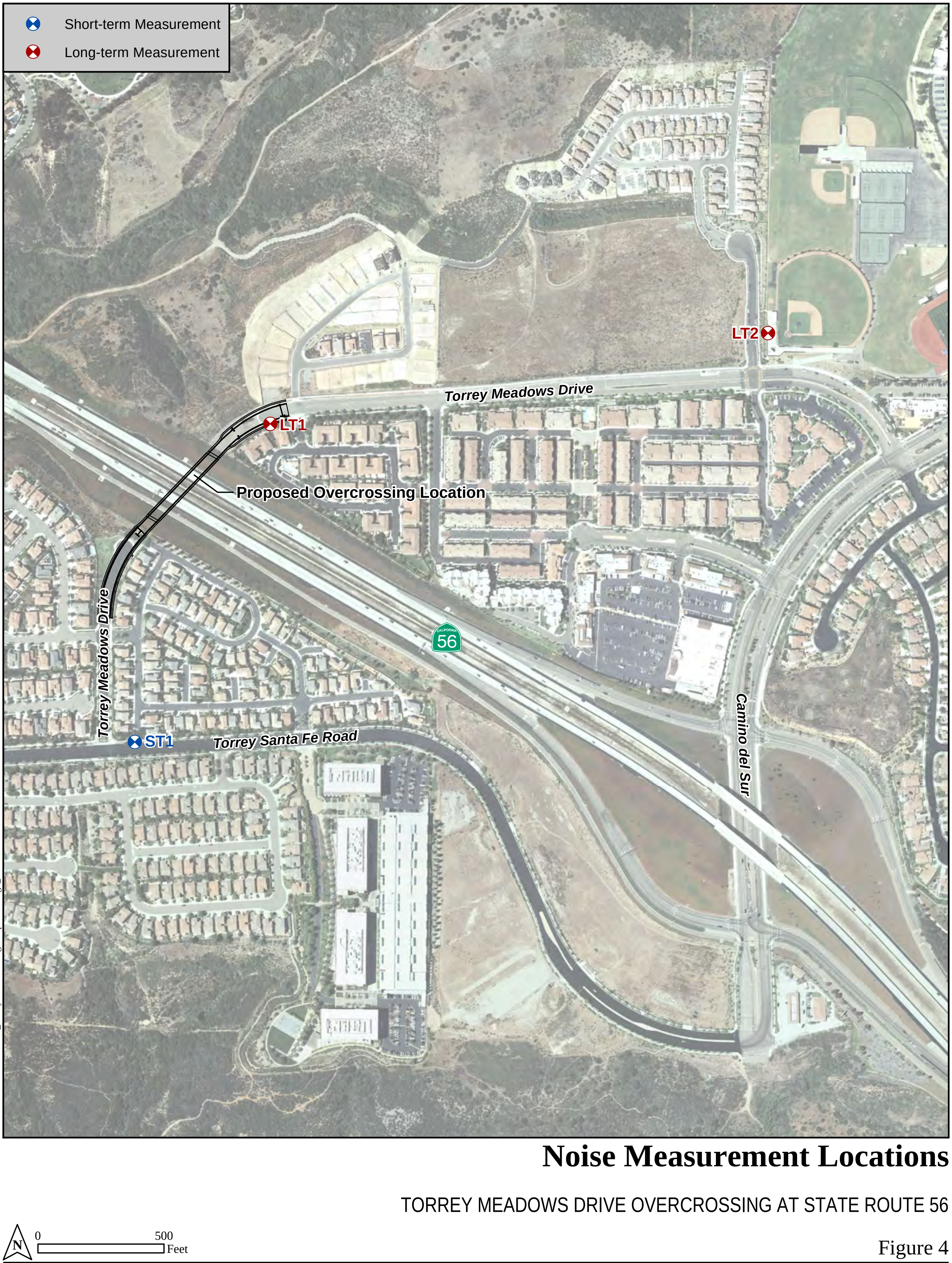
5.2.1. Short-term Measurements

A single short term (ST) measurement was taken on Wednesday, July 9, 2014 at 2:55 p.m. No noise sources other than normal roadway traffic were noted. During the 20-minute ST measurement, a count was taken of the passing cars on the roadway during the ST measurement. Vehicles were classified as automobiles, medium-duty trucks (MT), or heavy-duty trucks (HT). An automobile was defined as a vehicle with two axles and four tires that are designed primarily to carry passengers. Small vans and light trucks were included in this category. Medium-duty trucks included all cargo vehicles with two axles and six tires. Heavy-duty trucks included all vehicles with three or more axles. The posted speed on Torrey Santa Fe Road was 40 mph.

The ST measurement was made with a Larson-Davis Model 831 Precision Type 1 sound level meter (serial number 1390). The calibration of the meter was checked before and after the measurement using a Larson-Davis Model CA250 calibrator (serial number 34252-5).

5.2.2. Long-term Measurements

Both Long Term (LT) measurements were taken starting on Wednesday, July 9, 2014, at 3:00 p.m. The purpose of the measurement at LT-1 was to identify variations in sound levels throughout the day in an area which will be impacted by noise generated by the new bridge roadway which does not currently have any noise from Torrey Meadows Drive but is subject to



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Noise Measurement Locations

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

Figure 4

traffic noise fromSR-56. Measurement LT-2 was positioned adjacent to the sports field and away from any significant contribution from SR-56.

Both LT measurements were taken with a Larson-Davis Model 7020 sound level meters (serial numbers 0373 and 0370). The calibration of the meter was checked before and after the measurement using a Larson-Davis Model CA250 calibrator (serial number 4371).

5.3. Traffic Noise Levels Prediction Methods

Traffic noise levels were predicted using the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). Key inputs to the traffic noise model were the locations of roadways, shielding features (e.g., topography and buildings), existing noise barriers, ground type, and receivers. Three-dimensional representations of these inputs were developed using CAD drawings, aerial photographs, and topographic contours.

Worst-case (loudest hour) traffic noise typically occurs when traffic is free-flowing at full speed; this condition typically occurs at Level of Service (LOS) C. Under LOS C conditions, traffic is heavy, but remains free-flowing. The City of San Diego *Traffic Impact Study Manual* (July 1998) provides the traffic levels based on roadway capacities at different LOS for collector roadways. Both Torrey Meadows Drive and Torrey Santa Fe Road are classified as 2-lane collector streets with no fronting property, with a traffic capacity at LOS C of 7,500 ADT (Urban Systems Associates, Inc., May 2014). Camino del Sur is a 4-lane Major Arterial with an LOS C capacity of 30,000 ADT.

For the noise analysis, it was assumed that the loudest hour traffic represents 10 percent of the LOS C daily traffic capacity. Traffic speed at LOS C is assumed to be 40 miles per hour, which is the posted speed limit for the Torrey Santa Fe Road. Torrey Meadows Drive is posted as 25 mph for the southern segment, but is analyzed based on an assumed future 40 mph.

The model-calculated one-hour L_{EQ} noise output, with the use of 8 to 10 percent of the average daily traffic occurring during a peak hour, is the equivalent of the CNEL (Caltrans 2009).

Vehicle classification percentages used for modeling were obtained from averaging the vehicle classification percentage observations for medium trucks, heavy trucks and automobiles from the on-site short-term measurements. Based on observations, it was assumed that automobiles represent 98 percent of traffic and medium duty trucks consist of the remaining 2 percent.

Table 5-2 EXISTING AND FUTURE ROADWAY VOLUMES (ADT)					
Roadway Segment	**Existing**	**Existing + Project**	**2035**	**2035 + Project**	**LOS C**
Torrey Santa Fe Road					
Torrey Meadows Drive to Santa Fe Summit	2,947	5,247	3,800	7,000	7,500
Torrey Meadows Drive					
Torrey Santa Fe Road to SR-56	726	3,026	766	4,000[1]	7,500
SR-56 to Via Fortezza	726	3,026	766	3,200	7,500
Via Fortezza to Camino del Sur	726	3,026	766	8,300[1]	7,500
Camino del Sur					
North of Torrey Meadows Drive	20,424	20,424	23,700	23,700	30,000
Torrey Meadows Drive to Highland Village Place	21,940	19,640	26,300	23,100	30,000

Source: USA 2014.
[1] Based on personal communication with Justin Schlaefli, Urban Systems Associates Inc. (July 2014)

Chapter 6. Existing Noise Environment

6.1 Existing Land Uses

The noise-sensitive land uses that would be affected by the Project consist of single-family and multi-family residential uses on Torrey Santa Fe Road and Torrey Meadows Drive. A single community sports park is located near on the north side near the eastern end of Torrey Meadows Drive.

Noise walls currently exist on the north and south side of Torrey Meadows Drive. The existing wall, which is the lowest in height, is located along the north side of the street where it is approximately 5 feet in height. Noise walls also currently exist along Torrey Santa Fe Road, where the lowest wall is estimated to be 5 feet high on the south side of the street.

In addition to the noise walls, some of the areas have substantial topographic elements providing additional noise attenuation to the outdoor use area. The residences on the north side of Torrey Meadows Drive, east of Via Ambrosa are 10 to 15 feet below the level of the roadway. The 5-foot noise wall is located at the roadway grade. The residences on the south side of Torrey

Meadows Drive, between Via Ambrosa and Via Sabbia, are above grade, and include tiered retaining walls from 6 to 12 feet in height starting at the roadway grade. Noise control walls are also located on the top at the residential grade. East of Via Sabbia, the retaining walls increase in height from 12 to 22 feet but do not include a noise control wall at the top of the grade.

The residences to the north of Torrey Santa Fe Road, east of Torrey Meadows Drive, are all 5 to 10 feet uphill from the roadway, and include walls at the residential grade level. The residences on the south side of Torrey Santa Fe Road are between 5 to 15 feet below the roadway grade and include a wall at the roadway grade.

Specific topography for the roadways and the surrounding residential development was obtained using Lidar remote sensing data. The Lidar base data was converted to topographic contours and input into the TNM model.

6.2. Short-term Monitoring

Table 6-1 summarizes the results of the short-term measurement conducted in the Project area.

Table 6-1
SUMMARY OF SHORT-TERM AMBIENT NOISE MEASUREMENT

Site	Start Time	Duration	L_{EQ} (dBA)	Autos	Medium Trucks	Heavy Trucks
ST-1	2:55 pm	20 min	64.3	96	0	0

See Figure 4 for short-term measurement location.

6.3. Long-term Monitoring

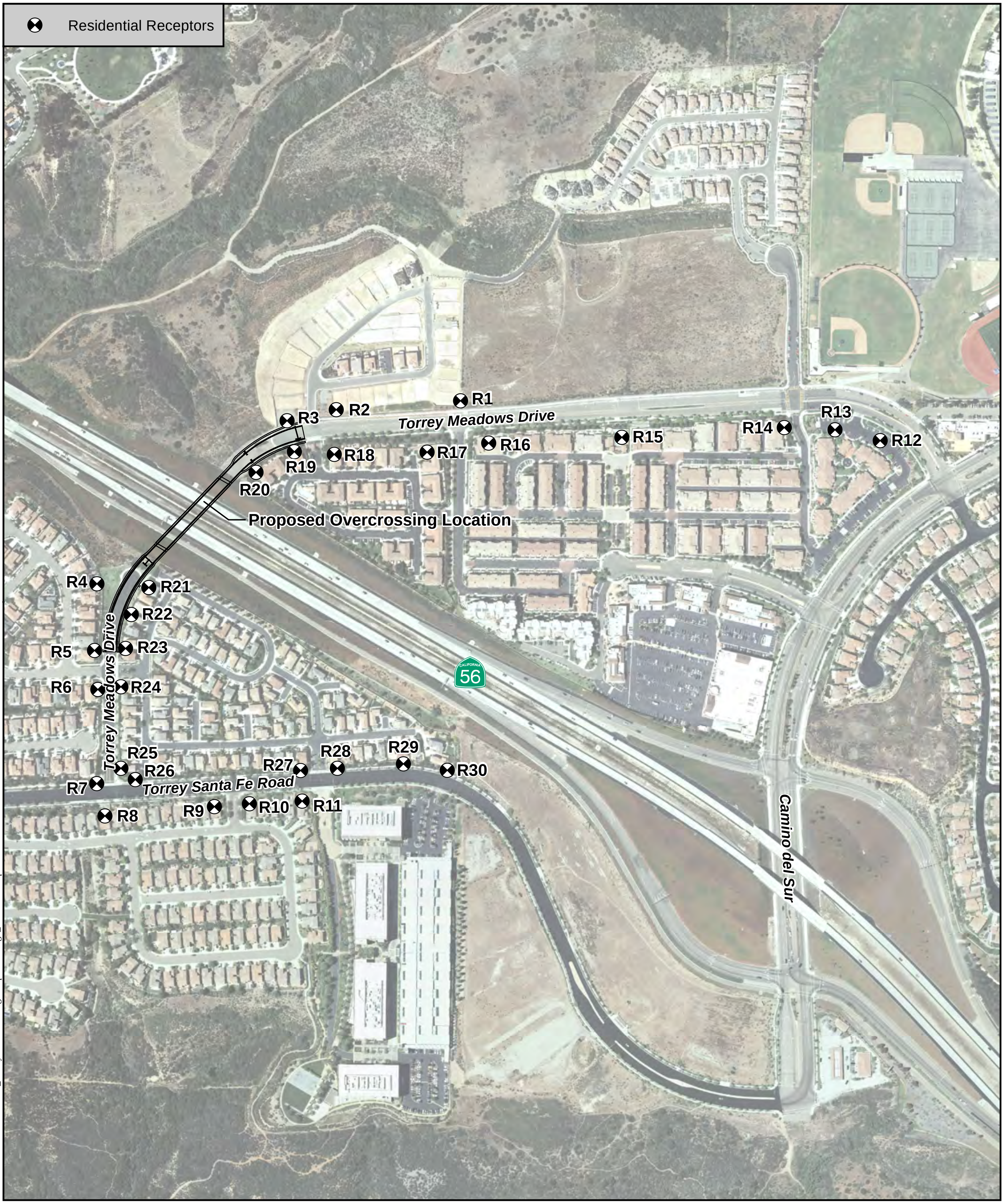
The results of the long-term monitoring results are shown in Table 6-2. The purpose of these measurements was to describe variations in sound levels throughout the day, rather than absolute sound levels at a specific receptor of concern.

Table 6-2 SUMMARY OF LONG-TERM MEASUREMENTS		
Start of Hour	**L_{EQ} (dBA)**	
	LT-1	**LT-2**
3:00 pm	54.1	59.0
4:00 pm	51.3	49.4
5:00 pm	54.4	57.9
6:00 pm	53.0	49.8
7:00 pm	52.2	47.8
8:00 pm	53.9	55.2
9:00 pm	52.4	55.3
10:00 pm	45.9	41.3
11:00 pm	40.9	37.0
12:00 am	39.9	34.1
1:00 am	38.5	34.0
2:00 am	35.1	33.2
3:00 am	33.8	33.0
4:00 am	44.5	37.5
5:00 am	45.9	39.8
6:00 am	53.2	44.7
7:00 am	50.9	51.3
8:00 am	54.6	61.3
9:00 am	48.9	50.9
10:00 am	51.4	51.8
11:00 am	54.2	61.4
12:00 pm	53.2	52.4
1:00 pm	56.7	63.3
2:00 pm	53.5	60.7

See Figure 4 for locations of long-term noise measurements.

6.4. Comparison of Measured Noise to TNM Model

TNM 2.5 was used to compare measured traffic noise levels to modeled noise levels at field measurement locations. The model calculated a noise level of 64.5 dBA where the actual measured noise level was 64.3 dBA. The 0.2 dBA variance is within 2 dB of the measured sound levels and is, therefore, considered to be in reasonable agreement with the measured sound levels. Therefore, no calibration of the noise model was necessary.



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Modeled Receptor Locations

TORREY MEADOWS DRIVE OVERCROSSING AT STATE ROUTE 56

N 0 500 Feet

Figure 5

Chapter 7. Future Noise Environment

This section discusses the predicted traffic noise level under existing and future buildout (2035) conditions (with and without the Project).

The noise analysis included an assessment of noise levels based on estimated traffic levels provided by the Traffic Impact Study (USA 2014). Although the bridge itself would not generate traffic, implementation of the bridge would reconfigure traffic patterns in the area compared to existing conditions. Correspondingly, traffic volumes would increase along Torrey Meadows Drive as it becomes a throughway to cross SR-56. Conversely, the Project would not result in any increases in traffic volumes along Camino del Sur compared to volumes without the Project (see Table 5-2)

As noted earlier, modeling of noise levels took into consideration topographic considerations and the existing noise walls located along the north and south side of Torrey Meadows Road and Torrey Santa Fe Road.

The noise analysis compared the change in noise levels between Existing and Existing + Project conditions. To assess project impacts using Caltrans criteria, future noise traffic noise levels were conservatively assessed using traffic volumes that would be expected under LOS C conditions (which is considered to be the highest volume of traffic that a roadway can support under free-flowing conditions). To assess project impacts using City criteria, future noise impacts are based on the 2035 plus project traffic volumes found in the traffic impact study. As shown in Table 5-2, predicted noise levels associated with the Project are expected to be lower than LOS C traffic levels. As a result, it was not necessary to compare future conditions without the Project.

The existing conditions noise is modeled as 10 percent of the existing traffic volume which provides both a reasonable worst case hourly noise level (Caltrans) and a direct equivalent to CNEL for the City of San Diego.

7.1. Predicted Noise Environment and Impacts

The following section summarizes the traffic noise modeling results for existing conditions and future (2035) conditions with and without the project. Traffic impacts are assessed using both Caltrans and City criteria for significance. The receiver locations are illustrated in Figure 5.

As discussed earlier, the existing and existing plus project traffic noise level scenarios are based on 10 percent of the traffic volumes as provided in the traffic report. Under this methodology, the resulting peak hour L_{EQ} and CNEL noise levels are essentially equivalent. However, the future buildout traffic noise scenario used to analyze impacts against the Caltrans criteria is based on a loudest possible hourly peak traffic volume, which is 10 percent of the traffic volume at LOS C roadway capacity. This results in a slight variation in future noise levels as compared to the assessment of future noise impacts considered under City criteria, which is based on the 2035 plus project traffic volumes listed in the traffic report.

7.1.1 Caltrans

Estimated peak hour noise levels under Existing conditions and at LOS C conditions are provided in Table 7-1. As seen in Table 7-1, at LOS C the noise levels in adjacent residential areas would increase by between 4 and 13 dBA.

Table 7-1
EXISTING AND LOS "C" PEAK HOUR NOISE LEVELS

Receiver Number	Existing Peak Hour Noise Level (dBA L_{EQ})	Level of Service "C" Peak Hour Noise Level[1] (L_{EQ} dBA)	Difference
R-1	48	61	+13
R-2	44	57	+13
R-3	53	63	+10
R-4	47	58	+11
R-5	53	64	+11
R-6	48	58	+10
R-7	52	57	+5
R-8	47	51	+4
R-9	55	59	+4
R-10	56	60	+4
R-11	56	60	+4
R-12	46	58	+12
R-13	46	58	+12
R-14	47	58	+11
R-15	47	57	+10
R-16	48	59	+11
R-17	46	56	+10
R-18	47	58	+11

Table 7-1 (cont.) EXISTING AND LOS "C" PEAK HOUR NOISE LEVELS			
Receiver Number	**Existing Peak Hour Noise Level (dBA L_{EQ})**	**Level of Service "C" Peak Hour Noise Level[1] (L_{EQ} dBA)**	**Difference**
R-19	52	63	+11
R-20	53	63	+10
R-21	51	61	+10
R-22	53	63	+10
R-23	52	62	+10
R-24	44	55	+11
R-25	46	54	+8
R-26	49	54	+5
R-27	50	54	+4
R-28	61	65	+4
R-29	60	64	+4
R-30	59	63	+4

7.1.2 City of San Diego

Table 7-2 shows the predicted traffic noise impacts in the existing (with and without Project) and year 2035. Future traffic levels are based on the buildout plus project traffic volumes provided in the traffic report, and take into account existing walls along Torrey Meadows Drive and Torrey Santa Fe Road. As shown, all levels would be within the City exterior noise threshold of 65 CNEL. Therefore, existing noise walls along these roadways are deemed sufficient, and no additional noise abatement is necessary.

Table 7-2
EXISTING AND FUTURE DAILY NOISE LEVELS
(CNEL)

Receiver Number	Existing Noise Levels	Existing + Project	Increase due to Project under Existing Conditions	Exceeds 65 CNEL[1]	Significant Impact?	Future Conditions[2]	Significant Impact?
R-1	48	57	9	No	No	57	No
R-2	44	53	9	No	No	53	No
R-3	53	59	6	No	No	59	No
R-4	47	54	7	No	No	55	No
R-5	53	60	7	No	No	61	No
R-6	48	55	7	No	No	56	No
R-7	52	55	3	No	No	56	No
R-8	47	50	3	No	No	51	No
R-9	55	58	3	No	No	59	No
R-10	56	58	2	No	No	59	No
R-11	56	58	2	No	No	60	No
R-12	46	52	6	No	No	56	No
R-13	46	52	6	No	No	56	No
R-14	47	53	6	No	No	54	No
R-15	47	54	7	No	No	54	No
R-16	48	55	7	No	No	55	No
R-17	46	53	7	No	No	53	No
R-18	47	54	7	No	No	54	No
R-19	52	59	7	No	No	59	No

Table 7-2 (cont.)
EXISTING AND FUTURE DAILY NOISE LEVELS
(CNEL)

Receiver Number	Existing Noise Levels	Existing + Project	Increase due to Project under Existing Conditions	Exceeds 65 CNEL[1]	Significant Impact?	Future Conditions[2]	Significant Impact?
R-20	53	60	7	No	No	60	No
R-21	51	57	6	No	No	58	No
R-22	53	59	6	No	No	60	No
R-23	52	58	6	No	No	59	No
R-24	44	51	7	No	No	52	No
R-25	46	51	5	No	No	52	No
R-26	49	52	3	No	No	53	No
R-27	50	53	3	No	No	54	No
R-28	61	64	3	No	No	65	No
R-29	60	63	3	No	No	64	No
R-30	59	62	3	No	No	63	No

[1] City threshold for exterior noise levels in residential areas.
[2] Based on 2035 + Project traffic volumes predicted for each receiver location as determined by the traffic report (Urban Systems Associates, Inc., 2014).

Chapter 8. Construction Noise

Both Caltrans and the City have established standards for construction. Section 14-8.02 (Noise Control) of Caltrans standard specifications provides information that can be considered in determining whether construction would result in adverse noise impacts. The specification states:

- Do not exceed maximum noise levels (L_{MAX}) of 86 dBA at 50 feet from the construction site from 9:00 p.m. to 6:00 a.m.;
- Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

Additionally, the City has established a standard for construction noise at residentially zoned properties. Construction noise would be considered adverse if it would exceed 75 dBA averaged over an 12-hour period between 7:00 a.m. and 7:00 p.m.

Construction of the Project is anticipated to last approximately 18 months. Standard construction equipment would be used, including dozers, scrapers, and miscellaneous trucks. Hourly average noise levels from construction on the project site were determined using the Roadway Construction Noise Model (RCNM) (FHWA 2008). The five noisiest pieces of construction equipment (loader, scraper, roller, crane, and concrete pump truck) generate maximum noise levels ranging from 70 to 90 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. Based on a worst-case assumption of all of the loudest pieces of equipment operating simultaneously in the same location, construction of the Project would have the potential to generate hourly average noise levels up to 83 dBA at 50 feet from the construction site, and maximum noise levels may exceed the Caltrans construction noise standard if construction occurs during nighttime or early morning hours (before 6:00 a.m. or after 9:00 p.m.).

Noise levels would potentially exceed the City construction noise standard of 75 dBA. The nearest residences to the Project construction area are along Torrey Meadows Drive, located within 50 feet of the construction staging area. The worst-case construction estimate is conservative because construction equipment would be spread out over the project site, and would not be operating all at once. Further, existing noise walls along the roadways would reduce construction noise levels heard at residences. However, in order to ensure that noise levels would not exceed a 12-hour average noise level of 75 dBA at the nearby residents, Project construction would need to comply with the standard construction best management practices listed below.

1. The construction contractor shall be required to work in such a manner so as not to exceed an 12-hour average sound level of 75 dBA at any noise-sensitive land use (residential) between 7:00 a.m. and 7:00 p.m. Monday through Saturday. Sound levels may be limited by sound control devices, limited the number of equipment operating at once, or installation of temporary plywood noise barriers 8 feet in height between the construction site and sensitive receptors.
2. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise.
3. Stationary construction noise sources such as generators or pumps shall be located at least 100 feet from noise-sensitive land uses as feasible.
4. Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as feasible.

With implementation of the above measures, construction noise levels would be less than significant under standards established by both the City and Caltrans.

Chapter 9. References

California Department of Transportation

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