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concentrations of pesticides in the soil. On the east side of I-5 near Piraeus Street there is a burn ash landfill location with non-hazardous material. At Palomar Airport Road, there are gasoline stations just outside the project area with petroleum hydrocarbon impacts to soil and groundwater. North of Cannon Road on the east side of I-5, there is a strawberry field; testing indicated the soil overall is not hazardous with regard to pesticides, but pesticides are present. At Tamarack Avenue, there are gas stations with petroleum hydrocarbon impacts to soil and groundwater. Near the southbound on-ramp at Carlsbad Village Drive, there is a gas station with petroleum hydrocarbon impacts to soil and groundwater. A former landfill is located on the east side of I-5 at Maxson Street in Oceanside. See *Figures 3-13.1* and *3-13.2.*

3.13.3 Environmental Consequences

The impacts are very similar for all of the build alternatives and the following discussion is presented on a project basis. All alternatives would potentially result in the discovery of contaminated materials.

The hazardous waste investigations determined that the following contaminants occur, or have the potential to occur, within the project area:

- Aerially Deposited Lead (ADL)
- Petroleum Hydrocarbons
- Landfills
- Pesticides and Herbicides
- Chemical Spills
- Asbestos
- Lead
- Treated Wood

Aerially Deposited Lead

Construction activities associated with the four build alternatives would invoke the Department of Toxic Substances Control (DTSC) lead variance. The soil in the median of I-5 is hazardous, while the soil along and adjacent to the shoulders of I-5 is non-hazardous with respect to ADL. If excess soil from the shoulders is exported, then further characterization would be necessary to evaluate proper disposal criteria (i.e., since the shoulder soil may contain ADL).

Petroleum Hydrocarbons

Hazardous waste with respect to petroleum hydrocarbons concerns include a number of service stations located at intersections. Petroleum hydrocarbons may be encountered in soil and groundwater during associated trenching to move utilities and during bridge reconstruction/widening at abutments and bents. Caltrans would comply with the Dewatering permit for the San Diego Region for handling and disposal of groundwater (Order No. R9-2008-02 and any reissuance thereof). If soil from abutment excavations at Via de la Valle, Birmingham Drive, Brooks Street, Palomar Airport Road, Carlsbad Village Drive, and Mission Avenue would be exported, the soil may require further characterization for petroleum hydrocarbons, volatile organic compounds (VOCs), or semi-volatile organic compounds to evaluate the proper disposal method. *Table 3.13.1* shows the potential for encountering hazardous waste issues/materials at each bridge/intersection. The potential for encountering hazardous waste at these locations is characterized as Low, Medium, or High.

Table 3.13.1: Bridge/Intersection with Potential for Hazardous Waste

Undercrossing / Overcrossing / Intersection	Potential
La Jolla Village Drive OC	Low
Voigt Drive OC	Low
Genesee Avenue OC	Low
Del Mar Heights Road OC	Low
San Dieguito River	Low
Via de la Valle UC	**Medium**
Lomas Santa Fe Drive UC	Low
Manchester Avenue UC	Low
Birmingham Drive OC	**Medium**
MacKinnon Avenue OC	Low
Santa Fe Drive UC	Low
Encinitas Boulevard UC	Low
Leucadia Boulevard OC	Low
La Costa Avenue OC	Low
Batiquitos Lagoon	Low
Poinsettia Lane OC	Low
Palomar Airport Road OC	**High**
Cannon Road UC	Low
Agua Hedionda Lagoon	Low
Chinquapin Avenue OC	Low
Tamarack Avenue OC	Low
Chestnut Avenue UC	Low
Carlsbad Village Drive UC	**Medium**
Las Flores Drive OC	Low
Jefferson Street OC	Low
Buena Vista Lagoon	Low
SR-78 / I-5 Sep Br # 57-270	Low
Cassidy Street OC	Low
California Street OC	Low
Loma Alta Creek	Low
Oceanside Boulevard OH	**Medium**
Brooks Street OC	**Medium**
Mission Avenue OC	**Medium**
Fourth Street / Bush Street OC	Low
Neptune Way / 8th Street OC	Low
I-5 / SR-76 UC	Low
San Luis Rey River	Low
Harbor Drive / Vandegrift Boulevard / Camp Pendleton UC	Low
Camp Del Mar OC	Low

Service stations with a partial or full take at Manchester Avenue (east of I-5), Birmingham Drive (west of I-5), Tamarack Avenue (west of I-5), and Carlsbad Village Drive (west of I-5) have petroleum hydrocarbons in soil and/or groundwater as a result of leaking underground storage tanks.

Landfills

Two landfills were identified within the project footprint, including the Olympus Street Landfill at the intersection of Piraeus and Olympus streets in Leucadia, and the Maxson Street Landfill at Maxson Street in Oceanside. The Olympus Street Landfill is a burn ash site, and is presently occupied mostly with residential housing. Soil sampling at the Olympus Street Landfill identified non-hazardous concentrations of lead within Caltrans' right-of-way and adjacent properties. The Maxson Street Landfill included municipal solid wastes now covered by a park, baseball fields, residential housing, a golf course, and retail businesses. Investigations within the existing Caltrans' right-of-way along the Maxson Street Landfill did not encounter wastes associated with the landfill.

Pesticides and Herbicides

Nurseries and farmland were observed at various locations along both sides of I-5 from the Manchester Avenue Interchange to the Palomar Airport Road Interchange. Nurseries are known to use pesticides and herbicides. The use of pesticides such as DDE (Dichloro Diphenyl Ethane), DDT (Dichloro Diphenyl Trichlorethane), and DDD (Dichloro Diphenyl Dichloroethane) have been banned since the late 1970s, although concentrations of these pesticides and herbicides can remain in the soil for long periods of time. Pesticides and herbicides were encountered in shallow soils on and around nurseries. Overall, testing of soil for pesticides and herbicides indicates that soil containing these pesticides is not a hazardous waste.

Chemical Spills

Chemical spills from truck and auto accidents have historically occurred along I-5. These spills mainly consist of petroleum hydrocarbons, but other chemicals may be present. These spills are difficult to locate in advance.

Asbestos

Asbestos may be found in bridge joint and piping material. These materials may pose a health hazard if workers are exposed to them during construction activities.

Lead

Lead-based paint may have been used on metal guardrails, piping, or in structures to be demolished. If yellow paint or yellow thermal plastic paint would be removed during construction activities, these materials may pose a health hazard if workers are exposed to them during construction activities.

Treated Wood

The wood guardrail posts and signposts on site have been treated with creosote. If these posts were removed, a safety and health work practices plan must be submitted to the Resident Engineer prior to removal. The wood must then be handled and disposed in accordance with Caltrans' treated wood non-standard special provision.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

Designs of the alternatives for the proposed project are a result of extensive research, technical analysis, and community input. The amount of right-of-way required for each alternative is the minimum amount of land required to fulfill the purpose and need of the project, while meeting

the associated operational requirements of the roadway. Wherever possible, the project alternatives follow the existing I-5 alignment to avoid and/or minimize impacts from hazards and hazardous materials. In particular, avoidance of the gasoline stations and soil excavation at Manchester Avenue, Birmingham Drive, Palomar Airport Road, Tamarack Avenue, and Carlsbad Village Drive would be considered. Soil excavated from agricultural land and nurseries may require reuse or proper off-site disposal, with further testing necessary at Manchester Avenue, between Birmingham Drive and Palomar Airport Road, and at Cannon Road. Soils from landfills near Piraeus Street may be reused or disposed as non-hazardous material at the appropriate landfill location; however, the Maxson Street site would be avoided. Further hazardous waste investigation may be necessary on individual parcels to be acquired. Therefore, Environmental Engineering staff shall be kept informed of parcel acquisitions and changes in scope or design. Since there are chemical constituents present in soil and groundwater within the I-5 corridor, soil excavation activities shall be performed under the guidelines of a site-specific Soil Management Plan and a Health and Safety Plan.

In addition, the DTSC lead variance would be followed for ADL soil excavated in the median. Soil in the median along I-5 to a depth of two ft is hazardous with regard to soluble ADL concentrations. This soil may be reused on site in accordance with a DTSC lead variance issued to Caltrans. If this criterion cannot be met, then disposal of ADL soil would be a necessary at a Class I landfill. Soil excavated as a whole along the shoulders may be reused as clean material with regard to ADL, unless soil adjacent to the shoulder is segregated from the whole. The DTSC lead variance will apply for segregated soil from the shoulder. Measures for groundwater impacts at service stations would be contained in the Dewatering permit for the San Diego Region (Order No. R9-2008-02 and any reissuance thereof). If soil from abutment excavations at Via de la Valle, Birmingham Drive, Brooks Street, Palomar Airport Road, Carlsbad Village Drive, or Mission Avenue would be exported, however, the soil may require further characterization for petroleum hydrocarbons, VOCs, or semi-volatile organic compounds to evaluate the proper disposal method. Investigation near the Olympus and Maxson Street landfills did not encounter wastes associated with the landfills. It is recommended that widening activities in the vicinity of these landfills be moved to the west to avoid the landfill sites. If parcels were acquired at these landfill locations, excavated soil would require further characterization to evaluate the proper disposal method. If soil from locations containing farmland or nurseries is exported, further characterization for pesticide/herbicides would be warranted to evaluate the proper disposal method. Because historical chemical spill locations along I-5 are unknown, a contingency would be written into the construction contract to address this potential hazardous waste issue. Proper handling and disposal measures would be carried out for asbestos, lead paint, and treated wood wastes, which may be in structures demolished during construction.

Figure 3-13.1: Hazardous Materials for High and Medium Risk – North

Figure 3-13.2: Hazardous Materials for High and Medium Risk – South

3.14 Air Quality

The 8+4 Buffer alternative has been refined since the Draft EIR/EIS was publically circulated in 2010. This alternative was presented as the locally preferred alternative (LPA) in the August 2012 Supplemental Draft EIR/EIS, and has now been identified as the Preferred Alternative. The refined 8+4 Buffer alternative has the least amount of impact of any build alternative and also meets purpose and need.

3.14.1 Regulatory Setting

The federal Clean Air Act (FCAA), as amended in 1990, is the federal law that governs air quality while the California Clean Air Act of 1988 is its companion State law. These laws, and related regulations by the U.S. Environmental Protection Agency (USEPA) and California Air Resources Board (CARB), set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and State ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns. The criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) broken down for regulatory purposes into particles of 10 micrometers or smaller(PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). In addition, State standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and State standards are set at a level that protects public health with a margin of safety, and are subject to periodic review and revision. Both State and federal regulatory schemes also cover toxic air contaminants (air toxics). Some criteria pollutants are also air toxics or may include certain air toxics within their general definition.

Federal and State air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA and CEQA. In addition to this type of environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

The FCAA Section 176(c) prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the FCAA requirements related to the NAAQS. "Transportation Conformity" Act takes place on two levels: the regional—or planning and programming—level and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. USEPA regulations at 40 CFR 93 govern the conformity process.

Regional level conformity is concerned with how well the regional transportation system supports plans for attaining the standards set for CO, NO_2, O_3, $PM_{10,}$ and $PM_{2.5}$, and in some areas, SO_2. California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except $SO_{2;}$ the State also has a nonattainment area for Pb. However, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on Regional Transportation Plans (RTPs) and federal Transportation Improvement Programs (TIPs) that include all of the transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the TIP. RTP and TIP conformity is based on use of travel demand and air quality models to determine

whether or not the implementation of those projects would conform to emission budgets or other tests showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and TIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, projects in the RTP and/or TIP must be modified until conformity is attained. If the design, scope, and open to traffic schedule of a proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

As noted in Chapter 1 of this Final EIR/EIS, SANDAG has approved the 2050 RTP, although on December 20, 2012, the San Diego Superior Court entered a judgment finding that the EIR for the 2050 RTP is legally inadequate in certain limited respects. The EIR for the 2050 RTP was invalidated mainly because it allegedly: (1) failed to adequately analyze greenhouse gas (GHG) emissions against Executive Order S-03-05 requirements to reduce GHG emissions 80 percent below 1990 levels by 2050; and (2) failed to identify sufficient legally enforceable mitigation measures for GHG emissions. SANDAG has appealed the judgment to the Court of Appeal. This Final EIR/EIS has been drafted to avoid the narrow alleged deficiencies the Court found in the EIR for the 2050 RTP.

FHWA and Caltrans' environmental analysis for the *I-5 NCC Project* EIR/EIS may draw on facts from the EIR for the 2050 RTP; but it does not tier from the 2050 RTP EIR or rely on the EIR's certification. The project would be constructed by 2035 and includes specific, enforceable mitigation measures for GHG emissions.

Conformity at the project-level also requires "hot spot" analysis if an area is designated as "nonattainment" or "maintenance" for CO and/or PM_{10} or $PM_{2.5}$. A region is "nonattainment" if one or more monitoring stations in the region fail to attain the relevant standard, and USEPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by the USEPA, and are then called "maintenance" areas. "Hot spot" analysis is essentially the same, for technical purposes, as a CO or PM analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a "hot spot" analysis. In general, projects must not cause the "hot spot"-related standard to be violated, and must not cause any increase in the number and severity of violations. If a known CO or PM violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

It should also be noted that new federal standards include a one-hour NAAQS for NO_2 of 100 parts per billion (ppb), while retaining the existing annual standard of 53 ppb. The new one-hour standard was based on observations by USEPA that roadway-associated exposures account for a majority of ambient exposures to peak NO_2 concentrations. Associated monitoring is required to be implemented and operational by January 1, 2013. After three years of monitoring are completed, the USEPA will evaluate the associated data and redesignate individual areas as appropriate for NAAQS attainment or non-attainment status.

3.14.2 Affected Environment

This section is based on the Air Quality Analysis for the I-5 North Coast Project, prepared in August 2007.

The proposed project is located in the San Diego Air Basin (SDAB), which is within San Diego County. The climate of San Diego County is characterized by warm, dry summers and mild, wet winters. One of the main determinants of the climatology is a semi permanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. In San Diego County, the months of heaviest precipitation are November through April, averaging about 9 to 14 in annually. The mean temperature is 62.2°F, and the mean maximum and mean minimum temperatures are 75.7°F and 48.5°F, respectively.

The Pacific High also influences the wind patterns of California. The predominant wind directions are westerly and west-southwesterly during all four seasons, and the average annual wind speed is 5.6 mph.

A common atmospheric condition known as a temperature inversion affects air quality in San Diego. During an inversion, air temperatures get warmer rather than cooler with increasing height. Subsidence inversions occur during the warmer months (May through October) as descending air associated with the Pacific High comes into contact with cooler marine air. The boundary between the layers of air represents a temperature inversion that traps pollutants below it. The inversion layer is approximately 2000 ft AMSL during the months of May through October. However, during the remaining months (November through April), the temperature inversion is approximately 3000 ft AMSL. Inversion layers are important elements of local air quality because they inhibit the dispersion of pollutants, thus resulting in a temporary degradation of air quality.

3.14.3 Environmental Consequences

Regional Air Quality Conformity

The proposed project is fully funded in the 2030 RTP. The proposed project is also listed in the 2050 financially constrained RTP, which was found to conform by SANDAG on October 28, 2011. The FHWA and FTA made a regional conformity determination on December 2, 2011. The project is included in SANDAG's financially constrained 2012 RTIP, page 33. The SANDAG 2012 RTIP was adopted by the SANDAG Board on September 28, 2012, and was determined to conform by FHWA and FTA on December 14, 2012. The design concept and scope of the proposed project is also generally consistent with the project description in the 2030 RTP, and the 2010 RTIP, and the "open to traffic" assumptions of the SANDAG's regional emissions analysis. Therefore, the project is assumed to conform to the SIP and no adverse regional air quality impact would occur as a result of the project.

Project Level Conformity

The FCAA requires the adoption of NAAQS to protect public health and welfare from the effects of air pollution. Current standards are set for SO_2, CO, NO_2, O_3, PM_{10}, fine $PM_{2.5}$, and Pb. State standards have been established by the CARB, and these are generally more stringent than the NAAQS counterparts. Federal and State standards are depicted in *Table 3.14.1.*

Areas are classified by the FCAA as either "attainment" or "nonattainment" for each of the criteria pollutants, based on whether the NAAQS have been met.

The proposed project site is located in the SDAB, which currently meets the federal air quality standards for all of the criteria air pollutants except O_3, as shown in the *Table 3.14.2*. The SDAB was designated as a marginal nonattainment area for the eight-hour O_3 standard in July 2012. The SDAB is designated as a federal maintenance area for CO following its redesignation from the non-attainment to a CO attainment area. *Table 3.14.3* shows the pollutants for which the area has been classified as a federal nonattainment or maintenance area and the number of associated violations within the past three years. State standards currently classify the SDAB area as a "serious-nonattainment" for O_3, and a nonattainment area for $PM_{2.5}$ and PM_{10}.

Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the Air Pollution Control District (APCD). The APCD air quality monitoring station that represents the project area, climate, and topography in the SDAB is the Del Mar-Mira Costa College Monitoring Station. However, the Del Mar-Mira Costa College Monitoring Station only monitors O_3. The next nearest monitoring station is San Diego Beardsley, 1110A Beardsley Street, San Diego, CA 92112. This station monitors CO, NO_X, O_3, PM_{10}, and $PM_{2.5}$. *Table 3.14.4* summarizes the excess of standards and the highest pollutant levels recorded at these stations for the years 2010 and 2012.

Table 3.14.1: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	Federal Standards[2]	
		Concentration[3]	Primary[3,4]	Secondary[3,5]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	–	Same as Primary Standard
	8-Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM_{10})[6]	24-Hour	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m^3	–	
Fine Particulate Matter ($PM_{2.5}$)[6]	24-Hour	–	35 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)[7]	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1-Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	None

Table 3.14.1 (cont.): Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	Federal Standards[2]	
		Concentration[3]	Primary[3,4]	Secondary[3,5]
Sulfur Dioxide (SO_2)[8]	Annual Arithmetic Mean	–	0.030 ppm (80 µg/m^3) (for certain areas)[8]	–
	24-Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3) (for certain areas)[8]	–
	3-Hour	–	–	0.5 ppm (1300 µg/m^3)
	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Lead (Pb)[9,10]	30-Day Average	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary Standard
	Rolling 3-Month Average	–	0.15 µg/m^3	
Hydrogen Sulfide (H_2S)	1-Hour	0.03 ppm (42 µg/m^3)	No Federal Standards	
Sulfates (SO_4)	24-Hour	25 µg/m^3		
Visibility Reducing Particles[11]	8-Hour	See footnote 11		
Vinyl Chloride[9]	24-Hour	0.01 ppm (26 µg/m^3)		

1. California standards for O_3, CO (except Lake Tahoe), SO_2 (1 and 24 hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest eight-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 77°F and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 77°F and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
6. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
7. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
8. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
9. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
10. National lead standard, rolling 3-month average: final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
11. In 1989, the CARB converted the general Statewide 10-mile visibility standard to an instrumental equivalent, which is “extinction of 0.23 per kilometer” when the relative humidity is less than 70 percent.

Source: CARB (June 4, 2013)

Table 3.14.2: Federal and State Criteria Pollutant Attainment Status for the San Diego Air Basin

Pollutant	SDAB Attainment Status	
	Federal	State
O_3 – 1 hour	--	Nonattainment
O_3 – 8 hour	Nonattainment - Marginal	Nonattainment
CO	Maintenance	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
NO_2 – 1 hour	Under Evaluation	--

Table 3.14.3: Federal Nonattainment and Attainment/Maintenance Pollutants in the San Diego Air Basin

Pollutant	Federal Attainment Status	Exceedances in the Last 3 Years
O_3 – 8-hour	Nonattainment, Marginal*	none in 2010, none in 2011, and 2 in 2012
CO	Maintenance	None

*In March 2013, the EPA approved CARB's request to redesignate the SDAB to an attainment/maintenance area for the 1997 8-hour ozone federal standard. Under the new 2008 8-hour federal standard, however, EPA designated the SDAB as a marginal non-attainment area (effective July 2012).

Source: CARB 2013a, USEPA 2013d

Note: CARB indicates that exceedances are not necessarily violations

Table 3.14.4: Ambient Air Quality Summary – San Diego-Beardsley

Pollutant Standards	2010	2011	2012
Carbon Monoxide (CO)			
Maximum National 8-hour concentration (ppm)	2.17	2.44	1.81
Maximum California 8-hour concentration (ppm)	2.17	2.44	1.81
Number of Days Standard Exceeded			
NAAQS 1-hour (>35 ppm)	0	0	0
CAAQS 8-hour (>20 ppm)	0	0	0
NAAQS 8-hour (>9 ppm)	0	0	0
CAAQS 8-hour (>9 ppm)	0	0	0
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration (ppm)	0.077	0.067	0.065
Annual Average (ppm)	0.015	0.014	0.013
Number of Days Standard Exceeded			
CAAQS 1-hour	0	0	0
Sulfur Dioxide (SO_X)[a]			
Maximum National 1-hour concentration (ppm)	0.008	0.001	0.002
Maximum California 24-hour concentration (ppm)	0.0025	0.0005	0.0005
Number of Days Standard Exceeded			
NAAQS 1-hour (>0.075 ppm)	0	0	0
CAAQS 24-hour (>0.04 ppm)	0	0	0

Table 3.14.4 (cont.): Ambient Air Quality Summary – San Diego-Beardsley

Pollutant Standards	2010	2011	2012
Ozone (O_3)[b]			
Maximum 1-hour concentration (ppm)	0.085	0.091	0.088
Maximum 8-hour concentration (ppm)	0.072	0.075	0.079
Number of Days Standard Exceeded			
CAAQS 8-hour (>0.070 ppm)	2	1	2
CAAQS 1-hour (>0.09 ppm)	2	1	3
NAAQS 8-hour (>0.075 ppm)	0	0	2
Particulate Matter (PM_{10})			
National maximum 24-hour concentration (µg/m^3)	40.0	48.0	45.0
National second highest 24-hour concentration (µg/m^3)	38.0	47.0	43.0
State maximum 24-hour concentration (µg/m^3)	40.0	49.0	47.0
State second highest 24-hour concentration (µg/m^3)	39.0	48.0	45.0
National[c] annual average concentration (µg/m^3)	22.8	23.3	21.8
State[d] annual average concentration (µg/m^3)	23.4	24.0	22.2
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 µg/m^3)	0	0	0
CAAQS 24-hour (>50 µg/m^3)	0	0	0
Particulate Matter ($PM_{2.5}$)			
Maximum 24-hour concentration (µg/m^3)	29.7	34.7	39.8
Second highest 24-hour concentration (µg/m^3)	26.2	33.9	34.7
Third highest 24-hour concentration (µg/m^3)	25.3	33.2	32.4
Fourth highest 24-hour concentration (µg/m^3)	24.3	25.4	31.8
National[c] annual average concentration (µg/m^3)	10.4	10.8	11.3
State[d] annual average concentration (µg/m^3)	*	10.9	*
Number of Days Standard Exceeded			
NAAQS 24-hour (>65 µg/m^3)	0	0	1

Notes
* Data Unavailable
[a] Sulfur dioxide readings for 2011 and 2012 taken from the El Cajon-Redwood Avenue Monitoring Station. National 24-hour and Annual Arithmetic Mean revoked in June 2010.
[b] Ozone readings taken at Del Mar-Mira Costa Monitoring Station.
[c] National annual average based on arithmetic mean.
[d] State annual average based on geometric mean.
Source: CARB 2013b,c

Some locations are considered more sensitive to adverse effects from air pollution than others. These locations are commonly termed sensitive receptors and they include hospitals, schools, day care centers, nursing homes, and parks/playgrounds. Sensitive receptors in proximity to localized CO sources, toxic air contaminants, or odors are of particular concern. Sensitive receptors closest to I-5 are presented in *Table 3.14.5*.

Table 3.14.5: Sensitive Receptors

School	District	Street Address	City	Distance (ft)
Preuss School UCSD	San Diego Unified	9500 Gilman Drive, Dept. 0536	La Jolla	1708
Laurel Elementary	Oceanside Unified	1410 Laurel Street	Oceanside	2131
Oceanside High	Oceanside Unified	1 Pirates Cove	Oceanside	1151
Palmquist Elementary	Oceanside Unified	1999 California Street	Oceanside	2280
South Oceanside Elementary	Oceanside Unified	1806 South Horne Street	Oceanside	1512
Buena Vista Elementary	Carlsbad Unified	1330 Buena Vista Way	Carlsbad	800
Jefferson Elementary	Carlsbad Unified	3743 Jefferson Street	Carlsbad	743
Pacific Rim Elementary	Carlsbad Unified	1100 Camino De Las Ondas	Carlsbad	2558
Capri Elementary	Encinitas Union Elementary	941 Capri Road	Encinitas	2025
Paul Ecke-Central Elementary	Encinitas Union Elementary	185 Union Street	Encinitas	1992
North Coast Alternative High	San Dieguito Union High	684 Requeza Street	Encinitas	2445
Sunset High (Continuation)	San Dieguito Union High	684 Requeza Street	Encinitas	2483
San Dieguito High Academy	San Dieguito Union High	800 Santa Fe Drive	Encinitas	1830
Solana Vista Elementary	Solana Beach Elementary	780 Santa Victoria Avenue	Solana Beach	2203
Skyline Elementary	Solana Beach Elementary	606 Lomas Santa Fe Drive	Solana Beach	1388
Earl Warren Middle	San Dieguito Union High	155 Stevens Street	Solana Beach	1931
Solana Highlands Elementary	Solana Beach Elementary	3520 Long Run Drive	San Diego	1462
Del Mar Hills Elementary	Del Mar Union Elementary	14085 Mango Drive	Del Mar	431
Del Mar Heights Elementary	Del Mar Union Elementary	13555 Boquita Drive	Del Mar	1826
Torrey Hills	Del Mar Union Elementary	10830 Calle Mar De Mariposa	San Diego	1481
Ada W. Harris Elementary	Cardiff Elementary	1508 Windsor Road	Cardiff-by-the-Sea	1066
Cardiff School District	Cardiff Elementary	1888 Montgomery Avenue	Cardiff-by-the-Sea	2435
Cardiff Elementary	Cardiff Elementary	1888 Montgomery Avenue	Cardiff-by-the-Sea	2592
Montessori Arts And Sciences Elementary	Carlsbad Unified	3016 Highland Drive	Carlsbad	1764
St. Patrick	Carlsbad Unified	3820 Pio Pico Drive	Carlsbad	187
Discovery Isle Child Development	Carlsbad Unified	6130 Paseo Del Norte	Carlsbad	556

Table 3.14.5 (cont.): Sensitive Receptors

School (cont.)	District	Street Address	City	Distance (ft)
Santa Fe Christian Schools	San Dieguito Union High	838 Academy Drive	Solana Beach	777
Santa Fe Montessori School	Solana Beach Elementary	1010 Solana Drive	Solana Beach	352
St. Mary Star Of The Sea Elementary	Oceanside Unified	515 Wisconsin Avenue	Oceanside	2613
Sanderling School	Cardiff Elementary	1401 Windsor Road	Cardiff-by-the-Sea	1673
Casa Montessori De Carlsbad	Carlsbad Unified	3470 Madison Street	Carlsbad	982
Cal Coast Academy	San Dieguito Union High	983 Lomas Santa Fe Drive, Suite F/G	Solana Beach	1173
Preschool	**Capacity**	**Street Address**	**City**	**Distance (ft)**
A Brighter Future Preschool & Child Development Center	136	3422 Tripp Court	San Diego	577
A Children's Garden – Leucadia	30	1421 Burgundy Road	Encinitas	1618
Back To The Basics Preschool	48	1759 Oceanside Boulevard	Oceanside	887
Balderrama Child Development Center	84	709 San Diego Street	Oceanside	1491
Bright Horizons Family Solutions	151	3720 Arroyo Sorrento Road	San Diego	947
Carlsbad Children's Garden	38	2518 Jefferson Street	Carlsbad	848
Carlsbad Children's House	24	2606 Jefferson Street	Carlsbad	1130
Carlsbad Montessori School	71	740 Pine Avenue	Carlsbad	1197
Casa De Niños Child Development Center	119	1718 Mission Avenue	Oceanside	1577
Casa Montessori De Carlsbad	49	3470 Madison Street	Carlsbad	1104
Childrens Learning Center	73	139 Canyon Drive	Oceanside	2633
Encinitas Migrant Child Development Center	52	1508 Windsor Road	Cardiff-by-the-Sea	1179
Family Recovery Center - Child Development Center	15	1100 Sportfisher Drive	Oceanside	332
Friendly Daycare & Preschool Center	30	1836 Dixie Street	Oceanside	1720
Great Beginnings Preschool	87	511 Encinitas Boulevard #110	Encinitas	1415
Immanuel Lutheran Children's Learning Center	35	1900 South Nevada Street	Oceanside	1937

Table 3.14.5 (cont.): Sensitive Receptors

Preschool (cont.)	Capacity	Street Address	City	Distance (ft)
International Cooperative Nursery School	24	9500 Gilman Drive, Dept. 18	La Jolla	2189
Little Bears Tender Care	75	1828 Oceanside Boulevard	Oceanside	1462
Maac Project Head Start North Coast	60	1501 Kelly Street	Oceanside	150
Maac Project Head Start Oceanside 3	18	509 Sports Fisher	Oceanside	1672
Magdalena Ecke YMCA	128	200 Saxony Road	Encinitas	635
Megastar Children's Christian Academy	27	3780 Pio Pico Drive	Carlsbad	98
Neighborhood House Association (NHA) - Carlsbad Head Start	82	3368 Eureka Place	Carlsbad	216
NHA - Head Start By The Sea	80	777 Santa Fe Drive	Encinitas	1528
NHA - Leucadia Head Start Center	60	616 Old Highway 101	Leucadia	2214
NHA - St. Leo's Head Start Center	74	936 Genevieve Street	Solana Beach	226
Oceanside Child Development Center	136	Corner of Horne Street & Center Avenue	Oceanside	1610
Oceanside Unified School District (OUSD) - Ditmar Elementary	26	1125 South Ditmar	Oceanside	2276
OUSD - Laurel Elementary	30	1410 Laurel Street	Oceanside	2050
San Dieguito United Methodist Pre-School	67	170 Calle Magdalena	Encinitas	759
Sanderling School	18	1401 Windsor Road	Cardiff-by-the-Sea	1518
Sandy Hill Nursery School	34	1036 Solana Drive	Solana Beach	835
Santa Fe Christian Preschool	64	845 Santa Fe Drive	Encinitas	1912
Santa Fe Montessori School	144	1010 Solana Drive	Solana Beach	420
Smart Start Preschool	75	240 Birmingham Drive	Cardiff-by-the-Sea	2269
Solana Beach Community Preschool	28	524 Stevens Avenue	Solana Beach	1600
Solana Beach Presbyterian Preschool	135	120 Stevens Avenue	Solana Beach	1778
Sorrento Valley Children's Center	84	4050-A Sorrento Valley Boulevard	San Diego	1424
Torrey Pines Montessori Center	12	2596 Carmel Valley Road	Del Mar	1919
Trump's Del Mar Hills Nursery School, Inc.	60	13692 Mango Drive	Del Mar	1259

Table 3.14.5 (cont.): Sensitive Receptors

Hospital	Street Address	City	Distance (ft)
Thornton-Perlman Hospital	9300 Campus Point Drive	La Jolla	1105
Veterans Administration Hospital	3350 La Jolla Village Drive	San Diego	859
Scripps Memorial Hospital - La Jolla	9888 Genesee Avenue	La Jolla	858
Scripps Memorial Hospital - Encinitas	354 Santa Fe Drive	Encinitas	203
College/University	**Street Address**	**City**	**Distance (ft)**
University Of California San Diego	La Jolla Village Drive & Gilman Drive	San Diego	895
National University-Carlsbad	705 Palomar Airport Road	Carlsbad	759
Park	**Park Type**	**City**	**Distance (ft)**
Los Peñasquitos Canyon Preserve	Preserve	San Diego	949
Quail Botanical Gardens	Botanical Garden	Encinitas	1489
San Elijo Lagoon Ecological Reserve	Ecological Reserve	Solana Beach/ Encinitas	79
UCSD Park	Passive Open Space	San Diego	160
Los Peñasquitos Canyon Reserve Trail	Trail	San Diego	50
Torrey Hills Neighborhood Park	Community Park	San Diego	2110
Torrey Pines State Reserve	Open Space	San Diego	0-50
Solana Highlands Elementary School & Park	Community Park	San Diego	1160
San Dieguito River Park	Open Space Preserve	San Diego	0
Surf and Turf Recreation Park (a.k.a. Del Mar Golf Center)	Golf and Tennis	San Diego	50
La Colonia Park	Community Park	Solana Beach	960
Glen Park	Community Park	Encinitas	1890
George Berkich Park	Community Park	Encinitas	2490
Cardiff Sports Park	Sports Fields	Encinitas	2320
Hall Property Community Park	Community Park	Encinitas	0
Ada Harris Elementary School & Park	Community Park	Encinitas	740
Mildred MacPherson Park	Community Park	Encinitas	2020
Encinitas Viewpoint Park	Community Park	Encinitas	930
Cottonwood Creek Park	Community Park	Encinitas	20
Paul Ecke Sports Park	Sports Fields	Encinitas	0
Magdalena Ecke Family YMCA	Gym, Pool, Skate Park, and Indoor Soccer Fields	Encinitas	140
Orpheus Park	Community Park	Encinitas	1210
James MacPherson Park	Park	Encinitas	15
Batiquitos Lagoon	Open Space	Carlsbad	0
Aviara Trails	Trail	Carlsbad	720

Table 3.14.5 (cont.): Sensitive Receptors

Park (cont.)	Park Type		City	Distance (ft)
South Carlsbad State Beach	Beach, Open Space		Carlsbad	1740
Poinsettia Park	Community Park		Carlsbad	1850
Car Country Park	Community Park		Carlsbad	50
Cannon Park	Community Park		Carlsbad	1690
Agua Hedionda Lagoon and CDFW Reserve	Open Space and Reserve		Carlsbad	0
Carlsbad State Beach	Beach and Open Space		Carlsbad	2110
Coastal Rail Trail - Carlsbad	Trail		Carlsbad	110
Chase Field and Pine Avenue Park	Sports Fields and Community Park		Carlsbad	360
Oak Park	Picnic Area		Carlsbad	50
Pio Pico Park	Picnic Area		Carlsbad	50
Holiday Park	Community Park		Carlsbad	0
Rotary Park	Community Park		Carlsbad	2530
Maxton Brown Park	Passive Recreation		Carlsbad	2320
Hosp Grove Park	Community Park		Carlsbad	1930
Buena Vista Lagoon	Open Space		Carlsbad & Oceanside	0
South Oceanside Elementary School and Park	Community Park		Oceanside	840
Marshall Street Swim Center and Park	Community Park		Oceanside	1320
Center City Golf Course	Golf Course		Oceanside	0
Ron Ortega Recreation Park	Sports Fields		Oceanside	100
Joe Balderrama Park & Center	Community Park		Oceanside	790
San Luis Rey River Trail	Trail / Bike Path		Oceanside	0
Capistrano Park	Community Park		Oceanside	1110
Nursing Homes	**Capacity**	**Street Address**	**City**	**Distance (ft)**
George G. Glenner Family Center - Encinitas	30	335 Saxony Road	Encinitas	961
Aviara Healthcare Center	119	944 Regal Road	Encinitas	130

Carbon Monoxide (CO)

For the CO hot spot analysis, the procedure outlined in the Transportation Project-Level Carbon Monoxide Protocol, 1997 (CO Protocol) (Institute of Transportation Studies UC Davis 1997) was used to perform a microscale air quality modeling using EMFAC2002 and CALINE4 (Caltrans 1989). EMFAC2002 (CARB 2007) was used to calculate the CO emission factors required for modeling. CALINE4 included in the CL4 software package was used to predict the maximum one-hour average CO concentrations at selected intersections in the proposed project limits (*Table 3.14.6*).

The composite CO emission factors were calculated for the years 2015 and 2030 for the SDAB. The EMFAC2002 SDAB default data were used for most variables including: model years; vehicle classes; inspection and maintenance program schedule; control technology; vehicle

population and odometer accrual rates; vehicle miles traveled (VMT) and vehicle trips; and profiles of Reid Vapor Pressure, temperature, humidity, speed fractions, and idle times.

The ambient temperature used in EMFAC modeling was the lowest mean minimum temperature over a representative period of at least three years, adjusted by +5°F for both the morning and evening peak hours as recommended by the CO protocol. The temperature was determined to be 44.0°F (NWS 2009).

The average free flow speeds for the selected links were obtained from the project traffic study. These speeds were then used to determine the average cruise speed based on the arterial classifications. The links' average approach and departure speeds were also determined based on traffic volume, average cruise speed, and percentage of red time.

The eight-hour maximum CO concentration was calculated by applying a persistence factor of 0.7 to the predicted maximum one-hour average CO concentrations obtained from each modeling run. The background concentrations were then added to the predicted concentrations to calculate the modeled maximum concentrations, which were then compared to the CAAQS and NAAQS to determine if the proposed project results in exceedances.

Table 3.14.6: Estimated CO Concentration Hot Spot Modeling Results

Intersection	Existing		2030 No Build		2015 10+4 Scenarios		2030 10+4 Scenarios	
	AM	PM	AM	PM	AM	PM	AM	PM
One-Hour CO Concentrations								
Palomar Airport Road and I-5 access ramps	11.1	10.8	6.6	7.0	7.7	8.2	6.6	7.1
Genesee Avenue and I-5 access ramps	12.1	13.2	6.5	6.7	7.3	7.0	6.5	6.7
Del Mar Heights Road and I-5 access ramps	10.2	11.3	6.7	6.8	7.5	7.9	6.4	6.8
Federal standard	35							
State standard	20							
Eight-Hour CO Concentrations								
Palomar Airport Road and I-5 access ramps	7.8	7.6	4.6	4.9	5.4	5.7	4.6	5.0
Genesee Avenue and I-5 access ramps	7.8	8.7	4.6	4.7	5.1	4.9	4.6	4.7
Del Mar Heights Road and I-5 access ramps	7.1	7.9	4.7	4.8	5.3	5.5	4.5	4.8
Federal standard	9.0							
State standard	9.0							

Ambient one-hour concentrations are based on maximum CO levels for the Beardsley Street (Downtown San Diego) Monitoring Station.
Eight-hour concentrations are estimated from one-hour concentrations using an urban location persistence factor of 0.7.

Based on the results obtained from a detailed analysis, it has been concluded that the proposed project's future traffic conditions would not exceed federal and State one-hour or eight-hour standards during the a.m. or p.m. peak periods at any of the analyzed intersections. All other intersections in the project area are predicted to experience less delay time and improved operating conditions. The results of the quantitative CO hot spot analysis show that the proposed project would not adversely impact the local air quality.

The Carbon Monoxide (CO) "Hot Spot" analysis that was performed in the August 2007 Air Quality Analysis, was performed using the most current protocol (Transportation Project-Level Carbon Monoxide Protocol [CO Protocol], University of California Davis, December 1997, Caline 4, dispersion modeling software, in conjunction with CT-EMFAC 2002). While there have been recent updates to the CT-EMFAC version, the CO Protocol is still the same as is the traffic information used for modeling input. Any new analysis would result in similar or additionally improved findings due to improvements in vehicle emissions technology and vehicle fleet turnover.

PM_{10} and $PM_{2.5}$

On March 10, 2006, the USEPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed from local air quality impacts in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas. Based on that rule, the USEPA and FHWA published the Transportation Conformity Guidance for Qualitative Hot-Spot Analysis in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Areas (PM guidance) (FHWA 2006b). While the SDAB is not a federally designated PM_{10} and $PM_{2.5}$ nonattainment or maintenance area, it is designated as a State nonattainment area for both pollutants. Thus, to meet State requirements, the proposed project is assessed using the procedure outlined in the PM Guidance.

A hot spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized $PM_{2.5}$ or PM_{10} pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts. When a hot spot analysis is required, it is included within the project-level conformity determination that is made by the FHWA or FTA.

The PM Guidance describes qualitative hot spot analyses. Qualitative hot spot analyses methods involve more streamlined reviews of local factors such as local monitoring data near a proposed project location.

Projects of Air Quality Concern

To meet statutory requirements, the March 10, 2006, final rule requires $PM_{2.5}$ and PM_{10} hot spot analyses to be performed for "projects of air quality concern." Qualitative hot spot analyses would be done for these projects. Projects not identified as projects of air quality concern (POAQC) are considered to meet statutory requirements without any further hot spot analyses.

The PM Guidance defines POAQC as projects within a federally designated $PM_{2.5}$ or PM_{10} nonattainment or maintenance area, funded or approved by the FHWA or FTA, and one of the following types of projects:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles
- Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or those that would change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project

- New bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location
- Expanded bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location
- Projects in, or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan, or implementation plan submittal, as appropriate, as sites of violation or possible violation

Appendix A of the PM Guidance contains examples of POAQC and examples of projects that are not an air quality concern. Under the example of POAQC, a significant volume for a new highway or expressway is defined as facilities with an annual average daily traffic (AADT) volume of 125,000 or more, and a significant number of diesel vehicles is defined as diesel truck traffic representing eight percent or more of the total AADT.

The proposed project is not located in a federally designated $PM_{2.5}$ or PM_{10} nonattainment or maintenance area. Therefore, the proposed project does not meet the criteria of a POAQC as defined in the PM Guidance. PM_{10} and $PM_{2.5}$ hot spot analyses are required by the USEPA Transportation Conformity Rule (40 CFR § 93.116 and 40 CFR § 93.123) to determine project-level conformity in PM_{10} and $PM_{2.5}$ nonattainment or maintenance areas (FHWA 2006a).

The SDAB is not a federally designated PM_{10} or $PM_{2.5}$ nonattainment or maintenance area; thus, the project does not require PM_{10} or $PM_{2.5}$ hot spot analyses. However, the SDAB is in nonattainment for PM_{10} and $PM_{2.5}$ State standards as stated above.

Following the PM Guidance, the project does not meet the requirement set forth as a POAQC. As defined above, the project would expand the I-5 corridor but would not have a significant increase in diesel truck traffic, only six percent diesel trucks. The project would not affect intersections that are LOS D, E, or F with a significant number of diesel vehicles, or change those to LOS D, E, or F, because of increased traffic volumes from a significant number of diesel vehicles related to the project. The project would not create new bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location. The project would not expand bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location. The project would not significantly increase the number of diesel vehicles congregating at a single location affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation. The project does not meet the criteria of a POAQC as defined in the PM Guidance and therefore does not require PM_{10} or $PM_{2.5}$ hot spot analyses.

There has also been practical advice established, based on the California conformity working group practices, to help identify a POAQC. This advice lists three types of projects:

1. Likely a POAQC
   a. Project services 10,000+ AADT of diesel trucks
   b. Project substantially affects truck traffic by means of congestion reduction, capacity expansion or realignment
2. Could be a POAQC
   a. Project moves diesel emissions closer to sensitive receptors, somewhat independent of volume

b. Project increases truck volume 5 to 10 percent, even if volume falls short of USEPA criteria

3. Not likely a POAQC
   a. Project has essentially the same build and no build truck volume

Using this advisory analysis and the PM "Hot Spot" methodology of localized analysis, the project was broken up into 22 segments to determine the worst-case scenario of diesel truck AADT. According to *Table 3.14.7*, the worst-case AADT of diesel trucks, for the 2030 8+4 Buffer alternative (Preferred Alternative), is located at Segment 5, southbound. This segment has an AADT of 7,434 trucks, which is well below the 10,000+ advisory limit and it is during off-peak hours. The highest peak hour AADT truck traffic is only 1,790 at Segment 2 in the southbound direction.

Table 3.14.7: 2030 Worst-case Diesel Trucks AADT for the Preferred Alternative

Segment	2030 Preferred Alternative							
	AADT by Segment							
	SB General Purpose				NB General Purpose			
	Peak	Trucks (6%)	OP	Trucks (6%)	Peak	Trucks (6%)	OP	Trucks (6%)
1	14,994	**900**	85,072	**5,104**	25,101	**1,506**	83,571	**5,014**
2	15,570	**934**	71,706	**4,302**	18,611	**1,117**	67,516	**4,051**
3	17,494	**1,050**	71,044	**4,263**	17,900	**1,074**	89,371	**5,362**
4	29,832	**1,790**	115,943	**6,957**	28,372	**1,702**	112,486	**6,749**
5	27,417	**1,645**	123,893	**7,434**	26,304	**1,578**	110,616	**6,637**
6	24,501	**1,470**	112,262	**6,736**	23,776	**1,427**	104,788	**6,287**
7	22,618	**1,357**	111,630	**6,698**	23,768	**1,426**	107,615	**6,457**
8	20,051	**1,203**	101,623	**6,097**	20,563	**1,234**	97,923	**5,875**
9	19,303	**1,158**	97,345	**5,841**	19,460	**1,168**	94,890	**5,693**
10	18,608	**1,116**	95,765	**5,746**	19,731	**1,184**	93,338	**5,600**
11	18,234	**1,094**	94,648	**5,679**	18,803	**1,128**	91,168	**5,470**
12	17,494	**1,050**	94,224	**5,653**	19,623	**1,177**	91,887	**5,513**
13	16,970	**1,018**	92,111	**5,527**	19,389	**1,163**	89,671	**5,380**
14	17,430	**1,046**	89,804	**5,388**	18,146	**1,089**	85,906	**5,154**
15	20,442	**1,227**	87,813	**5,269**	19,036	**1,142**	80,967	**4,858**
16	22,264	**1,336**	91,709	**5,503**	20,720	**1,243**	82,189	**4,931**
17	22,615	**1,357**	92,816	**5,569**	20,257	**1,215**	81,876	**4,913**
18	19,040	**1,142**	85,541	**5,132**	19,640	**1,178**	80,209	**4,813**
19	13,935	**836**	88,601	**5,316**	21,114	**1,267**	86,567	**5,194**
20	14,454	**867**	86,762	**5,206**	21,006	**1,260**	82,998	**4,980**
21	13,687	**821**	82,277	**4,937**	21,158	**1,269**	79,727	**4,784**
22	13,692	**822**	86,688	**5,201**	19,274	**1,156**	77,175	**4,631**

Note: Peak hours are 6 a.m. to 9 a.m. and 3 p.m. to 6 p.m., total of six hours. Off peak hours are all others, total of 18 hours. This is why off peak AADT is greater than peak AADT.

Table 3.14.8 depicts the AADT truck traffic for the 2030 No Build alternative and shows the same segment with an increased AADT for trucks at 8,398. This project actually reduces the amount of AADT truck traffic, for this worst-case scenario, by 964. Therefore, the proposed project would not affect truck traffic by means of congestion reduction, capacity expansion or realignment and does not fall under category 1 of this advisory analysis.

Table 3.14.8: 2030 Worst-case Diesel Trucks AADT for the No Build Alternative

Segment	2030 No Build							
	AADT by Segment							
	SB General Purpose				NB General Purpose			
	Peak	Trucks (6%)	OP	Trucks (6%)	Peak	Trucks (6%)	OP	Trucks (6%)
1	8,016	**481**	91,605	**5,496**	17,373	**1,042**	90,671	**5,440**
2	7,937	**476**	80,002	**4,800**	11,078	**665**	70,375	**4,223**
3	7,864	**472**	74,161	**4,450**	12,853	**771**	69,676	**4,181**
4	11,258	**675**	131,291	**7,877**	17,497	**1,050**	117,112	**7,027**
5	11,509	**691**	139,969	**8,398**	17,038	**1,022**	119,890	**7,193**
6	9,462	**568**	122,045	**7,323**	16,118	**967**	111,906	**6,714**
7	9,299	**558**	127,372	**7,642**	16,644	**999**	115,077	**6,905**
8	8,385	**503**	124,849	**7,491**	15,888	**953**	119,633	**7,178**
9	8,066	**484**	121,113	**7,267**	15,500	**930**	112,189	**6,731**
10	7,899	**474**	118,107	**7,086**	15,113	**907**	110,148	**6,609**
11	7,829	**470**	116,478	**6,989**	14,868	**892**	108,843	**6,531**
12	7,571	**454**	115,547	**6,933**	14,904	**894**	106,842	**6,411**
13	7,675	**461**	113,796	**6,828**	14,763	**886**	105,048	**6,303**
14	7,501	**450**	113,235	**6,794**	14,399	**864**	100,265	**6,016**
15	8,432	**506**	114,634	**6,878**	13,196	**792**	103,319	**6,199**
16	9,058	**543**	120,565	**7,234**	13,024	**781**	107,515	**6,451**
17	9,171	**550**	121,165	**7,270**	12,945	**777**	105,246	**6,315**
18	8,701	**522**	114,861	**6,892**	12,610	**757**	101,140	**6,068**
19	6,871	**412**	113,456	**6,807**	16,264	**976**	107,313	**6,439**
20	7,313	**439**	114,974	**6,898**	15,980	**959**	99,229	**5,954**
21	6,878	**413**	104,160	**6,250**	16,042	**963**	88,730	**5,324**
22	6,986	**419**	105,012	**6,301**	15,577	**935**	83,426	**5,006**

Note: Peak hours are 6 a.m. to 9 a.m. and 3 p.m. to 6 p.m., total of six hours. Off peak hours are all others, total of 18 hours. This is why off peak AADT is greater than peak AADT.

The Preferred Alternative would only construct HOV lanes in the center of the alignment and would not add additional general purpose lanes. However, there would be some areas throughout the corridor that require additional right-of-way to accommodate the HOV lanes, which would translate into some minor shifting of the number four lane ranging from 3 to 25 ft. As stated above, the project would not increase truck volumes 5 to 10 percent. In the worst case, the project would actually reduce truck AADT by 13 percent.

The third criterion in the advisory analysis is a project that is not likely a POAQC. This describes a project as one that has essentially the same build and no build truck volume. The

combined northbound and southbound truck volume for the Preferred Alternative is 294,848 ADT. However, the combined northbound and southbound truck volume for the No Build alternative is 315,921. Not only does the project meet the third criterion, but it exceeds it because there would be a seven percent reduction in diesel truck traffic.

As stated above, the SDAB is not a federally designated PM_{10} or $PM_{2.5}$ nonattainment or maintenance area; thus, the project does not require PM_{10} or $PM_{2.5}$ hot spot analyses. Emissions burdens for these pollutants have been calculated in *Table 3.14.9* for CEQA purposes, which requires that the future build project be compared with the existing conditions. While PM_{10} would experience a slight increase due to increased volumes, diesel truck emissions, which are directly related to the pollutant, $PM_{2.5}$ would experience a five percent decrease for the 2030 Preferred Alternative when compared with existing conditions.

Table 3.14.9: 2030 Changes (Δ) in Total Project PM Emission Rates

Toxic Air Contaminant	Emissions		Δ % from Existing
	Existing (g/day)	8+4 Alternative (g/day)	
PM_{10} (fugitive dust)	329,920	368,236	12
$PM_{2.5}$ (diesel)	164,147	156,741	-5
Average Percent Change			4

The proposed project does not meet the criteria of a POAQC as defined in the PM Guidance and falls under category 3 of the advisory analysis, not likely a POAQC, and emissions show a reduction of five percent in the diesel-related pollutant $PM_{2.5}$, therefore it does not require a quantitative PM_{10} or $PM_{2.5}$ hot spot analyses.

The proposed improvements to the I-5 North Coast Corridor would increase capacity. The existing diesel fuel truck percentage within the project limits is six percent of AADT, however, which is below the threshold of eight percent. Accordingly, the proposed project would not result in an increase in the ratio of trucks to the overall traffic volumes. Estimated horizon year (2030, equivalent to 2035) truck AADT would remain at six percent. In addition, the proposed project would relieve congestion, improve operations, and provide better circulation.

The nearest air quality monitoring site located in a downwind direction from the project site that provides PM_{10} and $PM_{2.5}$ background information is the Beardsley Monitoring Station. Data from the Beardsley Monitoring Station indicate that the project area meets the current federal PM_{10} and $PM_{2.5}$ standards of 150 ug/m3 (PM_{10}, 24 hours), 35 ug/m^3 ($PM_{2.5}$, 24 hours), and 15 ug/m^3 ($PM_{2.5}$, annual).

Over the past 20 years the SDAB has experienced a decline in the number of days with unhealthy levels of pollutants including PM_{10} and $PM_{2.5}$, despite the region's growth in population and VMT (which both contribute to air pollution problems). Based on the APCD 2009 Annual Report, there has been a general downward trend in the concentration of particulates over that time. *Table 3.14.4* shows the PM_{10} and $PM_{2.5}$ concentrations observed at the Beardsley Monitoring Station from 2010 to 2012, in comparison with federal and State standards.

The proposed project is located in an attainment area for federal PM_{10} and $PM_{2.5}$ standards, and in a nonattainment area for State PM_{10} and $PM_{2.5}$ standards. Based on screening using USEPA PM Guidance, the proposed project is not a Project of Air Quality Concern because it does not meet the criteria due to relatively low truck AADT, truck percentage, and increase in truck volumes comparing the build alternatives and No Build alternative. The proposed project would improve traffic operations by smoothing traffic flow and would contribute to lower PM emissions as compared to the No Build alternative. The proposed project, therefore, is in conformance for federal PM_{10} and $PM_{2.5}$ standards and is unlikely to increase the frequency or severity of any existing exceedances regarding the nonattainment of State PM_{10} and $PM_{2.5}$ standards.

Naturally Occurring Asbestos (NOA)

The FCAA requires the USEPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with FCAA Section 112, the USEPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under this section. On March 31, 1971, the USEPA identified asbestos as a hazardous pollutant, and on April 6, 1973, first published the asbestos NESHAP in 40 CFR 61. In 1990, a revised NESHAP regulation was published by the USEPA.

The asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the project applicant to notify applicable State and local agencies and/or USEPA regional offices before all demolitions or before construction that contains a certain threshold amount of asbestos.

Naturally Occurring Asbestos (NOA)-bearing Serpentine

Serpentine is a mineral commonly found in seismically active regions of California, usually in association with ultramafic rocks and along associated faults. Certain types of serpentine occur naturally in a fibrous form known generically as asbestos. Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about health hazards from activities that disturb asbestos-bearing rocks and soil. In response, the CARB revised its asbestos limit for crushed serpentines and ultramafic rock in surfacing applications from 5 percent to less than 0.25 percent and adopted a new rule requiring best practices dust control measures for activities that disturb rock and soil containing NOA (CDC 2000a).

According to the report A General Location Guide for Ultramafic Rocks in California-Area Likely to Contain Naturally Occurring Asbestos (CDC 2000b), the coastal portion of San Diego County NOA is not typically found in the geological formations present on the proposed project site (CDC 2000a, b). Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

Mobile Source Air Toxics (MSAT)

For the Mobile Source Air Toxics (MSAT) analysis, the FHWA's Interim Guidance on Air Toxic Analysis for NEPA Documents (MSAT Guidance), December 6, 2012, was used, updated from the previous 2006 and 2009 guidance. The proposed project would add or create new

significant capacity to the I-5 North Coast Corridor, which has an AADT level of greater than 150,000. Furthermore, the proposed project is located in proximity to populated areas and sensitive receptors. Consequently, as outlined in the MSAT guidance, a quantitative MSAT analysis is required.

There are no established regulatory concentration targets for the priority MSATs, which include acrolein, benzene, 1,3 butadiene, diesel particulate matter (DPM), diesel exhaust organic gases (DEOG), formaldehyde, naphthalene, and polycyclic organic matter (POM). Therefore, the impacts of these MSATs were assessed through a quantitative alternative analysis in which MSAT emissions are compared among proposed project scenarios for build alternatives in 2015 and 2030, No Build 2015 and 2030, and the existing conditions (2006) to determine if meaningful differences in the levels of MSAT emissions exist. Appropriate mitigation measures should be identified and considered if meaningful differences exist.

Twenty-two segments of the corridor were determined and selected for the analyses. The segment boundaries do not change with the different scenarios. Each segment runs from the middle of each existing interchange to the next interchange and consists of all main lanes, connectors, and HOV lanes, included within the segment for each scenario. Northbound and southbound lanes are included together in each segment. The discrete traffic data for each link contained within a segment are summed up to obtain daily peak and off-peak totals for that segment.

In order to perform the quantitative emissions analysis, CT-EMFAC, which is a California specific transportation project-level analysis tool, was used. This modeling software was designed to model criteria pollutants, MSATs, and carbon dioxide using the latest version of the California Mobile Source Emission Inventory and Emission Factors.

The Caltrans CT-EMFAC tool has been available for several years, with the existing version of CT-EMFAC (version 4.1) being based on data derived from EMFAC 2007. In 2011, CARB released a new version of EMFAC (EMFAC 2011) that includes updated emissions information and travel activity data for car and truck fleets (CARB 2011). Until an updated CT-EMFAC tool is available that incorporates EMFAC 2011 data, the Project-Level Emissions Estimation – Interim Template (Interim Tool) is being used. This Interim Tool combines the existing CT-EMFAC and CARB's EMFAC 2011 online databases to analyze the priority MSATs listed above.

MSAT Analysis

Traffic activity data have been utilized in performing the MSAT analysis, with these data supplemented by available Caltrans data inventory systems for the base year values, as well as by Caltrans forecast modeling of the corridor for future year values (*Table 3.14.10*). Emission factors for the priority MSATs have been obtained for the SDAB portion of San Diego County using the Interim Tool.

The Draft EIR/EIS analyzed the build alternatives. The emissions analysis corresponded with traffic volumes that identified that the MSAT analysis for the 10+4 alternatives would be slightly greater than the 8+4 alternatives. This was not, however, found to be substantive. FHWA-issued Interim Guidance on December 6, 2012 added three pollutants (napthalene, POM and DEOG) and removed one pollutant (acetaldehyde). Because there would be no substantial differences, an updated MSA analysis was only performed for the refined 8+4 Buffer alternative (Preferred Alternative). The results of the MSAT analysis are tabulated in *Tables 3.14.11* and *3.14.12*.

Table 3.14.10: Traffic Activity Data for *I-5 NCC Project*

Year	Scenario	Peak Period (VMT)			Daily Total (VMT)			Average Speed (mph)
		LDV	Trucks	Total	LDV	Trucks	Total	Peak
Existing (2006)	Existing	1,069,290	68,253	1,137,543	5,228,788	333,752	5,562,540	50.5
Operational	No Build	889,325	56,765	946,091	5,926,505	378,288	6,304,793	32.7
Year (2015)	10+4 Scenarios	1,268,670	80,979	1,349,649	6,203,569	395,972	6,599,541	66.5
	8+4 Scenarios	1,241,187	79,225	1,320,411	6,064,769	387,113	6,451,882	60.5
Horizon	No Build	709,360	45,278	754,638	6,624,221	422,823	7,047,044	19.5
Year (2030)	10+4 Scenarios	1,468,049	93,705	1,561,754	7,178,348	458,192	7,636,540	54.7
	8+4 Scenarios	1,313,047	83,812	1,396,859	6,890,497	439,819	7,330,316	39.3

Source: Caltrans Traffic Data, LDV – light duty vehicle, VMT – vehicle miles traveled, mph – miles per hour

Table 3.14.11: 2015 Changes (Δ) in Total Project MSAT Emission Rates

Toxic Air Contaminant	Existing Emissions	No Build Alternative	8+4 Scenarios (8 MF + 2 HOV/ML)			10+4 Scenarios (10 MF + 2 HOV/ML)		
	(g/day)	(g/day)	(g/day)	Δ% from Existing	Δ % from No Build	(g/day)	Δ% from Existing	Δ% from No Build
Diesel PM	59,722	39,411	37,481	-37	-5	32,925	-26	+14
Benzene	28,530	12,974	12,886	-55	-1	24,340	-42	+10
1,3-Butadiene	6,444	2,875	2,865	-56	0	4,234	-46	+17
DEOG	55,035	29,204	26,001	-53	-11	These constituents did not require documentation when the 10+4 MSAT analysis was performed.		
Naphthalene	29,050	31,481	30,199	+4	-4			
Polycyclic organic matter	4,050	4,429	4,314	+7	-3			
Acrolein	1,500	684	688	-54	+1	960	-46	+17
Formaldehyde	24,695	10,781	10,548	-57	-2	19,767		+14
Average Percent Change			**-38**	**-3**	**--**	**-40.5**	**+14**	

MF – mixed-flow lane, ML – Managed Lane, g/day – grams per day (based on vehicle miles traveled)

Table 3.14.12: 2030 Changes (Δ) in Total Project MSAT Emission Rates

Toxic Air Contaminant	Existing Emissions	No Build Alternative	8+4 Scenarios (8 MF + 2 HOV)			10+4 Scenarios (10 MF + 2 HOV)		
	(g/day)	(g/day)	(g/day)	Δ% from Existing	Δ% from No Build	(g/day)	Δ% from Existing	Δ% from No Build
Diesel PM	59,722	34,013	34,343	-42	+1	24,898	-44	+18
Benzene	28,530	6,626	7,286	-74	+10	17,105	-59	+17
1,3-Butadiene	6,444	1,450	1,603	-75	+11	3,001	-62	+25
DEOG	55,035	20,424	17,927	-67	-12	These constituents were not required documentation when the 10+4 MSAT analysis was performed.		
Naphthalene	29,050	30,907	32,109	+11	+4			
Polycyclic organic matter	4,050	4,362	4,523	+12	+4			

Table 3.14.12 (cont.): 2030 Changes (Δ) in Total Project MSAT Emission Rates

Toxic Air Contaminant	Existing Emissions	No Build Alternative	8+4 Scenarios (8 MF + 2 HOV)			10+4 Scenarios (10 MF + 2 HOV)		
	(g/day)	(g/day)	(g/day)	Δ% from Existing	Δ% from No Build	(g/day)	Δ% from Existing	Δ% from No Build
Acrolein	1,500	348	379	-75	+9	680	-62	+26
Formaldehyde	24,695	5,056	5,466	-78	+8	4,255	-61	+19
Average Percent Change				**-49**	**+4**	**--**	**--**	**--**

Caltrans began air quality technical studies for the proposed project in 2006, basing those studies on the most current traffic projections then available, which were SANDAG's Series 10 projected traffic volumes for year 2030 for the 10+4 build alternatives. During the course of the project development process, SANDAG released both the Series 11 forecasts and model that were based upon the 8+4 build alternatives and are within one percent of the Series 10 forecasts. More recently, the Series 12 forecasts and model was released that included forecasts for years 2035 and 2050. Review of these different data sets indicated that the initial Series 10 2030 daily traffic volumes, which were used for the basis of the original traffic studies, were equivalent to the Series 12 2035 daily traffic demand volumes to within an average of 3.5 percent. These demand volumes differences are minimal and a revision at this time would not alter the results of the associated studies. Because the difference between Series 10 and Series 12 decreases to almost zero over time, it does not represent a substantial change and would not impact the alternatives studied or the impacts of those alternatives. Therefore, forecasts presented in this Final EIR/EIS and the associated technical studies are based on the Region's Series 10 model and that analysis is indicative of what is expected to occur in year 2035.

The analysis was refined to determine MSAT emission rates by segments of the I-5 corridor. *Table 3.14.13* shows the approximate segments for the northbound and southbound sides of the freeway. The segments are not of equal length, varying from 0.37 mi to 2.35 mi. *Table 3.14.13* also lists the segment extents and principal land uses near the freeway along each segment.

Table 3.14.13: Land Uses within I-5 Segments

Segment No.	I-5 Segment	Principal Land Use Along Segment
1	La Jolla Village Drive to Genesee Avenue	Residential, Retail & Commercial
2	Genesee Avenue to Carmel Mountain Road	Residential, Retail & Commercial
3	Carmel Mountain Road to Carmel Valley Road	Residential, Retail & Commercial
4	Carmel Valley Road to Del Mar Heights Road	Residential, Retail & Commercial
5	Del Mar Heights Road to Via de la Valle	Residential, Retail & Commercial
6	Vía de la Valle to Lomas Santa Fe Drive	Residential, Commercial, & Industrial
7	Lomas Santa Fe Drive to Manchester Avenue	Residential, Commercial, & Industrial
8	Manchester Avenue to Birmingham Drive	Residential & Retail
9	Birmingham Drive to Santa Fe Drive	Residential & Retail
10	Santa Fe Drive to Encinitas Boulevard	Residential & Retail

Table 3.14.13 (cont.): Land Uses within I-5 Segments

Segment No.	I-5 Segment	Principal Land Use Along Segment
11	Encinitas Boulevard to Leucadia Boulevard	Residential & Retail
12	Leucadia Boulevard to La Costa Avenue	Residential & Retail
13	La Costa Avenue to Poinsettia Lane	Residential & Retail
14	Poinsettia Lane to Palomar Airport Road	Residential & Commercial
15	Palomar Airport Road to Cannon Road	Residential & Commercial
16	Cannon Road to Tamarack Avenue	Residential & Commercial
17	Tamarack Avenue to Carlsbad Village Drive	Residential & Commercial
18	Carlsbad Village Drive to Vista Way	Residential & Commercial
19	Vista Way to Oceanside Boulevard	Residential & Commercial
20	Oceanside Boulevard to Mission Avenue	Residential & Commercial
21	Mission Avenue to SR-76	Residential & Commercial
22	SR-76 to Wire Mountain Road	Residential & Commercial

MSAT Discussion of Results

As discussed in the Draft EIR/EIS, the prior MSAT analysis indicated that a substantial decrease in MSAT emissions would be expected for the build alternatives from the base year (2006) levels through future year levels. This decrease was shown to be prevalent throughout the highest-priority MSATs and the analyzed alternatives, regardless of the difference in mainline configurations. This decrease was also consistent with the aforementioned USEPA study that projects a substantial reduction in on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde between 2000 and 2020. Based on the analysis in the Draft EIR/EIS *Table 3.14.12,* reductions in existing MSAT levels expected by 2030 were: between 44 and 48 percent of DPM, 59 and 62 percent of benzene, 62 and 65 percent of 1,3-butadiene, 62 and 64 percent of acetaldehyde, 62 and 65 percent of acrolein, and 61 and 64 percent of formaldehyde, depending on the alternative. These reductions were projected to be achieved while the total VMT for the alternatives would increase by approximately 32 to 37 percent in 2030 from the base year value depending on the alternative (refer to *Table 3.14.10*).

Prior to preparation of this Final EIR/EIS, Caltrans recalculated MSAT analyses for the refined 8+4 Buffer (Preferred Alternative). This analysis indicates that a substantial decrease in most of the MSAT emissions can be expected for the Preferred Alternative from the base year through future year levels. *Figures 3-14.1* through *3-14.8* illustrate these decreases. This decrease is consistent with the aforementioned USEPA study projections of a substantial reduction in on-highway emissions of benzene, formaldehyde, and 1,3-butadiene prior to 2020. Based on the analysis for this project as shown in *Table 3.14.12,* reductions in existing MSAT levels expected by 2030 are: 42 percent of DPM, 74 percent of benzene, 75 percent of 1,3-butadiene, 67 percent of DEOG, 75 percent of acrolein, and 78 percent of formaldehyde. Comparing the 2030 Preferred Alternative with the No Build alternative shows that MSAT levels would increase by 11 percent, in the worst case, for 1,3 Butadiene, and by 1 percent for Diesel Particulate Matter (DPM), while the emissions for Diesel Exhaust Organic Gases (DEOG) would decrease by 12 percent. MSAT levels would increase slightly for naphthalene and POM by 11 percent and 12 percent, respectively. MSAT priority pollutant levels for the Preferred Alternative would also decrease by an average of three percent (2015) and increase by an average of four percent (2030) compared to the No Build alternative, with the 2030 increase due to the higher projected traffic volumes shown on *Table 3.14.11*. It should be noted that the pollutants directly

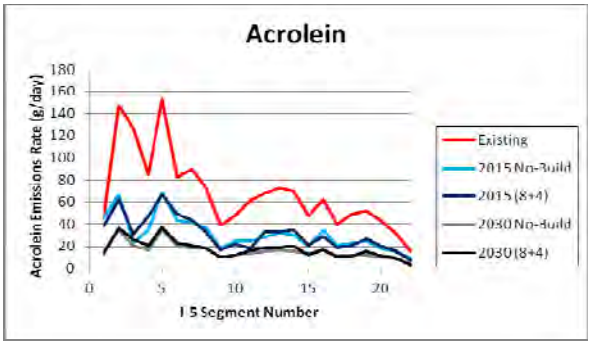

Figure 3-14.1: Changes in Acrolein Emission

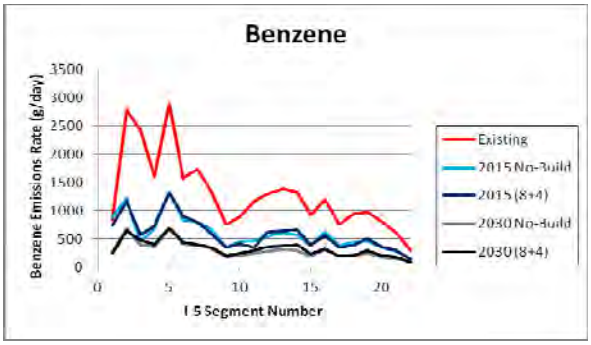

Figure 3-14.2: Changes in Benzene Emission

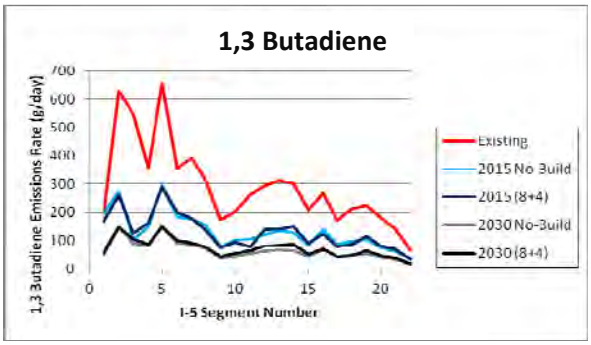

Figure 3-14.3: Changes in Butadiene Emission

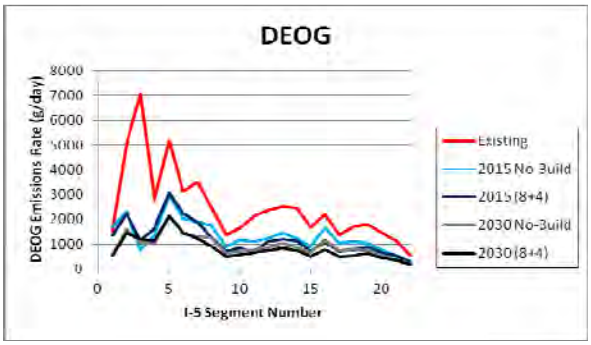

Figure 3-14.4: Changes in DEOG Emission

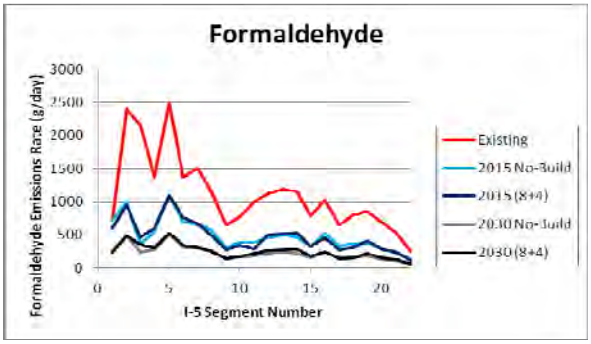

Figure 3-14.5: Changes in Formaldehyde Emission

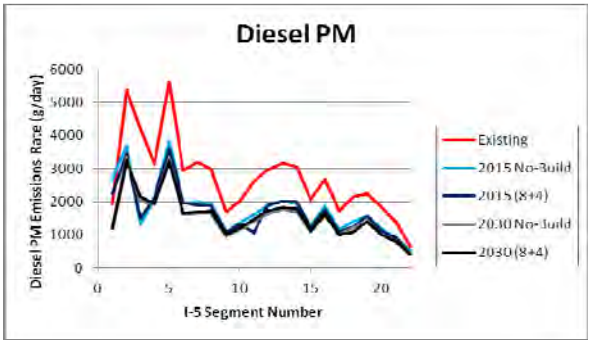

Figure 3-14.6: Changes in Diesel PM Emission

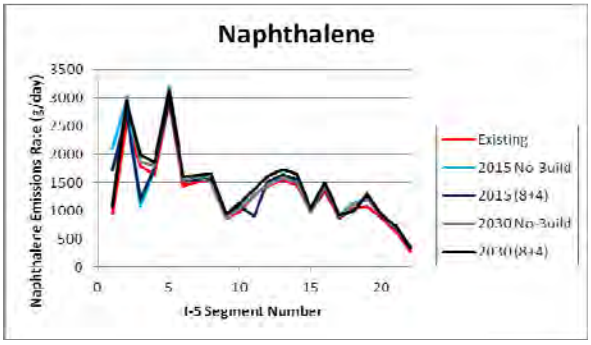

Figure 3-14.7: Changes in Naphthalene Emission

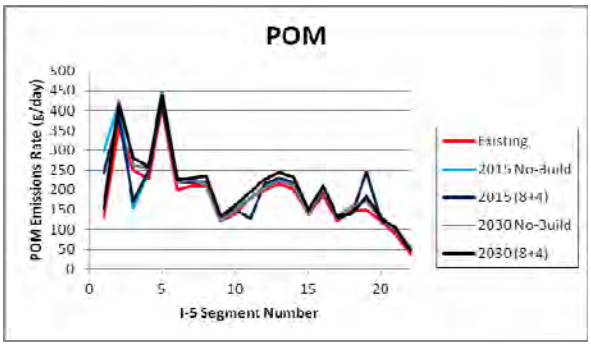

Figure 3-14.8: Changes in POM Emission

related to diesel trucks, DPM and DEOG, would experience almost no change and even a decrease in MSAT emissions, +1 percent and -12 percent respectively, when comparing the 2030 Preferred Alternative to the No Build alternative. In addition, the 2030 Preferred Alternative would experience reduced MSAT emissions levels when compared to the 2030 10+4 Alternative, with DPM being the largest at a 17 percent reduction.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating Impacts of MSATs

Controlling air toxic emissions became a national priority with the passage of the FCAA Amendments (CAAA) of 1990, whereby Congress mandated that the USEPA regulate 188 air toxics, also known as hazardous air pollutants. The USEPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, the USEPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, DPM plus DEOG (diesel PM), formaldehyde, naphthalene, and POM. While the FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future USEPA rules. The 2007 USEPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using USEPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in *Figure 3.14.9*.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, Caltrans is duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, USEPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

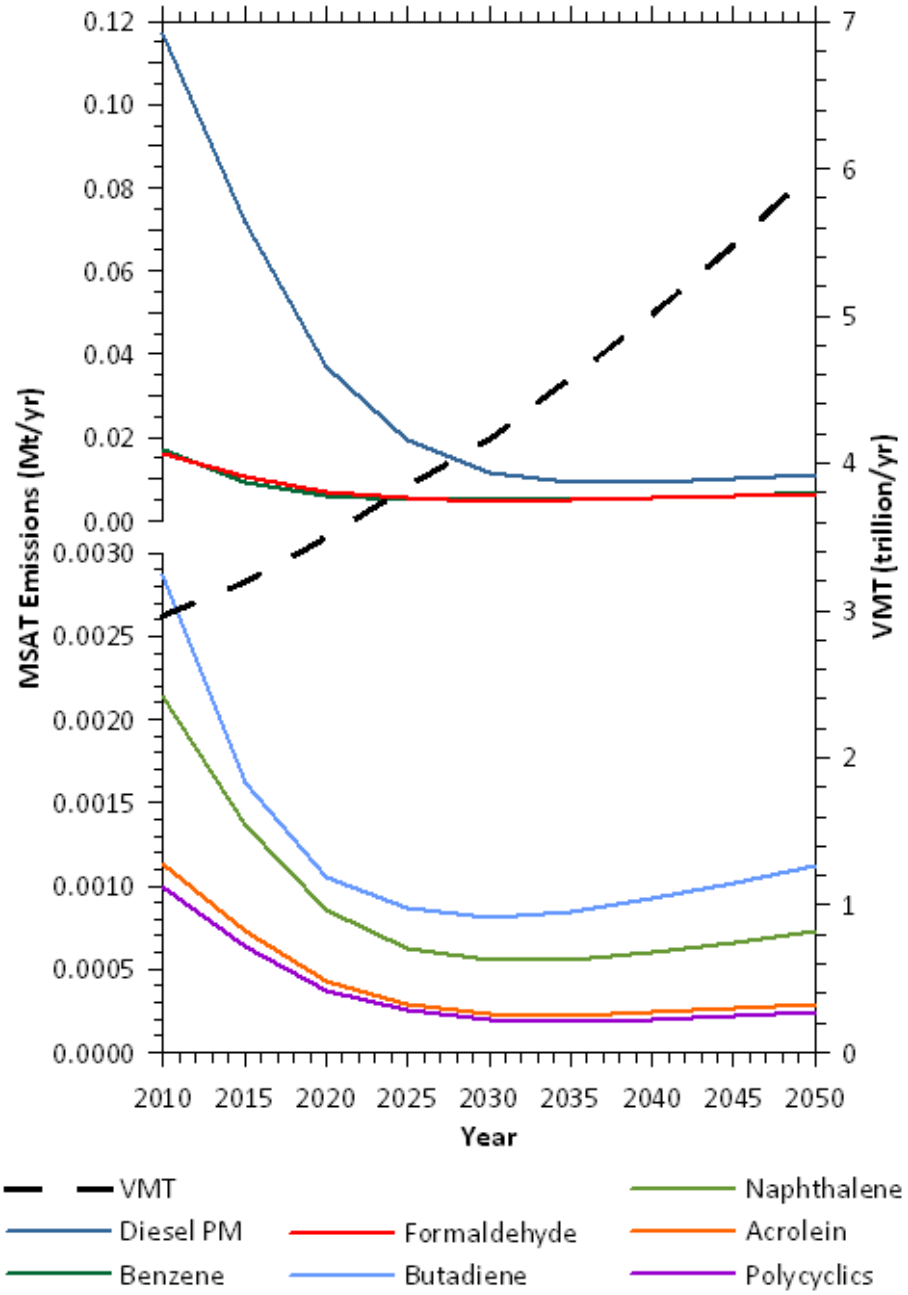

Figure 3-14.9: National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways Using USEPA's MOVES2010b Model

Note: Trends for specific locations may be different, depending on locally derived information representing VMT, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: USEPA MOVES2010b model runs conducted during May to June 2012 by FHWA

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway

alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. The agency is the lead authority for administering the FCAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. The agency maintains the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (USEPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations also are active in the research and analyses of the human health effects of MSAT, including the HEI. Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Adverse health effects linked to MSAT compounds at high exposures include: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts, with each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) MSAT assessments, particularly because assumptions have to be made regarding changes in travel patterns and vehicle technology (both of which affect emissions rates) over that timeframe, and such information is generally unavailable. It is also particularly difficult to reliably forecast 70-year lifetime concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, with such information being similarly unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The USEPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the FCAA to determine whether more

stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries.

The decision framework is a two-step process. The first step requires the USEPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld the USEPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits. These benefits include reducing traffic congestion, accident rates, and fatalities, as well as improved access for emergency response, each of which is better suited for quantitative analysis.

In conclusion, Caltrans has provided a quantitative analysis of MSAT emissions relative to the various alternatives, and has acknowledged that some alternatives may result in increased MSAT emissions in certain locations. However, no meaningful differences in MSAT emissions were observed amongst alternatives and thus no mitigation measures are required. In addition, due to the described uncertainties regarding concentrations and the duration of exposures, the health effects from these emissions have not been estimated.

Construction Impacts

I-5 construction would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials. Specifically, construction activities associated with segment widening, mainline bridge construction, and overcrossing/undercrossing construction would generate air pollutants. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions.

The principal criteria pollutants emitted during construction would be PM_{10} and $PM_{2.5}$. The source of these pollutants would be fugitive dust, created during clearing, grubbing, excavation, and grading; demolition of structures and pavement; vehicle travel on paved and unpaved roads; and material blown from unprotected graded areas, stockpiles, and haul trucks.

A secondary source of pollutants during construction would be the engine exhaust from construction equipment. The principal pollutants of concern would be nitrogen oxides (NO_X) reactive organic gases (ROGs), and volatile organic compounds (VOCs) emissions that would contribute to the formation of O_3, a regional nonattainment pollutant.

Site preparation and roadway construction typically involve clearing, cut-and-fill activities, grading, removal of or improvement to existing roadways, and paving of roadway surfaces. Construction-related effects on air quality from proposed highway improvements would be greatest during the site preparation and demolition phases, which involve excavation, handling, and transport of soils to and from the site. These activities could temporarily generate PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions also would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the USEPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. Caltrans' Standard Specifications (Section 14-9.02) pertaining to dust minimization requirements require use of water or dust palliative compounds and would reduce potential fugitive dust emissions during construction.

In addition to dust-related PM_{10} emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Federal conformity regulations require analysis of construction impacts for projects when construction activities will last for more than five years. The proposed project would be broken into separate contracts of construction each lasting less than five years; therefore, no quantitative estimates of regional construction emissions are required. However, the Air Quality Analysis, dated August 2007, did perform a construction emissions analysis and found that activities limited to 6.6 miles of roadway and bridge construction working simultaneously in the region would not have a significant impact on air quality. For further analysis related to this topic, please review the noted Air Quality Analysis. In addition, it is recommended that specific measures to control dust and particulates be incorporated into project specifications. These measures are identified in *Section 3.14.4*.

Minimal air quality impacts could also occur from construction of the proposed community enhancement projects. Construction of the majority of the community enhancements would occur within the project's construction footprint and these were accounted for within the construction emissions budget. Grading, paving, and landscaping for these features would be accomplished in conjunction with the freeway project, as described in *Section 2.3* and demonstrated on *Tables ES.12* and *ES.13* of this Final EIR/EIS.

Emissions from the construction phase of the project were estimated through the use of emission factors from the Sacramento Metropolitan Air Quality Management District's

(SMAQMD) Road Construction Model Version 6.3.2,[1] which was released in July 2009 and was the most recent version when the analysis was performed.[2] Assumptions from the 2007 Air Quality Report were used when running the current Road Construction Model Version 6.3.2, with the exception of start date. The modeled bridge construction scenario assumed a project length of 0.036 mi and an area of 4.3 ac, constructed during a 12-month period. Daily maximum area disturbed was assumed to be 0.9 ac per day, and no soil import or export haul trucks trips would be made. The modeled roadway widening scenario assumed a project length of 1.3 mi and an area of 28 ac, also constructed within a 12-month period. For this scenario, daily maximum area disturbed was assumed to be 4.6 ac per day and 4,000 cubic yards (cy) of soil import was assumed per day, resulting in 200 round-trip haul truck trips per day. For the purposes of estimating emissions, construction phasing for both the bridge construction and roadway widening model scenarios included the following assumptions:

- Grading/land clearing (1.2 months)
- Grading/excavation (5.4 months)
- Drainage/utilities/sub-grade (3.6 months)
- Paving (1.8 months)

Estimated maximum annual construction emissions of VOC, NO_X, CO, and PM_{10} generated during construction of the bridge construction scenario and the roadway widening scenario are presented in *Table 3.14.14*.

Table 3.14.14: Estimated Construction Emissions (tons/year)

Construction Phase	VOC	NO_X	CO	PM_{10}
Grubbing/Land Clearing	0.2	1.1	1.3	0.4
Grading/Excavation	1.7	12.1	14.2	2.2
Drainage/Utilities/Sub-Grade	0.7	3.8	4.3	1.3
Paving	0.1	0.7	1.1	0.1
Total of Construction Phases	2.7	17.7	20.9	4.0
De Minimis Limit	100	100	100	100

Source: Road Construction Model Version 5.1
Note: PM_{10} estimates assume 50 percent control of fugitive dust from watering and associated dust control measures.

Construction emissions are assessed against the federal general conformity *de minimis* thresholds, which are used to determine conformity of a federal action with existing air quality plans. The *de minimis* threshold for CO in an area under a maintenance plan is 100 tons per year. The *de minimis* thresholds for O_3 (eight-hour) moderate nonattainment are 100 tons per year for both NO_X and VOC. The *de minimis* threshold for PM_{10} nonattainment is 100 tons per

[1] The 2007 Air Quality Report for the *I-5 NCC Project* estimated potential construction air quality impacts resulting from construction activities. The report did not calculate CO_2 emissions as it was based on the SMAQMD Road Construction Emissions Model Version 5.1, which did not calculate CO_2. The SMAQMD Road Construction Emissions Model Version 6.3.2 estimates CO_2 emissions and provides more recent emission factors than Version 5.1; therefore, current criteria air pollutant emissions presented in this section are also estimated using Version 6.3.2 (i.e., EMFAC 2007 and OFFROAD 2007 emission factors).

[2] The SMAQMD released a more recent version in September 2012; however, it would tend to estimate lower air pollutant emissions because it reflects some Statewide measures that are intended to reduce off-road vehicle and heavy-duty truck emissions.

year. Although the SDAB is not a federal nonattainment or maintenance area for PM_{10}, it is a State nonattainment area; therefore, use of this limit would represent a conservative threshold. $PM_{2.5}$ is not a required pollutant to quantify according to the federal general conformity *de minimis* thresholds, and as a result, $PM_{2.5}$ is not included in this analysis.

Climate Change

Climate change is analyzed in *Chapter 4*, *California Environmental Quality Act Evaluation*. Neither the USEPA nor FHWA has published explicit guidance or methodology to conduct project-level GHG analysis. As stated on the FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process would facilitate decision making and improve efficiency at the program level, and would inform the analysis and stewardship needs of project-level decision making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, this issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by the FHWA to lessen climate change impacts correlate well with related efforts that the State has undertaken, and the FHWA is striving to deal with transportation and associated climate change issues. Specific strategies in these efforts include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

3.14.4 Avoidance, Minimization, and/or Mitigation Measures

Most of the construction impacts to air quality are short-term in duration and, therefore, would not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes (such as storm water pollution control) would reduce any air quality impacts resulting from construction activities:

- The construction contractor shall comply with Caltrans' Standard Specifications in Section 14 (2010).

- Section 14-9.01 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

- Section 14-9.02 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.

- Apply water or dust palliative to the site and equipment as frequently as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emission or at the right-of-way line, depending on local regulations.

- Spread soil binder on any unpaved roads used for construction purposes, and all project construction parking areas.

- Wash off trucks as they leave the right-of-way as necessary to control fugitive dust emissions.

- Properly tune and maintain construction equipment and vehicles. Use low-sulfur fuel in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.

- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.

- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.

- Near sensitive air receptors, establish Environmentally Sensitive Areas (ESAs) or their equivalent within which construction activities involving the extended idling of diesel equipment would be prohibited, to the extent feasible.

- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.

- Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to minimize emission of dust (particulate matter) during transportation.

- Promptly and regularly remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter.

- Route and schedule construction traffic to avoid peak travel times as much as possible, to reduce congestion and related air quality impacts caused by idling vehicles along local roads.

- Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues, and may need to use controls such as dampened straw.

- Locate construction equipment and truck staging and maintenance areas as far as feasible and nominally downwind of schools, active recreation areas, and other areas of high population density.

3.15 Noise

The 8+4 Buffer alternative has been refined since the Draft EIR/EIS was publically circulated in 2010. This alternative was presented as the locally preferred alternative (LPA) in the August 2012 Supplemental Draft EIR/EIS, and has now been identified as the Preferred Alternative. The refined 8+4 Buffer alternative has the least amount of impact of any build alternative and also meets purpose and need.

3.15.1 Regulatory Setting

NEPA and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA-23 CFR 772 noise analysis; please see *Chapter 4* for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis (*Table 3.15.1*). For example, the NAC for residences (67 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis at the time the noise study was prepared, and would be updated with an additional noise study performed during final design for the approved project alternative. This follows the FHWA protocol that states: "Projects that do not have a completed noise study signed and approved by Caltrans (or FHWA for non-delegated projects) by July 13, 2011, will be required to comply with this updated Protocol and the updated regulation. If a project is modified such that a NEPA reevaluation and new noise study are required, the Protocol and regulation in place at that time must be used" (http://www.dot.ca.gov/hg/env.noise/pub/ca_tnap_may2011.pdf).

Table 3.15.1: Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, dBA L_{eq}(h)	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

Table 3.15.1 (cont.): Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activities
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	--	Undeveloped lands
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

dBA $L_{eq}(h)$ is defined as A-weighted decibels, peak noise hour equivalent sound level
Source: 23 CFR Part 772, 2006

Figure 3-15.1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

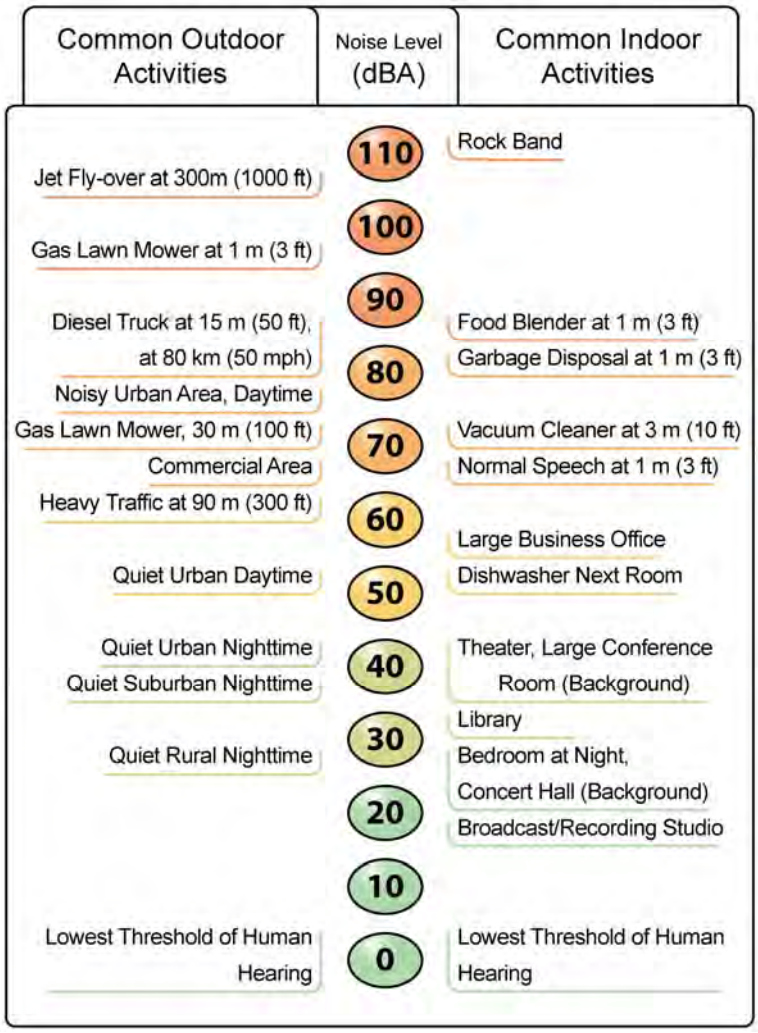

Figure 3-15.1: Noise Levels of Common Activities

In accordance with Caltrans' Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

During final design, Caltrans and FHWA would assess the noise impacts for the approved project alternative. If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated into the project, which were evaluated on the alternative with the largest footprint and the anticipated largest impacts for noise; the 10+4 Barrier alternative.

Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies' input, newly constructed development versus development pre-dating 1978, and the cost per benefited residence.

3.15.2 Affected Environment

The *I-5 NCC Project* is a Type 1 project, described as a project that would physically alter the existing highway or increase the number of through traffic lanes, which could result in increased noise. Therefore, a Noise Study Report (April 2007) was prepared to assess the potential noise impacts associated with the proposed *I-5 NCC Project*. It is incorporated into this document by reference. The report identified noise sensitive locations, and predicted future traffic noise levels for the No Build and a generic 10+4 alternative. A generic 10+4 alternative was modeled because it would represent the worst-case conditions, irrespective of a buffer or barrier, in terms of traffic noise. Although the 10+4 Barrier alternative represents a worst-case impact scenario, the difference in noise levels between it and the other alternatives would be imperceptible. Therefore, in terms of impact analysis, all four build alternatives would be equal. Future noise levels for the No Build and build alternatives were modeled using the LOS C traffic volumes to obtain the worst-case noise scenario.

The cost per benefited residence is determined by calculating an allowance that is considered to be a reasonable amount of money per benefited residence to spend on abatement. The estimated total allowance begins with a base allowance $32,000 with additional allowances per benefited residences determined by Absolute Noise Levels, Noise Level Increase, Achievable Noise Reduction, and if the project is a new highway construction or more than 50 percent of the benefited residences' construction pre-date 1978. Therefore, the estimated total cost allowance per benefited residence is different for different soundwalls. Please refer to Table 1, Cost Allowance Per Residence, (Volume 1 of 2) in the Preliminary Noise Abatement Decision

Report (NADR). If the cost estimate for the soundwall and easements is less than the allowance, then the preliminary determination is that the abatement is reasonable. If the cost estimate is greater than the allowance, the preliminary determination is that abatement is not reasonable. The NADR presents the preliminary noise abatement decision based on acoustical and non-acoustical feasibility factors and the relationship between noise abatement allowances and the engineer's cost estimate.

There may be situations where "severe" traffic noise impacts exist or are expected but the abatement measures are not feasible or reasonable. A severe noise impact is considered to occur when predicted exterior noise levels equal or exceed 75 dBA peak noise hour equivalent sound level (L_{eq}(h)) or are 30 decibels (dB) or more above existing noise levels. In these instances, noise abatement measures must be considered. Such measures are considered "unusual and extraordinary" abatement measures and may include measures such as constructing soundwalls that have an estimated construction cost that exceeds the reasonable allowance or providing interior abatement in residential units. Unusual and extraordinary abatement proposed on a federal-aid project is subject to approval by the FHWA on a case-by-case basis. When noise abatement is provided on public or private properties consistent with this policy, an agreement must be entered into with the owner of the subject property that specifies that Caltrans is not responsible for any future costs of operating or maintaining the noise abatement measures. Unusual and extraordinary abatement must reduce noise by at least 5 dB to be considered feasible from an acoustical perspective.

Several site visits were conducted to identify representative noise sensitive receptor locations and noise measurement sites. Noise measurement sites are locations where noise measurements are taken in order to determine existing noise levels and to verify or calibrate computer noise models. These sites were chosen as being representative of similar sensitive sites in the area. Locations that are expected to receive the greatest noise impacts, such as the first row of houses from the noise source, are generally chosen. Noise measurements were conducted in frequent outdoor human-use areas and indoor classroom locations. All measurement sites were selected so that there would be no unusual noises from sources such as dogs, pool pumps, or children that could affect the measured levels. It is also desirable to choose sites that are free of major obstructions or contamination.

Noise measurements were taken at sensitive locations within the project limits to establish baseline conditions, to calibrate the future traffic noise model, to determine the interior noise levels in classrooms, and to determine the drop-off rate from the front to backyard at certain residences. Noise measurements were conducted in conformance with Caltrans and FHWA standards and guidance.

Existing land uses within the study area are primarily residential, with some schools, parks, and commercial land uses that include hotels/motels, restaurants, as well as wholesale and retail stores.

Due to the length of the proposed project, the noise impact analysis was divided into 22 roadway segments for organizational purposes. *Table 3.15.2* provides the segmental distribution (by major intersections) in the project area, and also refers the reader to the corresponding figures in *Chapter 2* for receptor locations. It should be mentioned here that there were no noise sensitive areas in Segment 15; therefore, no noise analysis was conducted, nor were there segment assignments for this area.

Table 3.15.2: Roadway Segment Location

Segment No.	Major Intersection	Figure 2-2.3
1	La Jolla Village Drive to Genesee Avenue	Sheets 1–4
2	Genesee Avenue to Carmel Mountain Road	Sheets 4–10
3	Carmel Mountain Road to Carmel Valley Road	Sheets 10–12
4	Carmel Valley Road to Del Mar Heights Road	Sheets 12–15
5	Del Mar Heights Road to Via de la Valle	Sheets 15–20
6	Via de la Valle to Lomas Santa Fe Drive	Sheets 20–23
7	Lomas Santa Fe Drive to Manchester Avenue	Sheets 23–26
8	Manchester Avenue to Birmingham Drive	Sheets 26–30
9	Birmingham Drive to Santa Fe Drive	Sheets 30–32
10	Santa Fe Drive to Encinitas Boulevard	Sheets 32–34
11	Encinitas Boulevard to Leucadia Boulevard	Sheets 34–37
12	Leucadia Boulevard to La Costa Avenue	Sheets 37–40
13	La Costa Avenue to Poinsettia Lane	Sheets 40–43
14	Poinsettia Lane to Palomar Airport Road	Sheets 43–47
15	Palomar Airport Road to Cannon Road	Sheets 47–49
16	Cannon Road to Tamarack Avenue	Sheets 49–52
17	Tamarack Avenue to Carlsbad Village Drive	Sheets 52–54
18	Carlsbad Village Drive to Vista Way (SR-78)	Sheets 54–56
19	Vista Way (SR-78) to Oceanside Boulevard	Sheets 56–60
20	Oceanside Boulevard to Mission Avenue	Sheets 60–62
21	Mission Avenue to SR-76	Sheets 62–64
22	SR-76 to Wire Mountain Road	Sheets 64–66

3.15.3 Environmental Consequences

Build Alternatives

Traffic noise levels were modeled using the LOS C traffic volumes to obtain the worst-case noise scenario. LOS C volumes of 1,800 vphpl were assumed for the build condition. There would be a difference of 3 dBA or less between the predicted No Build and build conditions for the vast majority of noise sensitive receptors, with one receptor experiencing a noise level increase as high as 12 dBA. These noise differences between the No Build and build conditions would be primarily due to the presence of HOV/Managed Lanes and expanding the outer lanes closer to the receptors in the build alternatives. The predicted 2030 peak hour $L_{eq}(h)$ at the representative receptors range from 57 to 82 dBA, which would exceed the NAC at most locations. Approximately 531 receptor locations would exceed the NAC under the build conditions prior to consideration of any noise abatement measures. In instances where the predicted exterior noise levels equal or exceed 75 dBA, abatement must be considered.

Section 3.15.4 below discusses the future traffic noise levels for the No Build and build conditions after all noise abatement measures have been considered. The resulting traffic noise levels are organized by roadway segment (please refer to *Table 3.15.2* above and corresponding figures in *Chapter 2*).

No Build Alternative

Traffic noise levels were modeled using the LOS C traffic volumes to obtain the worst-case noise scenario. The traffic volumes of on- and off-ramps under the No Build conditions were capped at 1,000 vphpl. Approximately 471 receptor locations, a majority of receptors, would exceed the NAC in 2030 under the No Build condition. At many of the receptor locations, the future peak noise levels for 2030 are predicted to increase 3 to 5 BA over existing peak hour noise levels. There would be no project-related noise impacts under the No Build condition.

3.15.4 Avoidance, Minimization, and/or Mitigation Measures

Measures to Abate Highway Traffic Noise

Soundwall heights from 8 ft up to 16 ft were considered to abate the predicted traffic noise impacts at the representative noise sensitive areas within the proposed project area. Soundwalls were modeled to reduce traffic noise levels by at least the minimum requirement of 5 dB. In addition, the soundwall heights were modeled to block the line-of-sight to heavy truck exhaust stacks. The Noise Study Report identified 82 feasible soundwalls totaling a length of approximately 21 mi to abate for traffic noise impacts. These soundwalls were then further evaluated for feasibility and reasonableness to construct.

Feasibility and Reasonableness of Recommended Soundwalls (Decision for Noise Abatement)

A preliminary NADR was prepared in June 2007 to further evaluate the 82 feasible soundwalls identified in the Noise Study Report. The preliminary NADR is incorporated into this document by reference. The purpose of the preliminary NADR is to document the process in deciding the overall feasibility and reasonableness of providing abatement measures. The preliminary NADR presents the preliminary noise abatement decision based on the acoustical and non-acoustical feasibility factors, and the relationship between noise abatement allowances and the cost estimates.

The preliminary NADR does not present the final decision regarding noise abatement, but rather presents key information on abatement to be considered based on the available information at the time of Draft EIR/EIS circulation for public review. The final overall reasonableness decision would consider the reasonableness factors mentioned above, as well as comments received during the public review period. Additionally, if pertinent parameters change, such as vertical and/or horizontal alignment or an increase in reasonable allowance, during the final project design, the results of the preliminary noise abatement design may also change. That is, abatement features, such as berms or walls, could be added or deleted based on final project design and changes in the dollar amount of the reasonable allowance.

The following section summarizes the existing and future predicted noise levels for the No Build and build conditions, soundwall analyses, estimated costs, and preliminary abatement decisions for each roadway segment designated in *Table 3.15.2.* For outdoor land use areas such as schools and parks, 100-ft "frontage units" were totaled for use in consideration of cost effectiveness. Street addresses representing the noise receptor locations are also provided. All soundwall heights and locations are based on the latest available drawings and elevation information as of the time of the Noise Study Report and preliminary NADR. Details on the estimated costs for each soundwall can be found in the preliminary NADR. The Computer Noise Modeling Input/Output files for Calibration, No Build, Build, and Design for each segment can be found in Appendix D of the Noise Study Report.

SEGMENT 1 – La Jolla Village Drive to Genesee Avenue

Areas with Noise Abatement

Table 3.15.3 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB insertion loss (I.L.). *Table 3.15.4* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 1 are shown in the Project Features Maps in *Chapter 2* (*Figures 2-2.3, Sheets 1* through *4).* The following paragraphs describe the preliminary abatement decisions for Segment 1.

Soundwall S475: Soundwall S475 would be located on a frontage road along the southbound side of I-5 just north of La Jolla Village Drive. The soundwall would provide a feasible reduction in highway traffic noise for the outdoor use area of two university housing units, represented by Receptor R1.4. The common outdoor use area for this complex is behind the laundromat building. The existing 5.5-ft property wall already provides the required abatement from highway traffic noise, except for Receptors R1.2 to R1.4. Soundwalls modeled for these receptors did not meet the feasible reduction criteria, except for Receptor R1.4. However, constructing Soundwall S475 for R1.4 would not be reasonable due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.4*). Therefore, construction of Soundwall S475 would not be recommended.

Areas without Noise Abatement

Receptor R1.1: Receptor R1.1 is located on the southbound side of I-5, south of Voigt Drive. Receptor R1.1 is not currently experiencing traffic noise levels approaching or exceeding the NAC for Category B receivers, nor would predicted noise levels approach or exceed the NAC with the proposed project. Therefore, no abatement would be required (*Table 3.15.3*).

Receptor R1.5: Receptor 1.5 is located on the southbound side of I-5, south of Voigt Drive. Future predicted noise levels for Receptor R1.5 would not exceed the NAC for Category B receivers with the No Build alternative (*Table 3.15.3*). Future predicted noise levels for Receptor R1.5 would exceed the NAC with the build alternatives; however, it would not meet the feasible reduction criteria for noise abatement.

Receptors R1.6 and R1.7: Receptors R1.6 and R1.7 represent a baseball field at the east side of I-5 and south of Voigt Drive. A soundwall at the right-of-way line was considered for this area, but it would not be feasible to construct because there is a park and ride facility between the baseball field and I-5 (*Table 3.15.3*). There are no future noise impacts predicted for Receptor R1.7 with the proposed build alternatives.

Table 3.15.3: Predicted Future Noise Levels and Soundwall Feasibility for Segment 1

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
La Jolla Village Drive to Genesee Avenue - SB															
R1.1	Pepper Canyon Apartments – Student Housing	61	62	64 N	63	1	63	1	62	2	62	2	62	2	Not Feasible
R1.2	Pepper Canyon Apartments – Student Housing	66	67	69 A/E	68	1	68	1	67	2	66	3	65	4	Not Feasible
R1.3	Pepper Canyon Apartments – Student Housing	71	72	74 A/E	74	0	73	1	72	2	72	2	70	4	Not Feasible
R1.4	Pepper Canyon Apartments – Student Housing	70	71	73 A/E	73 T	0	72	1	71	2	69	4	**68 R**	**5**	S475 / Feasible
R1.5	Pepper Canyon Apartments – Student Housing	64	65	68 A/E	66	2	66	2	65	3	65	3	64	4	Not Feasible
La Jolla Village Drive to Genesee Avenue – NB															
R1.6	Baseball Diamond	62	63	66 A/E	65	1	64	2	64	2	64	2	64	2	Not Feasible
R1.7	Baseball Diamond	61	62	64 N	--	--	--	--	--	--	--	--	--	--	--

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels
[2] – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
N – No noise impact.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – Includes the benefits of an existing soundwall / property wall.

Table 3.15.4: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 1

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location/ Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S475	R1.4	2 UH Units	Frontage Road / SB	16 ft / 1178 ft	$1,140,388	$96,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; UH – University Housing

SEGMENT 2 – Genesee Avenue to Carmel Mountain Road

Areas with Noise Abatement

Table 3.15.5 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.6* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 2 are shown in *Chapter 2* (*Figures 2-2.3, Sheets 4* through *10*. The following paragraphs describe the preliminary abatement decisions for Segment 2.

Soundwall S518: Soundwall S518 would be located on private property and Caltrans right-of-way on the northbound side of I-5, just south of Carmel Mountain Road. The soundwall would provide a feasible reduction in highway traffic noise for 30 multi-family residences represented by Receptors R2.1 through R2.5. Soundwall S518 would replace an existing 6-ft-high glass/block property wall located on the right-of-way. Soundwall S518 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.6*). Cost of acquisition for right-of-way is assumed to be $349,315 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S518 would not be recommended (*Table 3.15.6).*

Areas without Noise Abatement

There are no noise sensitive areas in Segment 2 that would be impacted by the proposed project where abatement would not be feasible.

Table 3.15.5: Predicted Future Noise Levels and Soundwall Feasibility for Segment 2

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" Without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Genesee Avenue to Carmel Mountain Road – NB															
R2.1[W]	Torrey Villa Resort Apartments	68	69	70 [A/E]	67	3	**65**[R]	**5**	63	7	62	8	61	9	S518 / Feasible
R2.2[W]	Torrey Villa Resort Apartments	68	69	70 [A/E]	68	2	66	4	**65**[R]	5	63	7	62	8	S518 / Feasible
R2.3[W]	Torrey Villa Resort Apartments	69	70	70 [A/E]	68	2	66	4	**64**[R]	6	62	8	61	9	S518 / Feasible
R2.4[W]	Torrey Villa Resort Apartments	69	70	70 [A/E]	68	2	65	5	**63**[R]	**7**	62	8	61	9	S518 / Feasible
R2.5[W]	Torrey Villa Resort Apartments	65	66	66 [A/E]	64	2	62	4	**61**[R]	**5**	60	6	59	7	S518 / Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.2 – Traffic noise from the freeway only; other local noise sources are not included.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – Includes the benefits of an existing property wall.

Table 3.15.6: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 2

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location/ Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S518	R2.1-R2.5	30 MFR	R/W and Private Property / NB	10 ft to 12 ft /1404 ft	$1,433,640	$1,140,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence.
[2] – Estimated construction cost includes cost of easements.
R/W – right-of-way

SEGMENT 3 – Carmel Mountain Road to Carmel Valley Road

Areas with Noise Abatement

Table 3.15.7 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.8* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 3 are shown in *Figures 2-2.3, Sheets 10* through *12*. The following paragraphs describe the preliminary abatement decisions for Segment 3.

Soundwall S526: Soundwall S526 would be located on private property and Caltrans right-of-way along the northbound side of I-5, north of Carmel Mountain Road. The soundwall would provide a feasible reduction in highway traffic noise for 28 single-family residences represented by receptors R3.2 through R3.10, and R3.10A (*Table 3.15.7*). The soundwall would replace an existing 6-ft-high glass/block property wall. Construction of S526 would not be reasonable due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.8*). Therefore, construction of Soundwall S526 would not be recommended (*Table 3.15.8).*

Soundwall S528: Soundwall S528 would be located on private property along the northbound side of I-5, north of Carmel Mountain Road. The soundwall would replace an existing 6-ft-high glass/block property wall. The soundwall would provide a feasible reduction in highway traffic noise for two single-family residences represented by Receptors R3.13 and R3.14 *(Table 3.15.7*). Soundwall S528 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable cost allowance. Therefore, Soundwall S528 would not be recommended (*Table 3.15.8*).

Areas without Noise Abatement

Receptors R3.1 and R3.1A: Receptors R3.1 and R3.1A are not currently experiencing traffic noise levels approaching or exceeding the NAC for Category B receivers, nor would predicted noise levels approach or exceed the NAC with or without the proposed project (*Table 3.15.7*). Therefore, no abatement would be required.

Receptors R3.11 and R3.12: These receptors are not currently experiencing traffic noise levels approaching or exceeding the NAC for Category B receivers, nor would predicted noise levels approach or exceed the NAC with or without the proposed project (*Table 3.15.7*). Therefore, no abatement would be required.

Table 3.15.7: Predicted Future Noise Levels and Soundwall Feasibility for Segment 3

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Carmel Mountain Road to Carmel Valley Road – NB															
R3.1[W]	13777 Torrey View Court	59	62	62	--	--	--	--	--	--	--	--	--	--	--
R3.1A[W]	13763 Torrey View Court	62	65	65	--	--	--	--	--	--	--	--	--	--	--
R3.2[W]	13759 Torrey View Court	63	66	66 [A/E]	64[T]	2	**61[R]**	**5**	59	7	58	8	57	9	S526 / Feasible
R3.3[W]	13735 Torrey View Court	64	67	68 [A/E]	65[T]	3	**63[R]**	**5**	61	7	60	8	59	9	S526 / Feasible
R3.4[W]	13715 Torrey View Court	65	68	69 [A/E]	66[T]	3	**64[R]**	**5**	63	6	61	8	60	9	S526 / Feasible
R3.5*[W]	13719 Torrey View Court	55	58	58 [N]	58	0	57	1	56	2	55	3	55	3	--
R3.6[W]	13707 Torrey View Court	67	70	71 [A/E]	67[T]	4	**65[R]**	**6**	63	8	61	10	61	10	S526 / Feasible
R3.7[W]	13699 Torrey View Court	60	63	64 [N]	62	2	61	3	60	4	60	4	59	5	--
R3.8[W]	13690 Torrey View Court	64	65	66 [A/E]	64[T]	2	62	4	**61[R]**	**5**	59	7	58	8	S526 / Feasible
R3.9[W]	13680 Torrey View Court	67	68	69 [A/E]	65[T]	4	63	6	61	8	**60[R]**	**9**	59	10	S526 / Feasible
R3.10[W]	13676 Torrey View Court	70	71	72 [A/E]	69[T]	3	67	5	64	8	**63[R]**	**9**	62	10	S526 / Feasible
R3.10A[W]	13670 Torrey View Court	68	66	66 [A/E]	65[T]	1	63	3	62	4	**61[R]**	**5**	60	6	S526 / Feasible
R3.11[W]	13664 Torrey View Court	64	65	65 [N]	63	2	62	3	61	4	60	5	59	6	--
R3.12[W]	13654 Torrey View Court	63	64	65 [N]	63	2	61	4	60	5	59	6	58	7	--
R3.13[W]	13648 Torrey View Court	66	67	67 [A/E]	64[T]	3	**62[R]**	**5**	60	7	59	8	58	9	S528 / Feasible
R3.14[W]	13652 Torrey View Court	64	65	65 [N]	63	2	62	3	60	5	59	6	58	7	--

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[N] – No noise impact.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – Includes the benefits of an existing 6-ft high property wall.
* Non first-row receiver

Table 3.15.8: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 3

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S526	R3.2 - R3.10A	28 SFR	R/W and Private Property / NB	10 ft to 14 ft / 1893 ft	$2,004,741	$1,120,000	Not Reasonable	Not Recommended
S528	R3.13 – R3.14	2 SFR	Private Property / NB	10 ft / 381 ft	$380,702	$68,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence
[2] – Estimated construction cost includes cost of easements
R/W – right-of-way

SEGMENT 4 – Carmel Valley Road to Del Mar Heights Road

Areas with Noise Abatement

Table 3.15.9 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 B I.L. *Table 3.15.10* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 4 are shown in *Figures 2-2.3, Sheets 12* through*15*. The following paragraphs describe the preliminary abatement decisions for Segment 4.

Soundwall S541: Soundwall S541 would be located on the southbound side of I-5 on private property, north of Carmel Valley Road. The soundwall would provide a feasible reduction in highway traffic noise for the recreational area of a gated housing community, comprised of a pool and tennis courts, represented by Receptors R4.2 and R4.4 (*Table 3.15.9*). Soundwall S541 would not provide a feasible noise reduction for Receptor R4.3 because the elevation of R4.3 would be approximately 13 ft higher than the proposed soundwall. Soundwall S541 would replace an existing 6- to 7-ft-high property wall located on the property line. Soundwall S541 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.10*). Therefore, construction of Soundwall S541 would not be recommended (*Table 3.15.10*).

Soundwall S543: Soundwall S543 would be located on the southbound side of I-5 on private property, north of Carmel Valley Road. The soundwall would provide a feasible reduction in highway traffic noise for six multi-family residences represented by Receptor R4.5 and is considered feasible *(Table 3.15.9*). It would replace the eastern side of an existing 7.5-ft high glass/block property wall located on the property line. Soundwall S543 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.10).* Cost of acquisition for right-of-way is assumed to be $94,010 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If the estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S543 would not be recommended (*Table 3.15.10).*

Soundwall S551: Soundwall S551 would be located on the southbound side of I-5 on private property between Carmel Valley Road and Del Mar Heights Road. The soundwall would provide a feasible reduction in highway traffic noise for 51 single-family residences represented by Receptors R4.11 through R4.21, and would be feasible (*Table 3.15.9*). It would replace an existing 7-ft-high glass/block property wall located on the property line. Soundwall S551 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance *(Table 3.15.10*). Therefore, Soundwall S551 would not be recommended (*Table 3.15.10*). However, Receptor R4.11 would be severely impacted with highway traffic noise levels at or higher than 75 dBA with the proposed build alternatives, and would require abatement (*Table 3.15.9*). It would be recommended that interior abatement be provided for R4.11 and the existing glass/block wall would be left in place. No further abatement would be provided.

Soundwall S557: Soundwall S557 would be located on the southbound side of I-5 on private property south of Del Mar Heights Road. The soundwall would provide a feasible reduction in highway traffic noise for 10 multi-family residences represented by Receptors R4.22A, R4.23, and R4.24, and is considered feasible (*Table 3.15.9*). Soundwall S557 would not be reasonable

due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.10*). Therefore, Soundwall S557 would not be recommended as proposed (*Table 3.15.10*). However, Receptor R4.23 would be severely impacted, with highway traffic noise levels at or higher than 75 dBA with the proposed build alternatives, and would require abatement (*Table 3.15.9*). It would, therefore, be recommended that Receptor R4.23 receive individual abatement.

Areas without Noise Abatement

Receptor R4.1: Receptor R4.1 represents a single-family residence in a gated community on the southbound side of I-5, just north of Carmel Valley Road. A soundwall located on the shoulder or the right-of-way would not be feasible due to the elevation at the residence. Constructing a soundwall on private property to provide abatement for one residence would also not be practical (*Table 3.15.9).*

Receptors R4.6 through R4.10: Receptors R4.6 through R4.10 represent a group of multi-family residences on the southbound side of I-5, north of Carmel Valley Road. Receptors R4.6 through R4.8 are protected by an existing 15-ft high soundwall. A soundwall at this location would not provide the required 5 dBA noise reduction; therefore, abatement would not be feasible (*Table 3.15.9).*

Receptor R4.22: Receptor R4.22 represents a single-family residence on the southbound side of I-5, south of Del Mar Heights Road. Soundwall S551 would not provide a feasible noise reduction for this receptor (*Table 3.15.9*).

Table 3.15.9: Predicted Future Noise Levels and Soundwall Feasibility for Segment 4

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Carmel Valley Road to Del Mar Heights Road – SB															
R4.1	13538 Caminito Carmel	68	71	72 A/E	72	0	71	1	71	1	71	1	71	1	Not Feasible
R4.2W	12943 Caminito Pointe Del Mar	69	72	72 A/E	70T	2	**67R**	**5**	65	7	63	9	62	10	S541 / Feasible
R4.3W	12943 Caminito Pointe Del Mar	70	73	73 A/E	73	0	72	1	71	2	71	2	70	3	Not Feasible
R4.4W	13933 Caminito Pointe Del Mar	67	70	71 A/E	69T	2	**66R**	**5**	64	7	62	9	61	10	S541 / Feasible
R4.5W	2784 Caminito San Marino	69	72	73 A/E	72T	1	71	2	69	4	**67R**	**6**	66	7	S543 / Feasible
R4.6WZ	2783 Caminito Cedros	65	68	69 A/E	--	--	--	--	--	--	--	--	67	2	--
R4.7W,Z	2766 Caminito San Pablo	63	66	67 A/E	--	--	--	--	--	--	--	--	67	0	--
R4.8W,Z	2777 Caminito El Dorado	62	65	66 A/E	--	--	--	--	--	--	--	--	65	1	--
R4.9W,Z	13080 Caminito Cristobal	68	67	67 A/E	--	--	--	--	--	--	66	1	67	0	--
R4.10W,Z	13110 Portofino Drive	66	65	66 A/E	66	0	65	1	65	1	65	1	65	1	Not Feasible
R4.11W	13131 Portofino Drive	74	74	75 A/E	74T	1	71	4	**68R**	**7**	66	9	65	10	S551 / Feasible
R4.12W	13163 Portofino Drive	72	72	73 A/E	72T	1	67	3	**68R**	**5**	67	6	65	8	S551 / Feasible
R4.13W	13231 Portofino Drive	69	69	69 A/E	68T	1	67	2	65	4	**64R**	**5**	64	5	S551 / Feasible
R4.14W	13303 Portofino Drive	69	69	70 A/E	69T	1	67	3	66	4	**65R**	**5**	64	6	S551 / Feasible
R4.15W	13333 Portofino Drive	68	69	69 A/E	69T	0	67	2	65	4	**64R**	**5**	64	5	S551 / Feasible
R4.16W	13363 Portofino Drive	68	69	70 A/E	69T	1	67	3	65	5	**64R**	**6**	63	7	S551 / Feasible
R4.17W	13395 Portofino Drive	67	68	69 A/E	68T	1	67	2	65	4	**64R**	**5**	63	6	S551 / Feasible
R4.18W	13451 Portofino Drive	67	68	69 A/E	68T	1	67	2	65	4	**64R**	**5**	63	6	S551 / Feasible
R4.19W	13505 Portofino Drive	68	69	70 A/E	69T	1	67	3	65	5	**64R**	**6**	63	7	S551 / Feasible
R4.20W	13555 Portofino Drive	68	69	69 A/E	68T	1	67	2	65	4	**64R**	**5**	63	6	S551 / Feasible
R4.21W	13603 Portofino Drive	68	69	69 A/E	68T	1	67	2	65	4	**64R**	**5**	63	6	S551 / Feasible
R4.22W	13651 Portofino Drive	67	68	69 A/E	68T	1	67	2	66	3	65	4	65	4	S551 / Not Feasible
R4.22A	Casa Del Mar Apartments - Ruette Le Parc	71	71	71 A/E	68T	3	**66R**	**5**	64	7	62	9	61	10	S557 / Feasible
R4.23	Casa Del Mar Apartments - Ruette Le Parc	77	77	78 A/E	73T	5	**71R**	**7**	69	9	66	12	65	13	S557 / Feasible
R4.24	Casa Del Mar Apartments - Ruette Le Parc	72	72	73 A/E	69T	4	**66R**	**7**	63	10	62	11	61	12	S557 / Feasible

1 – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
2 – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – Includes the benefits of an existing soundwall/property wall.
Z – Receivers R4.6 through R4.9 are behind an existing 11- to 15-ft high soundwall; therefore, a soundwall of lesser height has been considered for these receivers.

Table 3.15.10: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 4

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S541	R4.2 and R4.4	1 REC (4 Frontage Units)	Private Property / SB	10 ft / 571 ft	$586,292	$152,000	Not Reasonable	Not Recommended
S543	R4.5	6 MFR	Private Property / SB	14 ft / 259 ft	$324,382	$300,000	Not Reasonable	Not Recommended
S551	R4.11-R4.22	51 SFR	Private Property / SB	12 ft to 14 ft / 3615 ft	$4,462,391	$2,550,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]
S557	R4.22A, R4.23, and R4.24	10 MFR	Private Property / SB	10 ft / 889 ft	$828,681	$400,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted

SEGMENT 5 – Del Mar Heights Road to Via de la Valle Undercrossing

Areas with Noise Abatement

Table 3.15.11 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.12* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 5 are shown in *Figures 2-2.3, Sheets 15* through *20*. The following paragraphs describe the preliminary abatement decisions for Segment 5.

Soundwall S561: Soundwall S561 would be located along the southbound side of I-5, north of Del Mar Heights Road. This soundwall would provide a feasible reduction in highway traffic noise for six multi-family residences represented by Receptors R5.1 and R5.2 (*Table 3.15.11*). Soundwall S561 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, construction of Soundwall S561 would not be recommended (*Table 3.15.12).*

Soundwall S563: Soundwall S563 would be located along the southbound side of I-5 north of Del Mar Heights Road. Soundwall S563 would provide a feasible reduction in highway traffic noise for the outdoor use area at Del Mar Hills Academy, represented by Receptor R5.3 (*Table 3.15.11*). Soundwall S563 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, Soundwall S563 would not be recommended (*Table 3.15.12*).

Soundwall S565: Soundwall S565 would be located along the southbound side of I-5, north of Del Mar Heights Road. This soundwall would provide a feasible reduction in highway traffic noise for Del Mar Hills Academy, represented by Receptors R5.5 and R5.6, and would be considered feasible (*Table 3.15.11*). Soundwall S565 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, construction of Soundwall S565 would not be recommended (*Table 3.15.12*).

Soundwall S567: Soundwall S567 would be located along the southbound side of I-5, north of Del Mar Heights Road. The soundwall would provide a feasible reduction in highway traffic noise for seven single-family residences, represented by Receptors R5.7A, R5.8, and R5.8A (*Table 3.15.11*). Soundwall S567 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Cost of acquisition for right-of-way is assumed to be $96,670 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If the estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S567 would not be recommended (*Table 3.15.12*).

Soundwall S568: Soundwall S568 would be located on the right-of-way and on private property along the northbound side of I-5, north of Del Mar Heights Road. This soundwall would provide a feasible reduction in highway traffic noise for 11 single-family residences, represented by Receptors R5.21 to R5.23 (*Table 3.15.11*). Soundwall S568 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, Soundwall S568 would not be recommended (*Table 3.15.12*).

Soundwall S569: Soundwall S569 would be located along the southbound side of I-5, north of Del Mar Heights Road. The soundwall would provide a feasible reduction in highway traffic noise for three single-family residences, represented by Receptor R5.9 (*Table 3.15.11*). Soundwall S569 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, Soundwall S569 would not be recommended (*Table 3.15.12*).

Soundwall S573: Soundwall S573 would be located along the southbound side of I-5, between Del Mar Heights Road and Via de la Valle. The soundwall would provide a feasible reduction in highway traffic noise for eight single-family residences, represented by Receptors R5.10 to R5.14 (*Table 3.15.11*). Construction of Soundwall S573 could potentially create an adverse visual impact, as it would block scenic views of the ocean for motorists traveling on I-5. Soundwall S573 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, Soundwall S573 would not be recommended (*Table 3.15.12*).

Soundwall S589: Soundwall S589 would be located along the southbound side of I-5, just south of Via de la Valle. The wall would provide feasible abatement for three recreational areas, represented by Receptors R5.24 to R5.26 (*Table 3.15.11*). Soundwall S589 would not be reasonable due to the estimated construction cost exceeding the reasonable cost allowance (*Table 3.15.12*). Therefore, Soundwall S589 would not be recommended (*Table 3.15.12*).

Areas without Noise Abatement

Receptor R5.7: Receptor R5.7 represents a single-family residence located on the southbound side of I-5, north of Del Mar Heights Road. It would not be feasible to abate highway traffic noise due to elevation differences between the right-of-way and the residence (*Table 3.15.11*). Additionally, a soundwall on the property line would not be feasible due to elevation differences between the property line and the residence's outdoor use area.

Receptor R5.15: Receptor R5.15 represents a single-family residence located on the southbound side of I-5, north of Del Mar Heights Road. Soundwall S753 would not provide a feasible noise reduction for this residence (*Table 3.15.11).*

Receptors R5.17 to R5.20: Receptors R5.17 to R5.20 are located on the northbound side of I-5, north of Del Mar Heights Road. The existing 10-ft-high property wall already provides the required abatement from highway traffic noise, except for R5.17. However, a soundwall modeled in place of the existing property wall would not meet the required 5 dB noise reduction to be considered feasible for R5.17 (*Table 3.15.11*).

Table 3.15.11: Predicted Future Noise Levels and Soundwall Feasibility for Segment 5

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Location Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Del Mar Heights Road to Via de la Valle Undercrossing – SB															
R5.1	14031 Mango Drive – Bella Del Mar Apartment Homes	70	71	73 A/E	**67 R,T**	**6**	65	8	64	9	63	10	62	11	S561 / Feasible
R5.2	14065 Mango Drive – Bella Del Mar Apartment Homes	71	72	74 A/E	**68 R,T**	**6**	66	8	64	10	63	11	62	12	S561 / Feasible
R5.3 W	14085 Mango Drive – Del Mar Hills Academy Playground	68	69	71 A/E	68 T	3	67	4	**66 R**	**5**	65	6	65	6	S563 / Feasible
R5.4 O,W	14085 Mango Drive – Del Mar Hills Academy	64	65	67 A/E	66	1	65	2	65	2	65	2	64	3	--
R5.5	14085 Mango Drive – Del Mar Hills Academy – Athletic Field	68	69	71 A/E	65 T	6	**64 R**	**7**	63	8	62	9	62	9	S565 / Feasible
R5.6	14085 Mango Drive – Del Mar Hills Academy – Athletic Field	69	70	72 A/E	68 T	4	**67 R**	**5**	67	5	67	5	66	6	S565 Feasible
R5.7	14175 Minorca Cove	72	71	73 A/E	--	--	--	--	--	--	--	--	--	--	Not Feasible
R5.7A	14243 Minorca Cove	72	71	73 A/E	**67 R,T**	**6**	66	7	65	8	64	9	64	9	S567 / Feasible
R5.8	14251 Minorca Cove	72	71	72 A/E	**66 R,T**	**6**	64	8	62	10	61	11	60	12	S567 / Feasible
R5.8A	14269 Minorca Cove	70	69	71 A/E	**65 R,T**	**6**	65	6	64	7	63	8	63	8	S567 Feasible
R5.9	14295 Minorca Cove	71	70	72 A/E	72	0	72	0	71 T	1	69	3	**67 R**	**5**	S569 / Feasible
R5.10	13413 Racetrack View Court	68	73	73 A/E	70 T	3	69	4	**68 R**	**5**	67	6	67	6	S573 / Feasible
R5.11	13433 Racetrack View Court	66	71	70 A/E	67 T	3	66	4	**65 R**	**5**	65	5	64	6	S573 / Feasible
R5.12	3053 Racetrack View Court	65	70	70 A/E	67 T	3	66	4	**65 R**	**5**	65	5	64	6	S573 / Feasible
R5.13	3073 Racetrack View Court	63	68	68 A/E	65 T	3	64	4	64	4	**63 R**	**5**	63	5	S573 / Feasible
R5.14	3093 Racetrack View Court	62	67	68 A/E	65 T	3	64	4	64	4	**63 R**	**5**	63	5	S573 / Feasible
R5.15	3080 Racetrack View Court	62	67	67 A/E	65 T	2	64	3	64	3	63	4	63	4	Not Feasible
R5.16 W	Bella Del Mar Apartments – Voyager Circle	67	68	70 A/E	67	3	65	5	64	6	62	8	61	9	Not Feasible
R5.16A W,K	Bella Del Mar Apartments – Voyager Circle	59	60	62 N	--	--	--	--	--	--	--	--	--	--	--
Del Mar Heights Road to Via de la Valle Undercrossing – NB															
R5.17 W	3355 Lower Ridge Road	63	64	66 A/E	--	--	--	--	64	2	62	4	62	4	Not Feasible
R5.18 W	3295 Lower Ridge Road	62	63	65 N	--	--	--	--	--	--	--	--	--	--	--
R5.19 W	13126 Windbreak Road	62	63	65 N	--	--	--	--	--	--	--	--	--	--	--
R5.20 W	3404 Lady Hill Road	61	62	63 N	--	--	--	--	--	--	--	--	--	--	--
R5.21	13204 Ocean Vista Road	65	67	69 A/E	66 T	3	65	4	65	4	**64 R**	**5**	63	6	S568 / Feasible
R5.22	13212 Ocean Vista Road	68	70	72 A/E	**67 R,T**	**5**	66	6	64	8	63	9	62	10	S568 / Feasible
R5.23	13228 Ocean Vista Road	70	72	74 A/E	**68 R,T**	**6**	66	8	64	10	62	12	61	13	S568 / Feasible

Table 3.15.11 (cont.): Predicted Future Noise Levels and Soundwall Feasibility for Segment 5

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Location Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Del Mar Heights Road to Via de la Valle Undercrossing – SB															
R5.24	Mini Golf Course – Jimmy Durante Boulevard	74	74	74 A/E	71 T	3	70	4	**69 R**	5	68	6	67	7	S589 / Feasible
R5.25	Surf -N-Turf RV Park – Jimmy Durante Boulevard	74	74	74 A/E	70 T	4	69	5	**68 R**	6	67	7	66	8	S589 / Feasible
R5.26	Surf -N-Turf RV Park – Jimmy Durante Boulevard	71	71	71 A/E	69	2	68	3	67 T	4	**66 R**	**5**	65	6	S589 / Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
M – This receptor represents a measurement site. It is not an area of frequent human use.
N – No noise impact.
O – Outdoor measurement site at school.
K – A shielding factor of 5 dB has been applied to Receptor 5.16A to account for attenuation provided by first-row buildings.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – The existing and future no build noise levels at this receiver include the benefits of an existing property wall.

Table 3.15.12: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 5

Soundwall No	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S561	R5.1 – R5.2	6 MFR	Private Property / SB	8 ft / 492 ft	$407,215	$240,000	Not Reasonable	Not Recommended
S563	R5.3	1 SCH (3 Frontage Units)	School Property / SB	12 ft / 318 ft	$357,592	$144,000	Not Reasonable	Not Recommended
S565	R5.5 – R5.6	1 SCH (4 Frontage Units)	School Property / SB	10 ft / 364 ft	$344,879	$200,000	Not Reasonable	Not Recommended
S567	R5.7A, R5.8, R5.8A	7 SFR	R/W / SB	8 ft / 459 ft	$348,948	$336,000	Not Reasonable	Not Recommended
S568	R5.21 – R5.23	11 SFR	R/W and Private Property / SB	8 ft to 14 ft / 709 ft	$675,865	$440,000	Not Reasonable	Not Recommended
S569	R5.9	3 SFR	R/W / SB	16 ft / 253 ft	$311,330	$138,000	Not Reasonable	Not Recommended
S573	R5.10 – 5.14	8 SFR	Shoulder / SB	12 ft to 14 ft / 2133 ft	$1,396,532	$304,000	Not Reasonable	Not Recommended
S589	R5.24 – R5.26	3 REC (8 Frontage Units)	Shoulder / SB	12 ft to 14 ft / 1844 ft	$964,869	$384,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
R/W – right-of-way

SEGMENT 6 – Via de la Valle Undercrossing to Lomas Santa Fe Drive

Areas with Noise Abatement

Table 3.15.13 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.14* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 6 are shown in *Figures 2-2.3, Sheets 20* through *23*. The following paragraphs describe the preliminary abatement decisions for Segment 6.

Soundwall S602 (Option 1): Soundwall S602 would be located on private property and Caltrans right-of-way along the northbound side of I-5, north of Del Mar Heights Road. The soundwall would provide a feasible reduction in highway traffic noise for 10 single- and 20 multi-family residences, represented by Receptors R6.12A and R6.12 to R6.21 (*Table 3.15.13*). Soundwall S602 Option 1 would not provide feasible noise reduction for Receptors R6.12B, R6.13A, and R6.15; and Receptor R6.14A would not be impacted by freeway noise (*Table 3.15.13*). Soundwall S602 Option 1 would not be reasonable to construct due to the estimated construction cost exceeding the total reasonable allowance (*Table 3.15.14*). Therefore, Soundwall S602 Option 1 would not be recommended as proposed (*Table 3.15.14*). Since Receptors R6.12A, R6.17, R6.19, and R6.20 are predicted to be severely impacted by future traffic noise levels at or higher than 75 dBA with the proposed build alternatives, abatement must be provided. Since this wall would potentially block scenic ocean views for nearby residences, a second option, Option 2, would be proposed.

Soundwall S602 (Option 2): Soundwall S602 Option 2 would be a shorter wall located on Caltrans right-of-way along the northbound side of I-5, north of Via de la Valle. This soundwall would provide a feasible reduction in highway traffic noise for six single-family residences, represented by Receptors R6.17A and R6.17 to R6.20, of which Receptors R6.17, R6.19, and R6.20 would be severely impacted under the proposed build alternatives (*Table 3.15.13*). Soundwall 602 Option 2 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.14*). However, abatement would be required for the three severely impacted receptors, represented by R6.17, R6.19, and R6.20. Therefore, the preliminary recommendation would be to construct S602 Option 2 to abate highway traffic noise only for the severely impacted residences (*Table 3.15.14*). Individual abatement would be provided for severely impacted residences represented by Receptor R6.12A.

Soundwall S603 (Option 1): Soundwall S603 Option 1 would be located along the southbound side of I-5, north of Via de la Valle. The soundwall, as proposed in the Draft EIR/EIS, would provide a feasible reduction in highway traffic noise for 14 single-family and 20 multi-family residences, as well as St. Leo's Head Start Pre School and Santa Fe Christian School, all represented by Receptors R6.4A and R6.4 to R6.11 (*Table 3.15.13*). The estimated construction cost of S603 (Option 1) including all easement costs, would be less than the reasonable cost allowance, and so would be reasonable (*Table 3.15.14*). For purposes of the noise analysis, the solid soundwall has been identified in *Table 3.15.13*. A solid soundwall, however, would have the potential to block scenic coastal views for freeway motorists protected under the Coastal Act. For that reason, and based on general comments received on loss of potential ocean views during public review of the Draft EIR/EIS and Supplemental Draft EIR/EIS, as well as coordination with the CCC, it is now recommended to create a gap in the

Soundwall S603 (Option 1) to maintain the coastal view (see Soundwall S603 [Option 1A], below). The potential visual impacts are further discussed in *Section 3.7, Visual/Aesthetics*. Soundwall S603 Option 1 is not recommended (*Table 3.15.14*).

Soundwall S603 (Option 1A): As discussed above, Soundwall S603 (Option 1A) would create a gap in Soundwall S603 (Option 1). This would divide the soundwall into S603A and S603B, and would retain the potential for a coastal view in this area. The gap would start at Station 601+00 and would end at Station 605+00 (see *Figures 2-2.3, Sheets 22* and *23*).

Soundwall S603A would provide a feasible reduction in highway traffic noise for 12 multi-family residences, represented by Receptors R6.4A and R6.4, and 1 single-family residence, represented by Receptor R6.5. Soundwall S603B would provide a feasible reduction in highway traffic noise for four multi-family residences, represented by Receptor R6.9A, as well as Santa Fe Christian School, represented by Receptors R6.10 and R6.11, which counts for seven frequent human-use areas. Receptors R6.6 through R6.9 would not receive a feasible noise reduction with the gap in the soundwall (*Table 3.15.13*). The estimated construction cost of S603A and S603B, including all easement costs, would be less than the reasonable cost allowance. Therefore, Soundwalls S603A and S603B are preliminarily recommended. The potential visual impacts are further discussed in *Section 3.7, Visual/Aesthetics,* under Key View 3.

Soundwall S603 (Option 2): Soundwall S603 Option 2 would be located on private property along the southbound side of I-5, north of Via de la Valle. This wall would provide a feasible reduction in highway traffic noise for three multi-family residences, represented by Receptors R6.9 and R6.9A (*Table 3.15.13*). In this option, Soundwall S603 would be partially founded on a proposed retaining wall. Soundwall S603 would not be reasonable due to the estimated construction costs exceeding the reasonable cost allowance (*Table 3.15.14*). Therefore, this option is not recommended (*Table 3.15.14*).

Areas without Noise Abatement

Receptors R6.1 through R6.2: Single- and multi-family residences, represented by Receptor R6.1, are located on the southbound side of I-5. It would not be feasible to abate for highway traffic noise for R6.1 due to elevation differences between the highway and the residences (*Table 3.15.13*). Receptor R6.2 is in a front yard and is not an outdoor use area, and the backyard for this area wound not be impacted. It was modeled because it was meant to be a calibration site; however, the noise data collected from this site were contaminated from other noise sources and was not used for calibration (*Table 3.15.13*).

Receptors R6.1A and R6.3: Future noise at these locations is not predicted to approach or exceed the NAC for these Category B receivers under the proposed build alternatives (*Table 3.15.13*).

Receptors R6.6 through R6.9A: 13 single-family and 8 multi-family residences, as well as St. Leo's Head Start Pre School, are represented by these receptors. As discussed above, a soundwall within this portion of the corridor would have the potential to block scenic coastal views, which are protected under the Coastal Act, for freeway motorists. A soundwall in this location is therefore not feasible.

Receptors R6.22 and R6.23: Santa Fe Montessori School is represented by Receptors R6.22 and R6.23 and is located on the northbound side of I-5. A soundwall within the right-of-way would not be feasible to construct because of elevation differences between the school and the right-of-way (*Table 3.15.13*). A soundwall on school property would not be feasible because the outdoor use area is located behind the school and a soundwall would not provide the required minimum 5 dB noise reduction (*Table 3.15.13*). Receptor R6.22 is located in the school's front parking lot and is not an outdoor use area, but it was modeled to aide in estimating existing noise levels in this area. Building acoustical treatment may need to be considered for this school due to the high exterior noise levels (74 dBA) at the facade of the building.

Receptors R6.24 and R6.25: Receptors R6.24 and R6.25 represent a single-family residence and a home office, located on the northbound side of I-5, south of Lomas Santa Fe Drive. These receptors are protected by an existing 12.8-ft-high glass-and-block wall specifically designed to reduce traffic noise at this property. A 14-ft-high and 16-ft-high soundwall proposed along the right-of-way, in front of R6.24 and R6.25, was modeled and did not meet the 5 dB reduction requirement to be considered feasible (*Table 3.15.13*).

Table 3.15.13: Predicted Future Noise Levels and Soundwall Feasibility for Segment 6

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Location Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Via de la Valle to Lomas Santa Fe Drive – SB															
R6.1	15808 Highland Court	66	66	68 A/E	67	1	67	1	66	2	66	2	65	3	Not Feasible
R6.1A	15834 Highland Court	60	60	62 N	--	--	--	--	--	--	--	--	--	--	--
R6.2	15863 Highland Court	65	65	67 A/E	67	0	66	1	64	3	64	3	63	4	Not Feasible
R6.3	15877 Highland Court	62	62	64 N	--	--	--	--	--	--	--	--	--	--	--
R6.4A	803 Highland Drive	67	67	72 A/E	**67**^{R,T}	**5**	66	6	65	7	65	7	64	8	S603[3] / Feasible
R6.4	804 Ida Avenue	71	76	80 A/E	**73**^{R,T}	**7**	71	9	70	10	69	11	68	12	S603[3] / Feasible
R6.5	828 Ida Avenue	64	69	74 A/E	69	5	**68**^{R}	**6**	67	7	67	7	66	8	S603[3] / Feasible
R6.6*	708 Castro Street	61	66	69 A/E	66	3	65^{T}	4	**64**^{R}	**5**	63	6	63	6	S603[3] / Feasible
R6.7*	709 Ida Avenue	64	69	71 A/E	68^{T}	3	67	4	**66**^{R}	**5**	65	6	64	7	S603[3] / Feasible
R6.7A	635 Ida Avenue	64	69	68 A/E	65^{T}	3	64	4	**63**^{R}	**5**	63	5	62	6	S603[3] / Feasible
R6.8	St Leo's Head Start Preschool – Playground	68	73	70 A/E	66^{T}	4	**65**^{R}	**5**	65	5	64	6	64	6	S603[3] / Feasible
R6.9	865 Mola Vista Way	69	74	74 A/E	70^{T}	4	**68**^{R}	**6**	67	7	66	8	65	9	S603[3] / Feasible
R6.9A	865 Mola Vista Way	67	73	73 A/E	69^{T}	4	**68**^{R}	**5**	66	7	65	8	65	8	S603[3] / Feasible
R6.10	838 Academy Drive - Santa Fe Christian	75	73	76 A/E	71	5	**70**^{R,T}	**6**	69	7	68	8	67	9	S603[3] / Feasible
R6.11	838 Academy Drive- Santa Fe Christian School	76	74	75 A/E	73	2	**70**^{R,T}	**5**	68	7	67	8	66	9	S603[3] / Feasible
Via de la Valle to Lomas Santa Fe Drive – NB															
R6.12A	801 America Way	70	73	75 A/E	75^{T}	0	73	2	71	4	**69**^{R}	**6**	67	8	S602 / Feasible
R6.12#	818 America Way	65	68	69 A/E	67^{T}	2	66	3	65	4	**64**^{R}	**5**	63	6	S602 / Feasible
R6.12B	1013 America Way	65	68	69 A/E	68	1	67	2	66	3	65	4	65	4	Not Feasible
R6.13	847 America Way	68	71	73 A/E	70^{T}	3	69	4	**67**^{R}	**6**	66	7	65	8	S602 / Feasible
R6.13A	1003 Reliance Way	64	67	68 A/E	67	1	66	2	66	2	65	3	65	3	Not Feasible
R6.14	1015 Freedom Court	67	70	72 A/E	68^{T}	4	67	5	**66**^{R}	**6**	65	7	65	7	S602 / Feasible
R6.14A	817 America Way	61	64	65 N	64	1	64	1	64	1	63	2	63	2	--
R6.15	803 Spindrift Drive	68	71	72 A/E	70	2	69	3	69	3	68	4	68	4	Not Feasible
R6.16	1005 Highland Drive	69	71	72 A/E	70	2	69	3	68^{T}	4	6	4	**67**^{R}	5	S602 / Feasible
R6.16A	1005 Highland Drive	69	71	72 A/E	70	2	69	3	68^{T}	4	6	4	**67**^{R}	5	S602 / Feasible
R6.17A	695 Marine View Avenue	72	71	72 A/E	69	3	68	4	67^{T}	5	66	6	**65**^{R}	**7**	S602 / Feasible
R6.17	683 Marine View Avenue	71	73	75 A/E	70	5	69^{T}	6	68	7	67	8	**67**^{R}	**8**	S602 / Feasible
R6.18	677 Marine View Avenue	69	71	73 A/E	70	3	70	3	69	4	68	5	**68**^{R,T}	**5**	S602 / Feasible
R6.19	641 Marine View Avenue	70	72	75 A/E	73	2	73	2	72	3	71	4	**70**^{R,T}	**5**	S602 / Feasible
R6.20	959 Genevieve Street	73	75	75 A/E	74	1	73	2	72	3	70	5	**68**^{R}	**7**	S602 / Feasible

Table 3.15.13 (cont.): Predicted Future Noise Levels and Soundwall Feasibility for Segment 6

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Location Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Via de la Valle to Lomas Santa Fe Drive – NB(cont.)															
R6.21	621 Marine View Avenue	66	70	72 A/E	70	2	69	3	68	4	67	5	**66 R,T**	**6**	S602 / Feasible
R6.22 W	1010 Solano Drive - Santa Fe Montessori	69	73	74 A/E	73	1	72	2	72	2	71	3	70	4	Not Feasible
R6.23 W	1010 Solano Drive - Santa Fe Montessori	61	65	67 A/E	65	2	65	2	64	3	64	3	64	3	Not Feasible
R6.24 W	200 Marine View Avenue	66	68	70 A/E	--	--	--	--	--	--	--	--	--	--	Not Feasible
R6.25 W	200 Marine View Avenue	63	65	66 A/E	--	--	--	--	--	--	66	0	66	0	Not Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[3] – Following receipt of public comments on the Draft EIR/EIS, this soundwall was redesigned to recommend breaking the wall into two parts with a gap in the center to maintain the potential coastal view. The southern portion of this segmented soundwall (S603A) would extend from milepost 597+80 to milepost 601+00. The northern portion of this soundwall (S603B) would extend from milepost 604+80 to milepost 608+15. This segmented soundwall would attenuate project noise levels by 5 to 7 dBA with a height ranging from 8 to 12 feet.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
N – No noise impact.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – The existing and future noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.13: Predicted Future Noise Levels and Soundwall Feasibility for Segment 6 (Option 2)

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Via de la Valle to Lomas Santa Fe Drive – SB															
R6.9	865 Mola Vista Way	69	74	74 A/E	74	0	74	0	74	0	73 T	1	70	4	Not Feasible
R6.9A	865 Mola Vista Way	67	73	73 A/E	71	2	69	4	69	4	**68 R,T**	**5**	68	5	S603 (Option 2) / Feasible
Via de la Valle to Lomas Santa Fe Drive – NB															
R6.17A	695 Marine View Avenue	72	71	72 A/E	69	3	68	4	**67 R,T**	**5**	66	6	65	7	S602 (Option 2) / Feasible
R6.17	683 Marine View Avenue	71	72	75 A/E	70	5	69 T	6	**68 R**	**7**	67	8	67	8	S602 (Option 2) / Feasible
R6.18	677 Marine View Avenue	69	71	73 A/E	70	3	70	3	69	4	68	5	**68 R,T**	**5**	S602 (Option 2) / Feasible
R6.19	641 Marine View Avenue	70	72	75 A/E	73	2	73	2	72	3	71	4	**70 R,T**	**5**	S602 (Option 2) / Feasible
R6.20	959 Genevieve Street	73	75	75 A/E	75 T	0	74	1	71	4	69	6	**68 R,4**	**7**	S602 (Option 2) / Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – The existing and future noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.14: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 6

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S602 Option 1	R6.12A, R6.12 – R6.21	20 MFR, 10 SFR	Shoulder and R/W / NB	12 ft to 16 ft / 2877 ft	$2,827,296	$1,260,000	Not Reasonable	Not Recommended
S603 Option 1	R6.4A, R6.4 – R6.11	20 MFR, 14 SFR, 2 SCH (10 Frontage Units)	Shoulder and R/W / SB	8 ft to 12 ft / 3439 ft	$1,717,564	$2,024,000	Reasonable	Not Recommended
S603A, S603B Option 1A	R6.4A, R6.4, R6.5, R6.9A, R6.10, and R6.11	16 MFR, 1 SFR, 1 SCH	Shoulder and R/W / SB	8 ft to 12 ft / 610 ft (S603A) 10 ft / 1109 ft (S603B)	$998,421 (S603A) $656,404 (S603B)	$598,000 (S603A) $440,000 (S603B)	Not Reasonable	Recommended for SI[3]
S602 Option 2	R6.17A, R6.17 – R6.20	6 SFR	Shoulder and R/W / NB	12 ft to 16 ft / 1509 ft	$1,286,701	$252,000	Not Reasonable	Recommended for SI[3]
S603 Option 2	R6.9 and R6.9A	3 MFR	Private Property / SB	14 ft to 16 ft / 394 ft	$492,094	$114,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way

SEGMENT 7 – Lomas Santa Fe Drive to Manchester Avenue

Areas with Noise Abatement

Table 3.15.15 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.16* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 7 are shown in *Figures 2-2.3, Sheets 23* through *26*. The following paragraphs describe the preliminary abatement decisions for Segment 7.

Soundwall S614: Soundwall S614 would be located in the right-of-way, along the northbound side of I-5, north of Lomas Santa Fe Drive. The wall would provide a feasible reduction in highway traffic noise for four single-family residences, represented by Receptor R7.14 (*Table 3.15.15*). Currently, there is an existing 12-ft-high soundwall in front of the residences represented by Receptors R7.12 and R7.13, but this soundwall would be demolished and rebuilt to make room for the new northbound access ramp alignment for Lomas Santa Fe Drive. Soundwall S614 would be coupled to the rebuilt project wall by a 10-ft-high connecting wall. Soundwall S614 would be reasonable to construct since the estimated cost would be less than the reasonable cost allowance. Therefore, construction of Soundwall S614 would be recommended (*Table 3.15.16*).

Soundwall S622 (Option 1): Soundwall S622 would be located in the right of-way, along the northbound side of I-5, south of Manchester Avenue. The wall would provide a feasible reduction in highway traffic noise for 32 single-family residences, represented by Receptors R7.18 and R7.20 to R7.32 (*Table 3.15.15*). Four residences, represented by Receptors R7.19 and R7.21A, would be enclosed by this wall but would not benefit from a noise reduction due to elevation differences between the right-of-way and these residences. Soundwall S622 would not be reasonable to construct due to the estimated construction cost being higher than the reasonable cost allowance (*Table 3.15.16*). Therefore, construction of Soundwall S622 (Option 1) would not be recommended. However, nine residences represented by Receptors R7.23 through R7.26 are predicted to be severely impacted by the future noise levels, equal or higher than 75 dBA, under the proposed build alternatives (*Table 3.15.15*). A second iteration of S622 has been proposed as S622 (Option 2), and is described below.

Soundwall S622 (Option 2): Soundwall S622 Option 2 would be a shorter wall located along the northbound side of I-5, south of Manchester Avenue. The wall would provide a feasible reduction in highway traffic noise for the nine severely impacted single-family residences represented by Receptors R7.23 to R7.26 (*Table 3.15.15*). Construction of Soundwall S622 would not be reasonable due to the estimated construction cost being higher than the total cost allowance (*Table 3.15.16*). However, S622 Option 2 would be recommended to abate for the severely impacted Receptors R7.23 through R7.26 (*Table 3.15.15*).

Areas without Noise Abatement

Receptors R7.1 to R7.6: The multi-family residences represented by Receptors R7.1 and R7.2 and the single-family residences that are represented by Receptors R7.3 to R7.6 are located on the southbound side of I-5, north of Lomas Santa Fe Drive. It would not be practical to abate for highway traffic noise for these residences due to the topography of the area (*Table 3.15.15*). These residences have tiered lots, and the elevation at the residential outdoor use area is much

higher than the elevation of the highway and right-of-way, making the construction of a soundwall within the right-of-way not feasible (*Table 3.15.15*). Also, installing a soundwall on private property would not be feasible in this area, because the local street alignments prevent the construction of a continuous soundwall that would be required to effectively abate noise in this location.

Receptors R7.7 to R7.11: These receptors represent single-family residences located on the southbound side of I-5, north of Lomas Santa Fe Drive. Only Receptor R7.7 would be impacted, and due to elevation differences between the residential outdoor use area and the highway, there would be no feasible area within the right-of-way to place a soundwall (*Table 3.15.15*). Additionally, a soundwall could not be placed on private property for these residences because the lots have large backyard decks that would hinder the placement of a soundwall.

Receptors R7.15 and R7.16: The single-family residences represented by Receptors R7.15 and R7.16 are located on the northbound side of I-5, north of Lomas Santa Fe Drive. The residence, represented by Receptor R7.16, is in an enclosed depressed area and is not impacted by highway noise (*Table 3.15.15*). It would not be feasible to abate for highway traffic noise for the residence represented by Receptor R7.15 due to elevation differences between the residence and the highway (*Table 3.15.15*).

Receptor R7.17: The single-family residence represented by Receptor R7.17 is located on the northbound side of I-5, north of Lomas Santa Fe Drive. It would not be feasible to abate for highway traffic noise at this residence due to the elevation differences between the residential outdoor use area and the highway, making the construction of a soundwall within the right-of-way not feasible (*Table 3.15.15*). A soundwall on private property was not considered because it would be a stand-alone soundwall for only one house.

Table 3.15.15: Predicted Future Noise Levels and Soundwall Feasibility for Segment 7

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Lomas Santa Fe Drive to Manchester Avenue – SB															
R7.1	305 Solana Hills Drive	68	69	71 A/E	71	0	71	0	70	1	70	1	70	1	Not Feasible
R7.2	305 Solana Hills Drive	71	71	74 A/E	73	1	72	2	71	3	70	4	70	4	Not Feasible
R7.3	691 Dell Street	70	71	73 A/E	73	0	73	0	72	1	71	2	71	2	Not Feasible
R7.4*	673 Solana Glen Court	67	68	70 A/E	70	0	69	1	68	2	68	2	67	3	Not Feasible
R7.5	679 Solana Glen Court	69	70	72 A/E	72	0	71	1	70	2	70	2	69	3	Not Feasible
R7.6	667 Solana Hills Court	67	68	70 A/E	70	0	70	0	70	0	69	1	68	2	Not Feasible
R7.7	602 Ridgeline Place	63	64	66 A/E	66	0	66	0	66	0	66	0	66	0	Not Feasible
R7.8	616 Ridgeline Place	60	61	64 N	--	--	--	--	--	--	--	--	--	--	--
R7.9	624 Ridgeline Place	61	62	64 N	--	--	--	--	--	--	--	--	--	--	--
R7.10	674 Canyon Drive	61	62	64 N	--	--	--	--	--	--	--	--	--	--	--
R7.11	656 Canyon Drive	62	63	65 N	--	--	--	--	--	--	--	--	--	--	--
Lomas Santa Fe Drive to Manchester Avenue – NB															
R7.12[W]	307 Santa Helena Drive	68	67	70 A/E	--	--	--	--	--	--	69	1	67	3	Not Feasible
R7.13[W]	325 Santa Helena Drive	65	66	68 A/E	--	--	--	--	--	--	67	1	66	2	Not Feasible
R7.14	807 Santa Regina	71	72	74 A/E	**68[R]**	**6**	67	7	66	8	65	9	65	9	S614 / Feasible
R7.15	807 Santa Regina	63	64	66 A/E	64	2	64	2	64	2	63	3	63	3	Not Feasible
R7.16	801 Santa Regina	61	62	64 N	63	1	63	1	62	2	62	2	62	2	Not Feasible
R7.17	837 Santa Rosita	62	63	66 A/E	64	2	64	2	63	3	63	3	62	4	Not Feasible
R7.18	831 Santa Rosita	65	66	68 A/E	66	2	64	4	**62[R]**	**6**	61	7	60	8	S622 / Feasible
R7.19	819 Santa Rosita	64	64	66 A/E	64	2	64	2	63	3	62	4	62	4	Not Feasible
R7.20	803 Santa Rosita	63	63	66 A/E	62[T]	4	62	4	**61[R]**	**5**	61	5	61	5	S622 / Feasible
R7.21	757 Santa Rosita	72	70	72 A/E	69[I]	3	67	5	**65[R,4]**	**7**	64	8	62	10	S622 / Feasible
R7.21A	745 Santa Rosita	63	63	66 A/E	64	2	63	3	63	3	62	4	62	4	Not Feasible
R7.22	833 Santa Florencia	72	72	74 A/E	72[I]	2	70	4	**69[R]**	**5**	68	6	67	7	S622 / Feasible
R7.23	825 Santa Florencia	73	73	76 A/E	74	2	73	3	72[T]	4	**71[R]**	**5**	69	7	S622 / Feasible
R7.24	809 Santa Florencia	74	74	76 A/E	74	2	73	3	**71[R,T]**	5	70	6	69	7	S622 / Feasible
R7.25	783 Santa Florencia	75	75	77 A/E	74	3	73	4	**72[R,T]**	5	71	6	70	7	S622 / Feasible
R7.26	771 Santa Florencia	74	74	76 A/E	72[I]	4	70	6	**69[R]**	7	68	8	67	9	S622 / Feasible
R7.27	755 Santa Florencia	67	67	70 A/E	66	4	66[T]	4	**65[R]**	5	64	6	64	6	S622 / Feasible
R7.28	733 Santa Florencia	68	68	70 A/E	66[I]	4	65	5	**64[R]**	6	64	6	64	6	S622 / Feasible
R7.29	717 Santa Florencia	68	68	68 A/E	64[T]	4	64	4	63	5	**63[R]**	**5**	63	5	S622 / Feasible
R7.30	810 Santa Inez	67	67	67 A/E	64[I]	3	63	4	63	4	**62[R]**	**5**	62	5	S622 / Feasible
R7.31	828 Santa Inez	68	68	70 A/E	65[T]	5	64	6	63	7	**63[R]**	**7**	62	8	S622 / Feasible
R7.32*	825 Santa Inez	68	67	68 A/E	64[I]	4	63	5	62	6	**62[R]**	**6**	60	8	S622 / Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[N] – No noise impact.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – The existing and future no build noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.15: Predicted Future Noise Levels and Soundwall Feasibility for Segment 7 (Option 2)

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Lomas Santa Fe Drive to Manchester Avenue – NB															
R7.23	825 Santa Florencia	73	73	76 A/ E	74	2	73	3	72T	4	**71R**	**5**	69	7	S622 (Option 2) / Feasible
R7.24	809 Santa Florencia	74	74	76 A/E	74	2	73	3	**71R,T**	**5**	70	6	69	7	S622 (Option 2) / Feasible
R7.25	783 Santa Florencia	75	75	77 A/E	74	3	73	4	**72R,T**	**5**	71	6	70	7	S622 (Option 2) / Feasible
R7.26	771 Santa Florencia	74	74	76 A/E	72T	4	72T	6	**69R**	**7**	68	8	67	9	S622 (Option 2) / Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – The existing and future no build noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.16: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 7

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S614	R7.14	4SFR	R/W / NB	8 ft to 10 ft / 499 ft	$110,718	$200,000	Reasonable	Recommended
S622 Option 1	R7.18, R7.20 – R7.32	32 SFR	R/W, Shoulder, and Private Property / NB	10 ft to 14 ft / 3648 ft	$2,261,800	$1,600,000	Not Reasonable	Not Recommended
S622 Option 2	R7.23 – R7.26	9SFR	R/W / NB	12 ft to 14 ft / 896 ft	$706,752	$450,000	Not Reasonable	Recommended for SI[3]

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way

SEGMENT 8 – Manchester Avenue to Birmingham Drive

Areas with Noise Abatement

Table 3.15.17 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.18* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 8 are shown in *Figures 2-2.3, Sheets 26* through *30*. The following paragraphs describe the preliminary abatement decisions for Segment 8.

Soundwalls S631: Soundwall S631 would be located along the southbound side of I-5 on private property, north of Manchester Avenue. The soundwall would provide a feasible reduction in highway traffic noise for 22 multi-family residences represented by Receptors R8.1, R8.2, and R8.4A (*Table 3.15.17*). The estimated construction cost of S631, including all easement costs, would be less than the reasonable cost allowance and so would be considered reasonable (*Table 3.15.18*). Soundwall S631 would be recommended in conjunction with Soundwalls S633 and S635 in order to adequately attenuate traffic noise (*Table 3.15.18*).

Soundwall S633: Soundwall S633 would be located on private property and in Caltrans right-of-way, along the southbound side of I-5, north of Manchester Avenue. The soundwall would provide a feasible reduction in highway traffic noise for 20 multi-family residences represented by Receptors R8.4 and R8.5, as well as one single-family residence represented by R8.3 (*Table 3.15.17*). The estimated construction cost of S633, including all easement costs, would be less than the reasonable cost allowance and so would be considered reasonable (*Table 3.15.18*). Soundwall S633 would be recommended in conjunction with Soundwalls S631 and S635 in order to adequately attenuate traffic noise (*Table 3.15.18*).

Soundwall S635: Soundwall S635 would be located along the shoulder of southbound I-5, just north of Manchester Avenue. The wall would provide a feasible reduction in highway traffic noise for eight multi-family residences represented by Receptor R8.6 (*Table 3.15.17).* Soundwall S635 would provide less than 5 dB noise reduction for R8.7; however, the wall would bring the future noise level below the NAC (*Table 3.15.17*). The estimated construction cost of S635, including all easement costs, would be less that the reasonable cost allowance and so would be considered reasonable (*Table 3.15.18*). Soundwall S635 would be recommended in conjunction with Soundwall S633 in order to adequately attenuate traffic noise (*Table 3.15.18*).

Soundwall S640: Soundwall S640 would be located on private property along the northbound side of I-5, north of Manchester Avenue. The wall would provide a feasible reduction in highway traffic noise for two single-family residences represented by Receptor R8.18 (*Table 3.15.17*). Soundwall S640 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.18*). Therefore, Soundwall S640 would not be recommended (*Table 3.15.18*).

Soundwall S647: Soundwall S647 would be located on the shoulder of southbound I-5, south of Birmingham Drive. The wall would provide a feasible reduction in highway traffic noise for outdoor use areas at five multi-family residences represented by Receptors R8.10A and R8.11 (*Table 3.15.17*). Soundwall S647 would not be reasonable to construct due to the estimated cost exceeding the reasonable cost allowance (*Table 3.15.18*). Therefore, Soundwall S647 would not be recommended (*Table 3.15.18*).

Soundwalls S644 and S646: Soundwalls S644 and S646 would be located on private property and Caltrans right-of-way along the northbound side of I-5, south of Birmingham Drive. The soundwalls would provide a feasible reduction in highway traffic noise for 12 single-family residences represented by Receptors R8.23 to R8.26 (*Table 3.15.17*). Future traffic noise at Receptors R8.23 to R8.26 is predicted to be severe (at or above 75 dBA) with the proposed build alternatives, and all but R8.25 and R8.26 would be severe with the No Build alternative (*Table 3.15.17*). Soundwalls S644 and S646 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.18*). Therefore, Soundwalls S644 and S646 would not be recommended as proposed (*Table 3.15.18*). With the proposed project, abatement would be required for the severely impacted residences. However, because of the poor soil quality in the location of the proposed soundwalls, construction may not be possible. Based on these constraints, the recommendation would be to extend the yards of the severely impacted residences and construct Soundwalls S644 and S646 on the new pads (*Table 3.15.18*).

Areas without Noise Abatement

Receptor R8.10: Receptor R8.10 represents a short-term measurement site taken at the Cardiff-by-the-Sea apartment complex located on the southbound side of I-5, south of Birmingham Drive. This site does not represent an area of frequent human use.

Receptor R8.12: Receptor R8.12 represents a group of single-family residences located on the southbound side of I-5, just south of Birmingham Drive. A soundwall located on the shoulder of the southbound Birmingham Drive on-ramp would not provide the required 5 dB noise reduction for these residences, and, therefore, would not be feasible (*Table 3.15.17*).

Receptor R8.13: A single-family residence represented by Receptor R8.13 is located on the northbound side of I-5, immediately east of the Manchester Avenue on-ramp. It would not be feasible to abate for highway traffic noise impacts due to the elevation differences between the right-of-way and the receptor (*Table 3.15.17*).

Receptors R8.14 to R8.17: Receptors R8.14 to R8.17 represent a group of single-family residences located on the northbound side of I-5 on a hill elevated approximately 148 ft above the highway. It would not be feasible to abate for highway traffic noise in this area due to constraints related to the topography of the area (*Table 3.15.17*). A soundwall could not be placed on private property for these residences because the lots are tiered and have large backyard decks that would hinder the placement of a soundwall.

Receptors R8.19 to R8.21: Receptors R8.19 to R8.21 are located on the northbound side of I-5 on a hill elevated approximately 98 ft above the highway. It would not be feasible to abate for highway traffic noise in this area due to constraints related to the topography of the area (*Table 3.15.17*). A soundwall could not be placed on private property for the residences represented by Receptors R8.19 to R8.21 because the lots are tiered and have large backyard decks that would hinder the placement of a soundwall.

Receptors R8.27 to R8.30: Receptors R8.27 to R8.30 are located on the northbound side of I-5. These receptors are elevated approximately 60 ft above the freeway. A soundwall within the State right-of-way would not be feasible because of elevation differences between the highway and the receptors (*Table 3.15.17*). Due to the topography of this area, it would also not be feasible to construct a soundwall located at the property line of Receptors R8.28 and R8.29 (*Table 3.15.17*).

Table 3.15.17: Predicted Future Noise Levels and Soundwall Feasibility for Segment 8

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Manchester Avenue to Birmingham Drive - SB															
R8.1	2559 Manchester Avenue	62 N	65	68	63	5	**62**R,T	**6**	61	7	60	8	59	9	S631 / Feasible
R8.2	2527 Ocean Cove Drive	65 N	68	70	69	1	67I	3	**65**R	**5**	63	7	62	8	S631 / Feasible
R8.4A	2380 Newport Avenue	68 A/E	71	73	71	2	70	3	**68**R,T	**5**	67	6	66	7	S631 / Feasible
R8.3*	2483 Caminito Ocean Cove	69 A/E	72	74	73	1	72I	2	**69**R	**5**	67	7	66	8	S633 / Feasible
R8.4	2495 Caminito Ocean Cove	71 A/E	74	76	73	3	71	5	**69**R,T	**7**	68	8	66	10	S633 / Feasible
R8.5	2463 Caminito Ocean Cove	72 A/E	75	78	73	5	71I	7	**70**R,	**8**	69	9	68	10	S633 / Feasible
R8.6	2449 Caminito Ocean Cove	71 A/E	74	77	75	2	74	3	73T	4	**72**R	**5**	70	7	S635 / Feasible
R8.7*	2433 Caminito Ocean Cove	57 N	69	68	67	1	67	1	66I	2	65	3	64	4	Not Feasible
R8.8	Cardiff-by-the-Sea Apartment Complex – south building	57 N	60	62	61	1	61	1	61	1	61	1	60	2	Not Feasible
R8.9	Cardiff-by-the-Sea Apartment Complex – tennis court	58 N	61	63	62	1	62	1	62	1	61	2	61	2	Not Feasible
R8.10M	Cardiff-by-the-Sea Apartment Complex	70 A/E	72	73	70	3	69	4	67	6	66	7	65	8	--
R8.10A	Cardiff-by-the-Sea Apartment Complex	69 A/E	72	74	71	3	69	5	68	6	**68**R,	**6**	66	8	S647 / Feasible
R8.11	Cardiff-by-the-Sea Apartment Complex – north building	66 A/E	69	70	67	3	67	3	66	4	**65**R	**5**	64	6	S647 / Feasible
R8.12	2061 MacKinnon Avenue	63 N	66	68	68	0	68	0	68	0	67	1	67	1	Not Feasible
Manchester Avenue to Birmingham Drive – NB															
R8.13	3107 Manchester Avenue	65 N	68	70	--	--	--	--	--	--	--	--	--	--	--
R8.14	2379 Lagoon View Drive	62 N	65	67	--	--	--	--	--	--	--	--	--	--	--
R8.15	1139 Lagoon View Court	63 N	66	68	--	--	--	--	--	--	--	--	--	--	--
R8.16	1115 Lagoon View Court	64 N	67	69	--	--	--	--	--	--	--	--	--	--	--
R8.17	1101 Lagoon View Court	63 N	66	68	--	--	--	--	--	--	--	--	--	--	--
R8.18	2148 Bulrush Lane	71 A/E	71	73	71I	2	70	3	69	4	**68**R	**5**	66	7	S640 / Feasible
R8.19	2136 Bulrush Lane	75 A/E	71	73	72	1	72	1	71	2	71	2	70	3	Not Feasible
R8.20	2050 Bulrush Lane	71 A/E	71	74	--	--	--	--	--	--	--	--	--	--	--
R8.21	2010 Bulrush Lane	71 A/E	69	71	--	--	--	--	--	--	--	--	--	--	--
R8.22	1945 Playa Riviera Drive	71 A/E	69	71	71	0	71	0	71	0	71	0	71	0	Not Feasible
R8.23	1944 Playa Riviera Drive	79 A/E	76	79	77	2	75T	4	**72**R	**7**	70	9	68	11	S644 / Feasible
R8.24	1932 Playa Riviera Drive	78 A/E	76	78	78	0	78	0	76	2	75	3	**73**R,T	**5**	S644 / Feasible
R8.25	1914 Playa Riviera Drive	77 A/E	74	77	71T	6	69R	8	67	10	66	11	65	12	S646 / Feasible
R8.26	1884 Playa Riviera Drive	76 A/E	74	76	74I	2	71R	5	68	8	66	10	65	11	S646 / Feasible
R8.27	1860 Playa Riviera Drive	73 A/E	72	74	--	--	--	--	--	--	--	--	--	--	--
R8.28	1830 Playa Riviera Drive	71 A/E	70	72	--	--	--	--	--	--	--	--	--	--	--
R8.29	915 Emma Drive	71 A/E	70	72	--	--	--	--	--	--	--	--	--	--	--
R8.30	906 Emma Drive	67 A/E	65	67	--	--	--	--	--	--	--	--	--	--	--

1 – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
2 – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
N – No noise impact.
M – Receptor is not an area of frequent human use. Receptor represents a measurement site.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
W – The existing and future no build noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.18: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 8

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S631	R8.1, R8.2, and R8.4A	22 MFR	Private Property / SB	10 ft to 12 ft / 758 ft	$807,239	$1,056,000	Reasonable	Recommended
S633	R8.3, R8.4, and R8.5	1 SFR and 20 MFR	R/W / SB	12 ft / 837ft	$771,426	$1,092,000	Reasonable	Recommended
S635	R8.6	8 MFR	Shoulder / SB	14 ft / 322 ft	$346,323	$400,000	Reasonable	Recommended
S640	R8.18	2 SFR	R/W / NB	14 ft / 420 ft	$463,147	$92,000	Not Reasonable	Not Recommended
S647	R8.10A and R8.11	5 MFR	Shoulder / SB	14 ft / 696 ft	$293,478	$200,000	Not Reasonable	Not Recommended
S644 and S646	R8.23 – R8.26	12 SFR	R/W and Private Property / NB	10 ft to 16 ft / 899 ft and 10 ft / 899 ft	$990,771	$624,000	Not Reasonable	Recommended for SI[3]

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence.
[2] – Estimated construction cost includes cost of easements.
[3] – Recommended to extend backyards & construct for SI receptors
R/W – right-of-way

SEGMENT 9 – Birmingham Drive to Santa Fe Drive

Areas with Noise Abatement

Table 3.15.19 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.20* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 9 are shown in *Figures 2-2.3, Sheets 30* through *32*. The following paragraphs describe the preliminary abatement decisions for Segment 9.

Soundwall S652: Soundwall S652 would be located along the property line on the northbound side of I-5, north of Birmingham Drive. The soundwall would provide feasible reduction in highway traffic noise for six single-family residences, represented by Receptors R9.11 and R9.12, of which R9.12 would be severely impacted by the build alternatives (*Table 3.15.19*). Cost of acquisition for right-of-way is assumed to be $115,807 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If the estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S652 would not be recommended *(Table 3.15.20*) and individual abatement would be provided only for the severely impacted receptor, R9.12.

Soundwall S653: Soundwall S653 would be located on the right-of-way on the southbound side of I-5, north of Birmingham Drive. The soundwall would provide feasible reduction in highway traffic noise for four single-family residences represented by Receptors R9.3 and R9.4, but not for 9.4A. Receptor R9.4 would be severely impacted by build alternatives, with noise levels predicted to be at or higher than 75 dBA (*Table 3.15.19*). Soundwall S653 would not be reasonable to construct due to the estimated construction cost exceeding the total reasonable allowance *(Table 3.15.20)*. Therefore Soundwall S653 would not be recommended as proposed *(Table 3.15.20*). Individual abatement would be provided only for the severely impacted receptor, R9.4.

Soundwall S654 (Option 1): Soundwall S654 Option 1 would be located along the right-of-way on the northbound side of I-5, north of Birmingham Drive. It would provide a feasible reduction in highway traffic noise for nine single-family residences represented by Receptors R9.13 to R9.15, but not R9.15A. Receptor R9.13 would be severely impacted by the build alternatives, with noise levels predicted to be at or higher than 75 dBA *(Table 3.15.19)*. Construction of Soundwall S654 Option 1 would not be reasonable to construct due to the estimated construction cost exceeding the total reasonable allowance (*Table 3.15.20*). Therefore, Soundwall S654 would not be recommended as proposed *(Table 3.15.20*). To abate for the severely impacted receptor represented by R9.13, Option 2 would be considered.

Soundwall S654 (Option 2): Soundwall S654 Option 2 would be a shorter wall that would wrap around the private property line, providing a feasible reduction in highway traffic noise for the severely impacted residential unit represented by Receptor R9.13. Option 2 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance *(Table 3.15.20*). However, it would be recommended that S654 Option 2 be constructed to abate severe highway traffic noise for Receptor R9.13 *(Table 3.15.20*).

Soundwall S658: Soundwall S658 would be located along the right-of-way and the shoulder of northbound I-5, south of Santa Fe Drive. The wall would provide feasible reduction in highway traffic noise for 20 single-family residences represented by Receptors R9.17 through R9.22, of which Receptors R9.17, R9.18, and R9.21 would be severely impacted by the proposed build alternatives *(Table 3.15.19*). Construction of Soundwall S658 would not be reasonable due to the estimated construction cost exceeding the total reasonable allowance (*Table 3.15.20*). However, to abate for the severely impacted receptors, Soundwall S658 would be recommended (*Table 3.15.20).*

Areas without Noise Abatement

Receptors R9.1 and R9.2: These receptors are located on the southbound side of I-5, just north of Birmingham Drive. A soundwall would not provide the required 5 dB noise reduction for these receptors; therefore, it would not be feasible (*Table 3.15.19*). It also would not be feasible to build a soundwall on the property of these receptors due to the sloped and tiered backyards of these residences (*Table 3.15.19*).

Receptor R9.10: Receptor R9.10 represents the pool area at the Country Inn Hotel on the northbound side of I-5. A soundwall located on the shoulder of the northbound Birmingham Drive on-ramp would not provide the required 5 dB noise reduction, and, therefore, would not be feasible (*Table 3.15.19*).

Table 3.15.19: Predicted Future Noise Levels and Soundwall Feasibility for Segment 9

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No./ Feasibility
			Future "No Build"	Project without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Birmingham Drive to Santa Fe Drive – SB															
R9.1	1855 MacKinnon Avenue	63	67	69 A/E	68	1	68	1	68	1	67	2	67	2	Not Feasible
R9.2	1815 MacKinnon Avenue	64	69	71 A/E	71	0	70	1	70	1	70	1	69	2	Not Feasible
R9.3	1725 MacKinnon Avenue	67	72	74 A/E	71 T	3	**69 R**	**5**	68	6	67	7	67	7	S653 / Feasible
R9.4	1633 MacKinnon Avenue	70	75	77 A/E	70 T	7	**68 R**	**9**	66	11	65	12	65	12	S653 / Feasible
R9.4A	1606 MacKinnon Avenue	60	65	68 A/E	66	2	65	3	65	3	65	3	64	4	Not Feasible
Birmingham Drive to Santa Fe Drive – NB															
R9.10	1661 Villa Cardiff Drive	67	68	69 A/E	69	0	68	1	68	1	67	2	67	2	Not Feasible
R9.11	1630 Falcon Hill Court	70	71	74 A/E	**67 R,T**	**7**	64	10	62	12	62	12	61	13	S652 / Feasible
R9.12	811 Nolbey Street	71	72	75 A/E	**69 R,T**	**6**	66	9	63	12	61	14	61	14	S652 / Feasible
R9.13	804 Nolbey Street	70	71	75 A/E	72 T	3	71	4	**70 R**	**5**	68	7	67	8	S654 / Feasible
R9.14 B,K	1551 Villa Cardiff Drive	57	60	67 A/E	65 T	2	64	3	63	4	**62 R**	**5**	62	5	S654 / Feasible
R9.15 B	1511 Villa Cardiff Drive	64	67	73 A/E	70 T	3	69	4	69	4	68	5	**68 R**	**5**	S654 / Feasible
R9.15A K	1511 Villa Cardiff Drive	58	61	66 A/E	64 T	2	63	3	63	3	62	4	62	4	Not Feasible
R9.16 K	1451 MacKinnon Avenue	60	63	65 N	64 T	1	63	2	63	2	62	3	62	3	--
R9.17	1470 MacKinnon Avenue	73	76	79 A/E	**74 R,T**	**5**	72	7	70	9	69	10	68	11	S658 / Feasible
R9.18	609 Ocean Crest Road	72	72	75 A/E	71	4	**70 R,T**	**5**	68	7	66	9	66	9	S658 / Feasible
R9.19	1360 Loch Lomond Drive	71	71	74 A/E	69 T	5	**68 R**	**6**	67	7	66	8	65	9	S658 / Feasible
R9.20	1266 Loch Lomond Drive	67	69	71 A/E	67 T	4	**66 R**	**5**	65	6	64	7	64	7	S658 / Feasible
R9.21	553 Faith Avenue	71	73	76 A/E	74	2	73	3	**71 R,T**	**5**	69	7	67	9	S658 / Feasible
R9.22	546 Faith Avenue	70	72	74 A/E	73	1	71 T	3	**69 R**	**5**	67	7	66	8	S658 / Feasible

1 – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
2 – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
N – No noise impact.
B – The existing and future "No Build" levels at Receptors R9.14 and R9.15 include the benefits of an existing berm that would be removed under the project "build" alternatives.
K – A shielding factor of 5 dB has been applied to Receptor R9.14 and R9.15A to account for attenuation provided by first-row buildings.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
* – Non first-row receiver.

Table 3.15.20: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 9

Soundwall No	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S653	R9.3 and R9.4	4 SFR	R/W / SB	10 ft / 709 ft	$638,653	$216,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]
S652	R9.11 and R9.12	6 SFR	Property Line / NB	8 ft / 407 ft	$339,956	$252,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]
S654 Option 1	R9.13 to R9.15	9 SFR	R/W / NB	12 ft to 16 ft / 1073 ft	$849,352	$360,000	Not Reasonable	Not Recommended
S654 Option 2	R9.13	1 SFR	Private Property / NB	10 ft / 187 ft	$177,100	$42,000	Not Reasonable	Recommended for SI[3]
S658	R9.17 to R9.22	20 SFR	R/W and Shoulder / NB	8 ft to 12 ft / 2136 ft	$1,382,331	$1,040,000	Not Reasonable	Recommended for SI[3]

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way

SEGMENT 10 – Santa Fe Drive to Encinitas Boulevard

Areas with Noise Abatement

Table 3.15.21 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.22* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 10 are shown in *Figures 2-2.3, Sheets 32* through *34.* The following paragraphs describe the preliminary abatement decisions for Segment 10.

Soundwall S664: Soundwall S664 would be located along the northbound side of I-5, just north of Santa Fe Drive. It would provide a feasible reduction in highway traffic noise for three single-family and eight multi-family residences represented by Receptors R10.11 and R10.12; and the Seacoast Community Church/School playground represented by Receptor R10.13 (*Table 3.15.21*). Receptors R10.11 and R10.13 are predicted to be severely impacted by future noise levels, equal or higher than 75 dBA, under the proposed build alternatives (*Table 3.15.21).* Soundwall S664 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.22).* Soundwall S664 would not be recommended (*Table 3.15.22*). However, the severely impacted receptors, R10.11 and R10.13, would receive individual abatement.

Soundwall S670: Soundwall S670 would be located along the shoulder of the northbound side of I-5, just south of Requeza Street. It would provide a feasible reduction in highway traffic noise for the outdoor use area of a nursing/rehab center and the playground area of a multi-family complex, represented by Receptors R10.14 and R10.15, respectively (*Table 3.15.21).* Soundwall S670 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.22*). Therefore, Soundwall S670 would not be recommended (*Table 3.15.22*).

Soundwall S671: Soundwall S671 would be located along the southbound side of I-5, just south of Requeza Street. The soundwall would provide a feasible reduction in highway traffic noise for 11 single-family residences represented by Receptors R10.3B, R10.3A, R10.4, and R10.4A (*Table 3.15.21*). Receptors R10.3A and R10.4 are predicted to be severely impacted by traffic noise at or higher than 75 dBA (*Table 3.15.21*). Soundwall S671 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.22*). Soundwall S671, however, would preliminarily be recommended in order to abate for the severely impacted receptors, R10.3A and R10.4.

Soundwall S675: Soundwall S675 would be located along the southbound side of I-5, just south of Encinitas Boulevard. The wall would provide a feasible reduction in highway traffic noise for 18 single-family residences, represented by Receptors R10.5 through R10.8, of which R10.6 would be severely impacted by traffic noise at or higher than 75 dBA under the build alternatives (*Table 3.15.21).* Soundwall S675 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.22*). Cost of acquisition for right-of-way is assumed to be $227,594 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If the estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S675 would not be recommended (*Table 3.15.22*) and individual abatement would be provided only for the severely impacted receptor, R10.6.

Areas without Noise Abatement

Receptors R10.1 and R10.2: These receptors are located on the southbound side of I-5 just south of Requeza Street. Soundwalls at two locations were modeled to abate traffic noise for receptors R10.1 and R10.2. A soundwall located at the shoulder of I-5 or along Devonshire Drive would not provide a 5 dB noise reduction for any of these receptors; therefore, it would not be feasible (*Table 3.15.21*).

Receptor R10.9: Receptor R10.9 represents a group of second-row single-family residences located on the southbound side of I-5. Due to elevation differences between these receptors and the highway, a soundwall would not be feasible (*Table 3.15.21).*

Receptor R10.10: Receptor R10.10 represents a group of third-row single-family residences located on the northbound side of I-5. A soundwall located at the right-of-way would not provide a 5 dB noise reduction for any of the receptors; therefore, it would not be feasible.

Receptors R10.16 and R10.17: Receptor 10.16 represents a group of second-row multi-family residences, and Receptor R10.17 represents a single-family residence located on the northbound side of I-5. A soundwall on the shoulder south of Requeza Street was analyzed and was found to provide less than 5 dB noise reduction to either receptor; therefore, it would not be feasible (*Table 3.15.21*). Also, it would not be possible to construct a soundwall at the right-of-way because of elevation differences between the freeway and the receptors.

Receptors R10.18, R10.19, and R10.19A: These receptors are located on the northbound side of I-5 just north of Requeza Street, and they represent a new single-family residential development. The new residential development has a block wall at the property line, a large landscaped area, and a transparent wall located at each backyard. Soundwalls would not be feasible for this area due to the two existing walls (*Table 3.15.21*).

Receptor R10.20: Receptor R10.20 represents a preschool located on the northbound side of I-5 just north of Requeza Street. There is a commercial property between the preschool and the freeway; therefore, locating a soundwall at the property line would not be considered practical. A soundwall located on the right-of-way was analyzed and found to provide a less than 5 dB noise reduction at these receptors; therefore, it would not be feasible *(Table 3.15.21).*

Table 3.15.21: Predicted Future Noise Levels and Soundwall Feasibility for Segment 10

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Santa Fe Drive to Encinitas Boulevard – SB															
R10.1	946 Devonshire Drive	65	67	70 A/E	70	0	70	0	69	1	68	2	67	3	Not Feasible
R10.2	870 Devonshire Drive	66	68	71 A/E	70	1	69	2	69	2	68	3	67	4	Not Feasible
R10.3[M]	826 Devonshire Drive	71	72	75 A/E	72[T]	3	71	4	69	6	68	7	66	9	S671 / Feasible
R10.3B[K]	826 Devonshire Drive	67	66	68 A/E	65[T]	3	65	3	63	5	**63[R]**	**5**	62	6	S671 / Feasible
R10.3A	768 Devonshire Drive	77	76	79 A/E	75	4	74	5	73	6	**72[R,T]**	**7**	71	8	S671 / Feasible
R10.4	720 Devonshire Drive	77	76	78 A/E	74	4	73	5	**72[R,T]**	**6**	71	7	70	8	S671 / Feasible
R10.4A	715 Devonshire Drive	72	71	74 A/E	70T	4	70	4	**69[R]**	**5**	68	6	68	6	S671 / Feasible
R10.5	655 Stratford Drive	72	72	74 A/E	**69[R,T]**	**5**	68	6	67	7	66	8	66	8	S675 / Feasible
R10.6	611 Stratford Drive	68	74	76 A/E	**70[R,T]**	**6**	68	8	67	9	66	10	64	12	S675 / Feasible
R10.7	212 East D Street	71	71	73 A/E	**68[R,T]**	**5**	66	7	65	8	64	9	63	10	S675 / Feasible
R10.8	428 Arden Drive	71	71	73 A/E	69[T]	4	**68[R]**	**5**	68	5	67	6	67	6	S675 / Feasible
R10.9*	401 Arden Drive	68	68	70 A/E	69	1	68	2	68	2	67	3	67	3	Not Feasible
Santa Fe Drive to Encinitas Boulevard – NB															
R10.10*	1143 Golden Road	71	69	71 A/E	71	0	71	0	71	0	70	1	70	1	Not Feasible
R10.11	1125 Regal Road	76	74	77 A/E	75	2	74[T]	3	72	5	**70[R]**	**7**	69	8	S664 / Feasible
R10.12[K]	1085 Regal Road	66	65	68 A/E	66	2	65	3	64[T]	4	**63[R]**	**5**	62	6	S664 / Feasible
R10.13	1050 Regal Road – Seacoast	76	75	77 A/E	74	3	73[T]	4	**72[R]**	**5**	71	6	69	8	S664 / Feasible
R10.14	944 Regal Road	69	70	73 A/E	71	2	71	2	69[T]	4	69	4	**68[R]**	**5**	S670 / Feasible
R10.15*	806-810 Regal Road – Regal Playground	70	71	74 A/E	71	3	70	4	69[T]	5	**69[R]**	**5**	67	7	S670 / Feasible
R10.16*	Regal Condos	66	67	70 A/E	69	1	69	1	68	2	67	3	66	4	Not Feasible
R10.17*	395 Requeza Street Water District	68	69	71 A/E	70	1	70	1	69	2	68	3	67	4	Not Feasible
R10.18[W]	648 Beach Street	67	68	71 A/E	70	1	70	1	69	2	69	2	69	2	Not Feasible
R10.19[W]	542 Beach Street	66	67	70 A/E	70	0	69	1	69	1	69	1	69	1	Not Feasible
RR10.19A[W]	526 Beach Street	66	67	69 A/E	69	0	69	0	69	0	68	1	68	1	Not Feasible
R10.20	333 Encinitas Boulevard	67	68	70 A/E	70	0	69	1	69	1	68	2	68	2	Not Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[K] – A shielding factor of 5 dB has been applied to Receptor 10.12 and to R10.3B to account for attenuation provided by first-row buildings.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[M] – This receptor represents a measurement site. It is not an area of frequent human use.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – Includes the benefits of an existing five-ft high block wall and six-ft high glass wall.
* – Non first-row receiver.

Table 3.15.22: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 10

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S671	R10.3B, R10.3A, R10.4, R10.4A	11 SFR	Private Property and R/W / SB	12 ft to 14 ft / 860 ft	$555,708	$462,000	Not Reasonable	Recommended for SI[3]
S675	R10.5 – R10 8	18 SFR	R/W / SB	8 ft to 10 ft / 1437 ft	$1,025,864	$972,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]
S664	R10.11 – R10.13	3 SFR, 8 MFR and SCH (3 Frontage Units)	R/W / NB	12 ft to 14 ft / 1263 ft	$1,171,232	$700,000	Not Reasonable	Not Recommended, Individual Abatement for SI[3]
S670	R10.14 and R10.15	2 REC (2 Frontage Units)	Shoulder / NB	14 ft to 16 ft / 1217 ft	$365,633	$96,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way

SEGMENT 11 – Encinitas Boulevard to Leucadia Boulevard

Areas with Noise Abatement

Table 3.15.23 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.24* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 11 are shown in *Figures 2-2.3, Sheets 34* through *37*. The following paragraphs describe the preliminary abatement decisions for Segment 11.

Soundwall S680: Soundwall S680 would be located on the right-of-way and private property along the northbound side of I-5, just north of Encinitas Boulevard. The soundwall would provide a feasible reduction in highway traffic noise for 30 multi-family residences represented by Receptors R11.22 and R11.23, and one recreational area at the Encinitas YMCA, represented by Receptors R11.24 and R11.25 (*Table 3.15.23*). Soundwall S680 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.24*). Cost of acquisition for right-of-way is assumed to be $636,703 for this wall, and when added to the construction cost, it exceeds the reasonable allowance. If the estimated construction cost could not be reduced to less than or equal to the reasonable allowance, construction of S680 would not be recommended.

Soundwall S686A: Soundwall S686A would be located on private property along the northbound side of I-5, north of Encinitas Boulevard. The soundwall would provide a feasible reduction in highway traffic noise for a park represented by Receptor R11.27 (*Table 3.15.23*). It is predicted that R11.27 would be severely impacted by the proposed build alternatives with noise levels at or above 75 dBA. Soundwall S686A would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.24*). However, S686A would be recommended in order to abate for the severely impacted receptor, R11.27.

Soundwalls S686B and S686C: Soundwalls S686B and S686C would be located on private property along the northbound side of I-5, north of Encinitas Boulevard. The soundwalls would provide a feasible reduction in highway traffic noise for sixteen single-family residences represented by Receptors R11.26 and R11.28 (*Table 3.15.23*). Soundwalls S686B and S686C would be reasonable to construct (*Table 3.15.24*). Therefore, Soundwalls S686B and S686C would be recommended (Table 3.15.24).

Soundwall S688: Soundwall S688 would be located along the northbound side of I-5, north of Encinitas Boulevard. The soundwall would provide a feasible reduction in highway traffic noise for one single-family residence represented by Receptor R11.29 (*Table 3.15.23*). Receptor R11.29 is predicted to be severely impacted by the proposed build alternatives with noise levels at or higher than 75 dBA (*Table 3.15.23*). Soundwall S688 would not be reasonable to construct due to the estimated construction cost would exceed the reasonable allowance (*Table 3.15.24*). However, S688 would be recommended to provide the required abatement for the severely impacted receptor, R11.29 (*Table 3.15.24*).

Soundwall S689: Soundwall S689 would be located along the southbound side of I-5, just south of Leucadia Boulevard. The soundwall would provide a feasible reduction in highway traffic noise for 26 single-family residences represented by Receptors R11.5A, R11.6, R11.7, R11.9, R11.11 through R11.14, R11.16 through R11.18, and R11.20 (*Table 3.15.23*). Residences that

would be enclosed by this wall, but would not benefit from a feasible noise reduction, are represented by Receptors R11.5, R11.8, R11.10, R11.15, and R11.19 *(Table 3.15.23*). Receptors R11.5A, R11.6, R11.7, R11.9, R11.11, R11.13, R11.14, R11.16, R11.17, and R11.18 are predicted to be severely impacted with noise levels at or higher than 75 dBA with the proposed build alternatives (*Table 3.15.23*). With the No Build alternative, Receptors R11.9, R11.11, R11.14, and R11.18 would still be severely impacted (*Table 3.15.23*). Soundwall S689 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.24*). Constructing S689 has the potential to create a high visual impact for motorists traveling on I-5 (refer to *Section 3.7* for details on visual impacts). In an effort to avoid potential visual impacts, individual abatement for the severely impacted residences would be proposed. However, if agreements with property owners could not be reached regarding individual abatement, then Soundwall S689 would be preliminarily recommended as proposed (*Table 3.15.24*).

Soundwall S692: Soundwall S692 would be located along the shoulder of northbound side of I-5, south of Leucadia Boulevard. The soundwall would provide a feasible reduction in highway traffic noise for Poinsettia Park represented by Receptors R11.31 and R11.31A, and for 10 single-family residences represented by Receptors R11.32 through R11.36 (*Table 3.15.23*). Receptors R11.31, R11.32, R11.34, and R11.35 are predicted to be severely impacted with noise levels at or higher than 75 dBA under the build alternatives (*Table 3.15.23*). Soundwall S692 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.24*). However, Soundwall S692 would be recommended to provide the required abatement for the severely impacted receptors (*Table 3.15.24*).

Areas without Noise Abatement

Receptors R11.1 through R11.4: These receptors are located on the southbound side of I-5, just north of Encinitas Boulevard. It would not be feasible to provide abatement for this area due to elevation differences between the shoulder and right-of-way, and the residences (*Table 3.15.23*). Extending Soundwall S689 to the south was modeled; however, the soundwall would still not provide the minimum required 5 dB noise reduction for Receptors R11.1 through R11.4, and, therefore, would not be feasible (*Table 3.15.23*). It also would not be practical to build a soundwall at the property line of these receivers due to the topography of the area. Each house is located at a different elevation and at a different distance to the freeway, which would not allow for construction of a continuous wall.

Receptor R11.30: Receptor R11.30 represents a group of second-row single-family residences located on the northbound side of I-5. A soundwall placed at the shoulder of the highway would not provide the required 5 dB noise reduction to these residences due to topography, and shielding provided by first-row buildings (*Table 3.15.23*). Therefore, it would not be feasible to construct (*Table 3.15.23*).

Table 3.15.23: Predicted Future Noise Levels and Soundwall Feasibility for Segment 11

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Encinitas Boulevard to Leucadia Boulevard – SB															
R11.1	469 Arroyo Drive	66	65	68 A/E	67	1	66	2	66	2	65	3	65	3	Not Feasible
R11.1A	333 Via Nancita	66	65	68 A/E	68	0	67	1	67	1	66	2	66	2	Not Feasible
R11.2	325 Via Nancita	66	65	67 A/E	67	0	67	0	67	0	67	0	66	1	Not Feasible
R11.3	309 Via Nancita	70	69	71 A/E	71	0	70	1	70	1	69	2	69	2	Not Feasible
R11.4	438 Ocean View Terrace	69	68	70 A/E	70	0	70	0	70	0	69	1	69	1	Not Feasible
R.11.5*	363 Ocean View Avenue	69	69	71 A/E	70	1	70	1	70	1	69	2	68	3	Not Feasible
R11.5A	365 1/2 Ocean View Avenue, 1/2	73	73	75 A/E	72	3	70	5	**70 R,T**	**5**	68	7	67	8	S689 / Feasible
R11.6	365 Ocean View Avenue	73	73	75 A/E	71	4	70	5	**69 R,T**	**6**	67	8	66	9	S689 / Feasible
R11.7	452 Alviso Way	74	74	75 A/E	71	4	70	5	**68 R,T**	**7**	67	8	66	9	S689 / Feasible
R11.8*	436 Alviso Way	71	71	73 A/E	72	1	72	1	71	2	71	2	70	3	Not Feasible
R11.9	453 Ocean View Avenue	75	75	78 A/E	75	3	74	4	73	5	**73 R,T**	**5**	71	7	S689 / Feasible
R11.10	455 Ocean View Avenue	69	69	72 A/E	71	1	71	1	70	2	70 T	2	69	3	Not Feasible
R11.11	457 Union Street	75	76	76 A/E	70 T	6	69	7	67	9	66	10	**66 R,T**	**10**	S689 / Feasible
R11.12*	420 Union Street	68	63	72 A/E	70	2	70	2	71 T	3	68	4	**67 R**	**5**	S689 / Feasible
R11.13	541 Guidero Way	71	72	75 A/E	73	2	72	3	73 T	4	69	6	**68 R**	**7**	S689 / Feasible
R11.14	569 Ocean View Avenue	74	75	78 A/E	75	3	74	4	72	5	71	7	**70 R**	**8**	S689 / Feasible
R11.15	537 Ocean View Avenue	71	71	74 A/E	73	1	73	1	72 T	2	72 T	2	71	3	Not Feasible
R11.16	611 Ocean View Avenue	73	73	76 A/E	74	2	73	3	72	4	70	6	**69 R**	**7**	S689 / Feasible
R11.17	675 Ocean View Avenue	72	72	75 A/E	74	1	73	2	72	3	71 T	4	**70 R**	**5**	S689 / Feasible
R11.18	709 Ocean View Avenue	78	78	81 A/E	78	3	76 T	5	73	8	71	10	**70 R**	**11**	S689 / Feasible
R11.19	734 Ocean View Avenue	71	71	74 A/E	74	0	73	1	73	1	73	1	72	2	Not Feasible
R11.20	775 Orpheus Avenue	70	70	72 A/E	70	2	69 T	3	68	4	**67 R**	**5**	67	5	S689 / Feasible
R11.21 C	801 Orpheus Avenue	67	67	70 N	--	--	--	--	--	--	--	--	--	--	--

T – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
2 – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
N – No noise impact.
C – This receptor represents a Fire Station, which is a Category C receptor with a NAC of 72 dBA. No noise impact occurs at this location.
K – A shielding factor of 5 dB has been applied to Receptor 10.12 to account for attenuation provided by first-row buildings.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
* – Non first-row receiver.

Table 3.15.23 (cont.): Predicted Future Noise Levels and Soundwall Feasibility for Segment 11

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Encinitas Boulevard to Leucadia Boulevard – NB															
R11.22[W]	247 Mangano Circle – West Hampton Cove Apts	66	66	68 [A/E]	--	--	67	1	65	3	64	4	**63[R]**	**5**	S680 / Feasible
R11.23[W]	165 Mangano Circle – West Hampton Cove Apts	70	70	72 [A/E]	--	--	70	2	68	4	**66[R]**	**6**	65	7	S680 / Feasible
R11.24	200 Saxony Road – Encinitas YMCA	72	72	74 [A/E]	70[T]	4	**68[R]**	**6**	67	7	66	8	65	9	S680 / Feasible
R11.25	200 Saxony Road – Encinitas YMCA	71	71	73 [A/E]	**68[R,T]**	**5**	67	6	66	7	66	7	65	8	S680 / Feasible
R11.26	342 Carmel Creeper Place	67	70	72 [A/E]	68[T]	4	**65[R]**	**7**	63	9	61	11	60	12	S686B/C / Feasible
R11.27	Saxony Condominiums - Park	70	73	77 [A/E]	**71[R,T]**	**6**	69	8	66	11	65	12	63	14	S686A / Feasible
R.11.28	402 Carmel Creeper Place	66	69	72 [A/E]	69[T]	3	**67[R]**	**5**	65	7	64	8	63	9	S686B/C / Feasible
R11.29	501 Union Street	69	72	75 [A/E]	72[T]	3	71	4	71	4	71	4	**70[R]**	**5**	S688 / Feasible
R11.30*	559 Union Street	66	69	71 [A/E]	69	2	69	2	68	3	68	3	68	3	Not Feasible
R11.31	Poinsettia Park	69	72	75 [A/E]	72	3	71[T]	4	**70[R]**	**5**	69	6	68	7	S692 / Feasible
R11.31A	Poinsettia Park	67	70	72 [A/E]	69	3	68[T]	4	**66[R]**	**6**	65	7	65	7	S692 / Feasible
R11.32	682 Clark Avenue	72	75	78 [A/E]	72[T]	6	70	8	**69[R]**	**9**	67	11	66	12	S692 / Feasible
R11.33	752 Clark Avenue	65	68	70 [A/E]	67[T]	3	67	3	66	4	**65[R]**	**5**	65	5	S692 / Feasible
R11.34	796 Clark Avenue	70	73	75 [A/E]	72[T]	3	70	5	69	6	**68[R]**	**7**	67	8	S692 / Feasible
R11.35	816 Clark Avenue	74	75	77 [A/E]	72[T]	5	70	7	**69[R]**	**8**	67	10	66	11	S692 / Feasible
R11.36	637 Leucadia Boulevard	68	69	73 [A/E]	69[T]	4	68	5	**67[R]**	**6**	66	7	66	7	S692 / Feasible
R11.37	607 Leucadia Boulevard	59	60	62 [N]	--	--	--	--	--	--	--	--	--	--	--

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[N] – No noise impact.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – Receivers R11.22 and R11.23 include the benefits of an existing nine-ft high wall.
* – Non first-row receiver.

Table 3.15.24: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 11

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S680	R11.22 – R11-25	30 MFR and 1 REC (12 Frontage Units)	R/W and Private Property / NB	8 ft to 16 ft / 2178 ft	$2,224,864	$1,596,000	Not Reasonable	Not Recommended
S686A	R11.27	1 Park (2 Frontage Units)	Private Property / NB	8 ft / 276 ft	$300,628	$84,000	Not Reasonable	Recommended for SI[3]
S686B & S686C	R11.26, R11.28	16 SFR	Private Property / NB	10 ft / 505 ft	$478,480	$640,000	Reasonable	Recommended
S688	R11.29	1 SFR	Shoulder / NB	16 ft / 443 ft	$375,374	$50,000	Not Reasonable	Recommended for SI[3]
S689	R11.5A – R11.20	26 SFR	R/W and Shoulder / SB	12 ft to 16 ft / 4529 ft	$1,966,677	$1,456,000	Not Reasonable	Recommended for SI[3]
S692	R11.31 – R11.36	10 SFR and 1 Park (6 Frontage Units)	R/W and Shoulder / NB	12 ft to 14 ft / 1778 ft	$1,331,713	$864,000	Not Reasonable	Recommended For SI[3]

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way

SEGMENT 12 – Leucadia Boulevard to La Costa Avenue

Areas with Noise Abatement

Table 3.15.25 includes the existing and future noise levels for each receptor, the site address for each receptor location, and the soundwall feasibility analysis based on the required minimum 5 dB I.L. *Table 3.15.26* includes each feasible soundwall location, height, and length, the number of benefited residences, cost reasonableness, and the preliminary decision to build. Receptor locations for Segment 12 are shown in *Figures 2-2.3, Sheets 37* through *40*. The following paragraphs describe the preliminary abatement decisions for Segment 12.

Soundwall S702: Soundwall S702 would be located in the right-of-way, on the northbound side of I-5, north of Leucadia Boulevard. Soundwall S702 would provide feasible noise reduction to one single-family residence located at the corner of Piraeus Street and Sparta Drive, represented by Receptor 12.34 (*Table 3.15.25*). Soundwall S702 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.26*). Therefore, S702 would not be recommended (*Table 3.15.26*).

Soundwall S706: Soundwall S706 would be located in the right-of-way, on the northbound side of I-5, north of Leucadia Boulevard. Soundwall S706 would provide feasible noise reduction to one single-family residence represented by Receptor 12.39 (*Table 3.15.25*). Soundwall S706 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.26*). Therefore, S706 would not be recommended (*Table 3.15.26*).

Soundwall S709: Soundwall S709 would be located in the right-of-way, and along the southbound shoulder of I-5, just south of La Costa Avenue. The soundwall would provide a feasible reduction in highway traffic noise for 14 single-family residences represented by Receptors R12.5, R12.12, R12.14, R12.14A, R12.16, R12.16A, R12.17, and R12.19; and 11 multi-family residences represented by Receptors R12.22, R12.24, and R12.26A. A feasible noise reduction would not be provided for Receptors R12.4, R12.6, R12.7, R12.8, R12.9, R12.10, R12.11, R12.12A, R12.13, R12.15, R12.18, R12.20, R12.21, R12.23, R12.25, R12.26, R12.27, and R12.28 (*Table 3.15.25*). Receptors R12.4, R12.5, R12.6, R12.7, R12.14, R12.16, R12.19, and R12.21 are predicted to be severely impacted with noise levels at or higher than 75 dBA with the build alternatives (*Table 3.15.26*). Soundwall S709 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.26*). Construction would not be recommended as proposed (*Table 3.15.26*). It would instead be recommended that the severely impacted receptors, R12.4, R12.5, R12.6, R12.7, R12.14, R12.16, R12.19, and R12.21 receive individual abatement.

Soundwall S719: Soundwall S719 would be located on private property and in the right-of-way along southbound I-5, just south of La Costa Avenue. Soundwall S719 would provide a feasible reduction in highway traffic noise for one single-family residence represented by Receptor 12.29 (*Table 3.15.25*). Soundwall S719 would not be reasonable to construct due to the estimated construction cost exceeding the reasonable allowance (*Table 3.15.26*). Therefore, S719 would not be recommended (*Table 3.15.26*).

Areas without Noise Abatement

Receptors R12.1 through R12.3: These receptors are located on the southbound side of I-5, just north of Leucadia Boulevard. It would not be feasible to abate for highway traffic noise in this area due to the elevation of the receptors with respect to the freeway and the right-of-way (*Table 3.15.25*). Locating a soundwall outside Caltrans right-of-way, on the eastern edge of Orpheus Avenue would also not be feasible because it would block access to the land between Orpheus Avenue and the freeway (*Table 3.15.25*).

Receptors R12.27 and R12.28: Receptors R12.27 and R12.28 represent single-family residences located on the southbound side of I-5, south of La Costa Avenue. An existing soundwall is located on the shoulder of the southbound La Costa Avenue on-ramp. A soundwall would not provide feasible noise reduction for any of the receptors (*Table 3.15.25*). Also, it would not be practical to build a soundwall at the property line of these residences due to the topography of the area.

Receptors R12.31 to R12.33: Receptors R12.31 through R12.33 represent a group of single-family residences located on the northbound side of I-5, just north of Leucadia Boulevard. Receptor R12.31 is located between Leucadia Boulevard and the entrance to the Leucadia Boulevard on-ramp, which would be realigned with the build alternatives. This would limit the area available for a soundwall for R12.31. There is an existing 7-ft-high property wall at the residences represented by Receptor R12.32. Replacing this existing wall with a soundwall would not provide feasible noise reduction for Receptors R12.31 or R12.32 (*Table 3.15.25*). It would provide a feasible noise reduction to Receptor R12.33, which represents one single-family residence (*Table 3.15.25*); however, a soundwall would not be practical for only one residence.

Receptors R12.35 through R12.38: Receptors R12.35 through R12.38 represent single-family residences in a new housing development located on the northbound side of I-5. There is an existing 6- to 7-ft-high high property wall along the backyards of these residences. A soundwall located on the right-of-way would not provide a feasible noise reduction for these receptors (*Table 3.15.25*).

Receptors R12.43 through R12.48: These receptors are located on the northbound side of I-5, just south of La Costa Avenue. A feasible reduction in highway traffic noise could not be achieved in this area because the receptors are elevated by approximately 65 to 80 ft above the freeway and the right-of-way (*Table 3.15.25*). A soundwall at the property line of these receivers would also not provide feasible noise reduction due to the topography of the area (*Table 3.15.25*).

Table 3.15.25: Predicted Future Noise Levels and Soundwall Feasibility for Segment 12

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Leucadia Boulevard to La Costa Avenue – SB															
R12.1*	930 Orpheus Avenue	65	66	69 A/E	69	0	69	0	68	1	66	1	68	1	Not Feasible
R12.2	960 Orpheus Avenue	70	71	73 A/E	73	0	72	1	72	1	718	2	71	2	Not Feasible
R12.3	1030 Orpheus Avenue	70	71	73 A/E	73	0	73	0	73	0	72	1	72	1	Not Feasible
R12.4	1034 Orpheus Avenue	73	74	76 A/E	75	1	74	2	74	2	**73 R,X,I**	**3**	72	4	Not Feasible
R12.5	1040 Orpheus Avenue	74	75	78 A/E	76	2	76	2	75	3	**73 R,T**	**5**	72	6	S709 / Feasible
R12.6	1144 Orpheus Avenue	71	72	75 A/E	74	1	74	1	73	2	**72 R,X**	**3**	72	3	Not Feasible
R12.7	1214 Orpheus Avenue	72	73	76 A/E	75	1	75	1	74	2	**73 R,X,T**	**3**	72	4	Not Feasible
R12.8*	1217 Eolus Avenue	70	71	73 A/E	73	0	73	0	73	0	73	0	72	1	Not Feasible
R12.9	1280 Orpheus Avenue	71	72	74 A/E	74	0	74	0	73	1	73	1	72	2	Not Feasible
R12.10	521 East Glaucus Street	68	69	71 A/E	71	0	71	0	71	0	70	1	70	1	Not Feasible
R12.11	520 East Glaucus Street	68	69	72 A/E	71	1	71	1	70	2	70	2	69	3	Not Feasible
R12.12[M]	1362 Orpheus Avenue	73	74	77 A/E	74	3	73	4	71	6	69	8	68	9	Feasible
R12.12A[K]	1362 Orpheus Avenue	64	65	68 A/E	67	1	67	1	66	2	65	3	64	4	Not Feasible
R12.13*	1345 Eolus Avenue	67	68	71 A/E	70	1	70	1	70	1	69	2	69	2	Not Feasible
R12.14	1374 Orpheus Avenue	72	73	75 A/E	73	2	72	3	71 I	4	70	5	**68 R**	**7**	S709 / Feasible
R12.14A[K]	1390 Orpheus Avenue	66	67	69 A/E	68	1	67	2	66 I	3	65	4	**64 R**	**5**	S709 / Feasible
R12.15	1403 Eolus Avenue	69	70	72 A/E	71	1	71	1	71	1	70	2	70	2	Not Feasible
R12.16	1442 Orpheus Avenue	71	72	75 A/E	73	2	72	3	70 I	5	69	6	**68 R**	**7**	S709 / Feasible
R12.16A[K]	1448 Orpheus Avenue	65	66	69 A/E	67	2	66	3	65 I	4	63	6	**62 R**	**7**	S709 / Feasible
R12.17	1472 Orpheus Avenue	70	71	74 A/E	72	2	70 I	4	69	5	68	6	**67 R**	**7**	S709 / Feasible
R12.18*	1468 Orpheus Avenue	69	70	72 A/E	71	1	71	1	70	2	70	2	70	2	Not Feasible
R12.19	1530 Orpheus Avenue	72	72	75 A/E	73	2	73	2	72	3	71	4	**70 R**	**5**	S709 / Feasible
R12.20	1565 Eolus Avenue	68	68	71 A/E	71	0	71	0	71	0	70	1	70	1	Not Feasible
R12.21	1593 Eolus Avenue	75	75	77 A/E	76	1	76	1	75	2	75	2	**74 R,X**	**3**	Not Feasible

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
A/E – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
K – A shielding factor of 5 dB has been applied to Receptors R12.12A, R12.14A, and R12.16A to account for attenuation provided by first-row buildings.
M – This receptor represents a measurement site. It is not an area of frequent human use.
R – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
T – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
X – Soundwall S709 would be recommended for these receivers because future noise levels are 75 dBA or greater, which would otherwise necessitate the consideration of unusual and extraordinary abatement strategies such as building insulation.
* – Non first-row receiver.

Table 3.15.25 (cont.): Predicted Future Noise Levels and Soundwall Feasibility for Segment 12

Receptor No.	Site Address	Existing Noise Levels[1] $L_{eq}(h)$, dBA	Future Peak Hour Noise Levels, $L_{eq}(h)$, dBA[1,2]												Soundwall No. / Feasibility
			Future "No Build"	Project "Build" without Soundwall	Noise Prediction with Soundwall and Soundwall Insertion Loss (I.L.)										
					8 ft		10 ft		12 ft		14 ft		16 ft		
					$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	$L_{eq}(h)$	I.L.	
Leucadia Boulevard to La Costa Avenue – SB (Continued)															
12.22[W]	586 Southbridge Court	67	68	71 [A/E]	67[I]	4	66	5	65	6	64	7	**64[R]**	**7**	S709 / Feasible
R12.23[W]	583 Nantucket Court	65	66	68 [A/E]	67	1	67[I]	1	66	2	65	3	64	4	Not Feasible
R12.24[W]	576 Leucadia Village Court	69	70	72 [A/E]	71	1	70	2	68[I]	4	67	5	**66[R]**	**6**	S709 / Feasible
R12.25	Leucadia Park - Pool	67	67	69 [A/E]	69	0	69[I]	0	68	1	67	2	66	3	Not Feasible
R12.26	Leucadia Park - Tennis Court	68	68	70 [A/E]	70	0	69	1	69[I]	1	68	2	68	2	Not Feasible
R12.26A[W]	595 Leucadia Village Court	69	69	72 [A/E]	71	1	71	1	70[I]	2	68	4	**67[R]**	**5**	S709 / Feasible
R12.27	1923 Leucadia Scenic Court	70	70	72 [A/E]	72	0	72	0	72	0	72	0	72	0	Not Feasible
R12.28[W]	1940 Leucadia Scenic Court	65	65	68 [A/E]	68	0	68	0	68	0	68	0	68	0	Not Feasible
R12.29	579 La Costa Avenue	72	72	74 [A/E]	**69[R,T]**	**5**	67	7	66	8	65	9	64	10	S719 / Feasible
R12.30	561 La Costa Avenue	66	66	67 [A/E]	66	1	66	1	66	1	66	1	66	1	Not Feasible
Leucadia Boulevard to La Costa Avenue – NB															
R12.31	636 Leucadia Boulevard	65	68	70 [A/E]	69	1	69	1	68	2	68	2	68	2	Not Feasible
R12.32[W]	949 Piraeus Street	64	67	69 [A/E]	69	0	68	1	67	2	67	2	66	3	Not Feasible
R12.33	975 Piraeus Street	68	71	73 [A/E]	71	2	70	3	69	4	68	5	68	5	Not Feasible
R12.34	633 Sparta Drive	68	71	74 [A/E]	72	2	71	3	70	4	70	4	**69[R]**	**5**	S702 / Feasible
R12.35[W]	1212 Skyros Way	69	71	73 [A/E]	73	0	72	1	71	2	70	3	69	4	Not Feasible
R12.36[W]	1258 Skyros Way	68	71	73 [A/E]	72	1	71	2	71	2	71	2	70	3	Not Feasible
R12.37[W]	1288 Skyros Way	67	70	72 [A/E]	71	1	70	2	70	2	69	3	69	3	Not Feasible
R12.38[W]	1344 Skyros Way	66	69	71 [A/E]	70	1	70	1	70	1	69	2	69	2	Not Feasible
R12.39	1411 Piraeus Street	68	71	71 [A/E]	69[T]	2	68	3	67	4	67	4	**66[R]**	**5**	S706 / Feasible
R12.40	1437 Piraeus Street	71	69	70 [A/E]	68[I]	2	68	2	67	3	66	4	66	4	Not Feasible
R12.41*	1423 Arbor Court	65	68	69 [A/E]	68	1	67	2	67	2	66	3	66	3	Not Feasible
R12.42	1433 Piraeus Street	66	69	70 [A/E]	69	1	68	2	68	2	67	3	67	3	Not Feasible
R12.43	1570 Caudor Street	62	65	66 [A/E]	--	--	--	--	--	--	--	--	--	--	--
R12.44	746 Plato Place	60	63	65 [N]	--	--	--	--	--	--	--	--	--	--	--
R12.45	750 Plato Place	61	64	66 [A/E]	--	--	--	--	--	--	--	--	--	--	--
R12.46	1660 Leora Lane	60	63	66 [A/E]	--	--	--	--	--	--	--	--	--	--	--
R12.47	1645 Noma Lane	61	64	66 [A/E]	--	--	--	--	--	--	--	--	--	--	--
R12.48	1748 Noma Lane	67	70	73 [A/E]	--	--	--	--	--	--	--	--	--	--	--

[1] – $L_{eq}(h)$ is A-weighted, peak hour noise levels in decibels.
[2] – Traffic noise from the freeway only; other local noise sources are not included.
[A/E] – Approaches or Exceeds the NAC of 67 dBA for Activity Category B receptors.
[N] – No noise impact.
[R] – Recommended height to meet feasibility requirements of Caltrans Noise Abatement Protocol.
[T] – Minimum height required to block the line-of-sight from the receptor to truck exhaust stacks.
[W] – The existing and future noise levels at this receiver include the benefits of an existing property wall.
* – Non first-row receiver.

Table 3.15.26: Summary of Feasible Soundwalls and Preliminary Abatement Decision for Segment 12

Soundwall No.	Receptor No.	Type[1] and No. of Benefited Residences	Soundwall Location / Hwy Side	Soundwall Height / Total Length	Estimated Construction Cost[2]	Reasonable Total Allowance	Reasonableness	Preliminary Abatement Decision
S702	R12.34	1 SFR	R/W / NB	16 ft / 574 ft	$189,079	$48,000	Not Reasonable	Not Recommended
S706	R12.39	1 SFR	R/W / NB	16 ft / 892 ft	$292,802	$48,000	Not Reasonable	Not Recommended
S709	R12.4, R12.5, R12.6, R12.7, R12.14, R12.14A, R12.16, R12.16A, R12.17, R12.19, R12.21, R12.22, R12.24, and R12.26A	14 SFR and 11 MFR	Shoulder and R/W /SB	14 ft and 16 ft / 5463 ft	$4,686,290	$1,050,000	Not Reasonable	Not Recommended Individual Abatement for SI[3]
S719	R12.29	1 SFR	R/W / SB	8 ft / 364 ft	$275,469	$36,000	Not Reasonable	Not Recommended

[1] – Land Use: SFR – single-family residence; MFR – multi-family residence; SCH – school; REC – recreational
[2] – Estimated construction cost includes cost of easements
[3] – SI – Severely Impacted
R/W – right-of-way