Thermoplastic stripe is routinely removed as part of highway reconstruction. Caltrans would include special provisions in the construction contract that require these materials be removed in accordance with all applicable laws and regulations.

Before demolishing any asbestos-containing structures, the contractor would comply with all applicable Santa Barbara County Air Pollution Control District regulations. Any asbestos removal would be done by following all applicable laws and regulations. In addition, as stated in the National Elimination System for Hazardous Air Pollutants, a notification would be filed.

2.2.6 Air Quality

Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws 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. Standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO2). See Table 2.29.

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second at the project level. The proposed project must conform at both levels to be approved.

Regional-level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide, nitrogen dioxide, ozone, and particulate matter (see Table 2.29). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the Regional Transportation Plan, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Santa Barbara County

Association of Governments for Santa Barbara County and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the Regional Transportation Plan is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the Regional Transportation Plan must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the Regional Transportation Plan, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project level also requires "hot spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide and/or particulate matter. A region is a "nonattainment" area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called "maintenance" areas. "Hot spot" analysis is essentially the same, for technical purposes, as carbon monoxide or particulate matter analysis performed for National Environmental Policy Act purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the carbon monoxide standard to be violated, and in "nonattainment" areas the project must not cause any increase in the number and severity of violations. If a known carbon monoxide or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

An Air Quality Study Report was prepared for the project in November 2010. An addendum to the Air Quality Study Report was prepared February 2, 2012. A subsequent addendum was prepared April 22, 2013 to address the topic of entrained dust. The study area falls under the Santa Barbara County Air Pollution Control District's Clean Air Plan, approved in 2007.

Santa Barbara County's air quality is influenced by both local topography and meteorological conditions.

Topography

The project sits on a coastal terrace on the south-facing coast of southern Santa Barbara County. The area is bound to the west and south by the Pacific Ocean and to the north by the Santa Ynez Mountains with elevations up to 4,600 feet. The distance

from the highway to the crest of the Santa Ynez Mountains Range is about 4.5 miles. Farther north are the San Rafael Mountains with elevations up to 6,800 feet.

Meteorology

Surface and upper-level wind flow varies both seasonally and geographically in the county, and inversion conditions common to the area can affect the vertical mixing and dispersion of pollutants. The prevailing wind flow patterns in the county are not necessarily those that cause high ozone values. In fact, high ozone values are often associated with atypical wind flow patterns.

Semi-permanent high pressure lying off the Pacific Coast leads to limited rainfall (around 18 inches per year), with warm, dry summers and relatively damp winters. Maximum summer temperatures average about 70 degrees Fahrenheit near the coast and in the high 80s to 90s inland. During winter, average minimum temperatures range from the 40s along the coast to the 30s inland. Additionally, cool humid marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in the late spring and early summer. The fog and low clouds can persist for several days until being broken up by a change in the weather pattern.

The sea breeze (from sea to land) is typically from the southwest in the southern portion of the county. During summer, these winds are stronger and persist later into the night. At night, the sea breeze weakens and is replaced by light land breezes (from land to sea). The alternation of the land-sea breeze cycle can sometimes produce a "sloshing" effect, where pollutants are swept offshore at night and subsequently carried back onshore during the day. This effect is worse during periods when wind speeds are low.

Santa Barbara County experiences a variety of wind patterns. East of Point Conception eddies flow in a counter-clockwise direction and cause highly variable winds along the southern coastal strip. Warm, dry Santa Ana winds blow from the high inland desert and descend down the slopes of the mountain range. During Santa Ana conditions, pollutants emitted in Santa Barbara, Ventura County, and the South Coast Air Basin (the Los Angeles region) are moved out to sea. These pollutants can then be moved back onshore into Santa Barbara County in what is called a "post-Santa Ana condition." The effects of the post-Santa Ana condition can be experienced throughout the county. Not all post-Santa Ana conditions, however, lead to high pollutant concentrations in Santa Barbara County.

Upper-level winds are generally from the north or northwest throughout the year, but occurrences of southerly and easterly winds do occur in winter, especially during the morning. Upper-level winds from the south and east are infrequent during the summer. When these winds do occur during summer, they are usually associated with periods of high ozone levels. Surface and upper-level winds can move pollutants that originate in other areas into the county.

Surface temperature inversions (0 to 500 feet) are most frequent during the winter, and subsidence inversions (1,000 to 2,000 feet) are most frequent during the summer. Inversions are an atmospheric condition in which the air temperature rises with increasing altitude. Inversions hold surface air down and prevent the dispersion of pollutants. They act as a cap to the pollutants that are emitted below or within them, and consequently ozone concentrations are often higher directly below the base of higher inversions than they are at the earth's surface.

A subsidence inversion is very common during summer along the California coast and is one of the main causes of "air stagnation" (high, stability-restricted air movement). Air stagnation frequently causes poor air quality. Therefore, it is reasonable to expect a higher frequency of pollution in the southern portion of the county where light winds are frequently observed, as opposed to the northern part of the county where the prevailing winds are usually strong and persistent.

Environmental Consequences

The Federal Highway Administration and Environmental Protection Agency issued final air quality conformity guidelines in December 1993. The conformity guidelines list certain categories of projects that are exempt from local and regional air quality analysis because they have little if any potential to degrade air quality. Examples of these projects include safety improvement programs, pavement resurfacing and/or rehabilitation, and operational improvements that relieve congestion. These kinds of projects are exempt from the requirement that an air quality conformity determination be made according to Title 40 Code of Federal Regulations Section 93.126.

Since the Santa Barbara County Air Pollution Control District is in attainment for all National Ambient Air Quality Standards, the project is exempt from project-level emission analysis at the federal level. Additionally, since the project has been initiated as a congestion relief/operational improvement, it is not expected to increase local concentrations of air pollutants; therefore it is consistent with the state air quality goals of the air district.

Regional Air Quality Conformity

The project is in an attainment/unclassified area for all current federal air quality standards (see Tables 2.29 and 2.30). Therefore, conformity requirements do not apply.

Table 2.29 Air Quality Table

Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources
Ozone (O_3)[a]	1 hour 8 hours	0.09 ppm 0.070 ppm	–[b] 0.075 ppm	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.	Low-altitude ozone is almost entirely formed from reactive organic gases (ROG) and nitrogen oxides (NO_x) in the presence of sunlight and heat. Sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes. Biologically-produced ROG may also contribute.
Carbon monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[c] 6 ppm	35 ppm 9 ppm –	Asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Respirable particulate matter (PM10)[a]	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 –	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and death. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM10.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
Fine particulate matter (PM2.5)[a]	24 hours Annual	– 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter–considered a toxic air contaminant–is in the PM2.5-size range. Many aerosol and solid compounds are part of PM2.5.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_x, sulfur oxides (SO_x), ammonia, and ROG.
Nitrogen dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.	Motor vehicles and other mobile sources; refineries; industrial operations.
Sulfur dioxide (SO_2)	1 hour 3 hours 24 hours Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.030 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing.
Lead (Pb)[d]	Monthly Quarterly	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also considered a toxic air contaminant.	Primary: lead-based industrial process like batter production and smelters. Past: lead paint, leaded gasoline. Moderate to high levels of aerially deposited lead from gasoline may still be in soils along major roads and can be a problem if large amounts of soil are disturbed.

Sources: California Air Resources Board Ambient Air Quality Standards chart, February 16, 2010

Table 2.30 Federal and State Attainment Status

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3) (see footnote 8)	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	—	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)[9]
	3 Hour	—		—	0.5 ppm (1300 µg/m^3) (see footnote 9)	
	1 Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3) (see footnote 9)	—	
Lead[10]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			
See footnotes on next page …						
For more information please call ARB-PIO at (916) 322-2990						California Air Resources Board (09/08/10)

Source: http://www.arb.ca.gov/desig/adm/adm.htm - 2010 Standards

Footnotes for Table 2.30:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be NESHA California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, 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 U.S. EPA 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 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C 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. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

9. On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO2 standard of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the new primary 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.

10. The ARB 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.

11. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Ambient Air Quality

Existing air quality conditions in the project area can be characterized in terms of the ambient air quality standards that the federal and state governments have established for various pollutants and monitoring data collected in the region. The following air quality data in Table 2.31 were collected from the Santa Barbara -700 East Canon Perdido Monitoring Station.

Table 2.31 Summary of Ambient Air Quality Monitoring Data in Comparison to National Ambient Air Quality Standards (NAAQS)

NAAQS/Monitoring Period	Number of Days Exceeding NAAQS		
Pollutant	**2008**	**2009**	**2010**
Ozone Max 1-hr/8-hr concentrations (ppm)	0.076/0.064	0.091/0.077	0.075/0.061
Number of days exceeding standards 1-hr/8-hr	0/0	0/1	0/0
PM2.5 max 24-hr concentration (µg/m3)	44.2	25.3	12.1
Number of days exceeding standard	1	0	0
National annual average	10.4	No data	No data
PM10 max 24-hr concentration (µg/m3)	No data available	No data available	No data available
Number of days exceeding standard	No data	No data	No data
National Annual Average	No data	No data	No data
CO max 8-hr concentrations (ppm)	1.69	1.57	1.07
Number of days exceeding 8-hr standards	0	0	0

Source: CARB website

Based on the data collected from the Santa Barbara-700 East Canon Perdido Monitoring Station (Table 2.30), the federal 8-hour standard has been exceeded one time in 2009, and the federal $PM_{2.5}$ standard has been exceeded one time in 2008. Insufficient or no data is available for PM_{10} federal standards. There have been no records indicating that carbon monoxide standards were exceeded.

The proposed South Coast 101 HOV Lanes project is consistent with and included in the Santa Barbara County Association of Governments-approved 2040 Regional Transportation Plan and Sustainable Communities Strategy. This plan was approved by the Federal Highway Administration in 2013. It is also included in the 2012 Metropolitan Transportation Plan amended into the Santa Barbara County Association of Governments-approved 2013 Federal Transportation Improvement Program. In addition, the project is consistent with the assumptions in the association's regional emissions analysis. These plans are deemed consistent with the applicable State Implementation Program that is the 2013 (draft) Clean Air Plan. Therefore, the project is consistent with the Clean Air Plan, which is the applicable State Implementation Plan for Santa Barbara County.

The project is scoped as an operational improvement/congestion relief action, which would help improve traffic circulation, a transportation control measure listed in the

Air District's Clean Air Plan. The project is not expected to have a significant adverse impact on long-term air quality. Long-term operational emissions associated with the proposed project are due mainly to the existing operation of motor vehicles in the project vicinity. The proposed project would improve highway circulation and reduce vehicle queuing during peak hour periods, thereby avoiding any significant adverse change in local or regional air quality caused by the project. Daily traffic volumes on U.S. 101, after completion of the project, would be about the same as under no-build conditions, but the overall system would function more efficiently.

The proposed project would improve circulation on local streets during peak periods because fewer drivers would seek out alternative routes in the corridor as they commonly do during severely congested conditions. When local trips are diverted from the highway system onto local streets, it creates additional low speed and idle emissions in closer proximity to sensitive air receptor locations and, as local streets begin to exceed their capacity, creates even more gridlock spread out over a much larger area. With the project built, these trips would be redirected back to the highway system, away from local streets. Therefore, there should be no significant adverse change in local or regional air quality caused by the project.

Table 2.32 compares expected highway performance between the build alternatives and the No-Build Alternative.

Table 2.32 Forecast Measure of Effectiveness Summary

Performance Measurement	No-Build 2040	Build 2040
Northbound morning average speed (miles per hour)	34	57
Southbound afternoon average speed (miles per hour)	48	59
Northbound morning peak hour average speed (miles per hour)	26.2	40.5
Southbound afternoon peak hour average speed (miles per hour)	39.8	52.2
Northbound morning peak hour average travel time (minutes)	48.5	29.3
Southbound afternoon peak hour average travel time (minutes)	34.7	24.5
Northbound morning hours of delay (vehicle hours)	9258	1492
Southbound afternoon hours of delay (vehicle hours)	3383	1122

Source: South Coast 101 HOV Lanes Traffic Study (Forecast Operations Report) prepared October 19, 2009 and amended December 9, 2011; also refer to Table 2.15 - Table 2.17.

Table 2.32 provides data only for morning and afternoon peak commute periods, when grid-lock and delay are at their worst. Off-peak emissions (assumed to be from 7:00 p.m. to 5:00 a.m.) are considered to be the same with either the build or no-build condition, because the highway, under normal operating conditions, would operate uncongested, freely flowing with minimal vehicle delays. As stated in the traffic analysis for the project, the percentage of trucks in the vehicle mix for analysis in the future years were assumed to be consistent with existing truck volumes.

The no-build condition sees a portion of total vehicle trips during the peak periods diverted onto local streets to avoid the congested highway. These diverted trips would be traveling at much lower speeds on local roads and have been added back into the overall emission inventory for the no-build condition.

Table 2.33 presents the emissions estimates for the existing and 2040 build condition versus no-build analysis under the above referenced assumptions using the Caltrans-approved air quality modeling program (CT-EMFAC). All estimates have been rounded to three decimal places.

Table 2.33 Pollutant Emission Estimates—Morning and Afternoon Peak

Pollutant	Existing 2009 (tons per year)	2040 No-Build (tons per year)	2040 Build (tons per year)	Project Difference (tons per year)
TOG	0.43429	0.190	0.194	0.004
SO_2	0.00579	0.011	0.011	0.000
Diesel PM	0.00846	0.007	0.009	0.002
$PM_{2.5}$	0.02469	0.040	0.042	0.001
PM_{10}	0.027	0.044	0.045	0.001
NO_X	1.0881	0.303	0.373	0.070
Formaldehyde	0.00825	0.003	0.004	0.001
CO_2	583.494	1052.468	1136.365	83.897
CO	6.3092	2.155	2.193	0.038
Butadiene	0.00204	0.001	0.001	0.000
Benzene	0.0103	0.004	0.004	0.000
Acrolein	0.00001	0.000	0.000	0.000
Acetylaldehyde	0.00209	0.001	0.001	0.000

Source: Air Quality Report for the South Coast 101 HOV Lanes project (November 2010)

Based on the project-specific peak-period analysis, the proposed project would have a negligible impact on air quality and would relieve a great deal of congestion on the existing through lanes of the highway while also improving low-speed and idling emissions. The slight increase in the 2040 build-condition emissions versus the 2040 no-build condition with respect to carbon dioxide is attributable to the addition of the HOV lanes, which allow higher traffic volumes on U.S. 101 (mostly from re-directed trips from the local street system) and improvement in average vehicle speeds. Optimum vehicle speeds for the combustion of fossil fuels and the subsequent release of emissions occurs at about 45 miles per hour. Carbon dioxide emission curves show an increase from that point as vehicles travel faster.

The closer a sensitive receptor is to the source of the emissions, the more the receptor is likely to be affected by those emissions. The greatest impacts generally occur to residents within 500 feet of the highway. Because the project would improve local circulation in the immediate area, allowing free-flowing movements with less vehicle backup and out-of-direction travel on local surface streets, the additional health risk posed by this project is considered to be negligible. The project would widen some overcrossings, but would not reconfigure intersections in the corridor, except at the interchanges of Cabrillo Boulevard/Hot Springs Road and Sheffield Drive.

Carbon Monoxide (CO) Analysis

Carbon monoxide is a low-speed emission that increases when vehicles idle for long periods of time, such as when waiting at traffic signals or in heavy congestion. The project would not create new intersections; it would reduce vehicle backups and idling times, and allow substantially higher speeds by relieving existing and projected congestion. Of the 15 air quality monitoring stations in Santa Barbara County, the Santa Barbara monitoring station is the only station close to the project. Using the carbon monoxide protocol (1997), developed by University of California, Davis for evaluating project level carbon monoxide impacts for transportation projects, it was determined that the proposed project is not required to conduct detailed emission modeling for carbon monoxide impacts per the process flowcharts. Therefore, impacts on carbon monoxide are expected to be negligible.

The four highest carbon monoxide readings at that station registered between 2.9 and 5.2 parts per million between January 2, 2008 and July 7, 2008. These measurements fall well below the federal and state concentration standards of 35 parts per million and 20 parts per million, respectively. Therefore, impacts from carbon monoxide are expected to be negligible.

Particulate Matter Analysis

Particulate matter emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere. The National Ambient Air Quality Standards for particulate matter applies to two classes of particulates: particulate matter 2.5 microns or less in diameter ($PM_{2.5}$) and particulate matter 10 microns or less in diameter (PM_{10}). Because Santa Barbara County is considered nonattainment with respect to state PM_{10} standards, the project complies with PM_{10} control measures, as applicable, in the local PM_{10} air quality plan (Air District Clean Air Plan, 2007). Using the Caltrans-approved air quality modeling program software, the 2040 build condition shows a slight increase with respect to PM_{10} versus the 2040 no-build condition (see Table 2.33).

A road dust analysis was done after public comments were received on the draft environmental document. Road dust was calculated and compared for the project's build alternatives and the No-Build Alternative for 2018 and 2040. Quantities for road dust are added only to PM_{10} emissions because road dust is not considered a significant contributor to $PM_{2.5}$ emissions. Calculations for road dust contributions to PM_{10} emissions show that in 2040 the difference between the build alternatives and the No-Build Alternative would be an increase of 73.89 pounds per day. The difference between the existing conditions and the build alternatives in 2040 is calculated to be 625.49 pounds. The increases seen for PM_{10} emissions within the project limits are caused by the large percentage of vehicles entering the highway from the local roads they typically traveled to avoid the existing congestion conditions on the highway. Although there would be an increase of PM_{10} emissions on U.S. 101 within the project limits, the local roadways would experience an overall decrease in PM_{10} emissions.

Mobile Source Air Toxics

Mobile source air toxics (MSAT) are 21 compounds emitted from highway vehicles and non-road equipment that are known to cause or suspected of causing cancer or other serious health ailments. There are six main toxics, including diesel exhaust, benzene, and formaldehyde (see Table 2.34).

The Federal Highway Administration has developed a tier approach for analyzing mobile source air toxics. The Federal Highway Administration has identified three different categories of analysis that depend on specific project circumstances:

1. No analysis for projects with no potential for meaningful mobile source air toxics effects. This category is limited to projects that:
   a) Qualify as a categorical exclusion under 23 Code of Federal Regulations 771.117(c)
   b) Are exempt under the Clean Air Act conformity rule under 40 Code of Federal Regulations 93.126, or
   c) Have no meaningful impacts on traffic volumes or vehicle mix
2. Qualitative analysis for projects with low potential mobile source air toxics effects. Projects that do not meet category (1) or (3) criteria should be included in this category.
3. Quantitative analysis to differentiate alternatives for projects with higher potential mobile source air toxics effects.

Using the Federal Highway Administration Interim Guidance, the project falls under category (2), which means the project has a low potential for mobile source air toxic effects. Therefore, qualitative analysis is required.

Table 2.34 Typical Pollutant Emission Estimates Related to Mobile Source Air Toxics

Pollutant	Existing 2009 (tons/year)	2040 No-Build (tons/year)	2040 Build (tons/year)	Difference (tons/year)
Diesel PM	0.00846	0.007	0.009	0.002
Formaldehyde	0.00825	0.003	0.004	0.001
Butadiene	0.00204	0.001	0.001	0.000
Benzene	0.0103	0.004	0.004	0.000
Acrolein	0.00001	0.000	0.000	0.000
Acetylaldehyde	0.00209	0.001	0.001	0.000

Source: South Coast 101 HOV Lane Air Quality Report Addendum (February 2, 2012)

The South Coast 101 HOV Lanes project proposes to add capacity to the highway mainly by widening in the existing median of the highway. When the widening occurs in the median, the action would not move sources of air toxics (primarily diesel trucks) nearer to sensitive receptors, and should not increase the local burden of these pollutants. When outside widening is required, traffic would be moved about 12

feet closer to sensitive receptors next to the highway than the existing condition, which is not considered to be substantial change from present conditions.

Mobile source air toxics have the potential to affect sensitive receptors, specifically schools, medical centers and healthcare facilities, childcare facilities, parks, and playgrounds within a 500-foot radius of the edge of traveled way. The following sensitive receptors are within 500 feet of the proposed edge of traveled way:

- Dwight Murphy Park
- Santa Barbara Municipal Tennis Stadium
- Santa Barbara Zoo
- Andrée Clark Bird Refuge
- Montecito Golf Course
- Medical Facilities off Coast Village Road
- Lookout Park, Summerland
- Oceanview Park, Summerland
- Carpinteria Creek Park
- Summerland Elementary School
- Loon Point, near Summerland

For each build alternative, the amount of mobile source air toxics emitted would be proportional to the vehicle miles traveled, assuming that other variables, such as the mix of vehicle types, are the same for each alternative. The vehicle miles traveled estimated for each of the build alternatives is slightly higher than that for the no-build condition (see Table 2.33) because the additional capacity increases the efficiency of the freeway and attracts diverted or re-routed trips from elsewhere in the transportation network.

This increase in vehicle miles traveled would lead to higher mobile source air toxics emissions along the highway corridor, along with a corresponding decrease in mobile source air toxics emissions along the parallel routes. The emissions increase is offset somewhat by lower mobile source air toxics emission rates due to increased speeds (as documented by the Environmental Protection Agency's MOBILE 6.2 emissions model, emissions of all the priority mobile source air toxics except for diesel particulate matter decrease as speed increases). The extent to which these speed-

related emissions decreases might offset distance-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated vehicle miles traveled under each of the build alternatives are the same, there would be no difference in overall mobile source air toxics emissions among the design alternatives. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of the Environmental Protection Agency's national control programs that are projected to reduce annual mobile source air toxics emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover vehicle miles traveled growth rates, and local control measures. However, the magnitude of the reductions projected by the Environmental Protection Agency is so great (even after accounting for vehicle miles traveled growth) that mobile source air toxics emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the proposed project build alternatives would have the effect of slightly moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of mobile source air toxics could be higher under certain build alternatives than the no-build condition. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific mobile source air toxics health impacts.

In summary, when a highway is widened, the localized level of mobile source air toxics emissions for the build alternatives could be higher relative to the no-build condition, but this is expected to be offset by increases in speeds and reductions in congestion (which are associated with lower mobile source air toxics emissions). Also, mobile source air toxics would be lower in other locations when traffic shifts away from them. However, on a regional basis, the Environmental Protection Agency's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause region wide mobile source air toxics levels to be significantly lower than today.

Naturally Occurring Asbestos

Santa Barbara County is among the counties listed as containing serpentine and ultramafic rock (Governor's Office of Planning and Research, October 26, 2000).

However, according to the *Geologic Map of the Carpinteria Quadrangle, Santa Barbara County, California* (Thomas Dibblee Jr., 1986), the nearest ultramafic rock occurrence is about 7 miles northeast of the project area on the north side of the Santa Ynez Mountain Range. Therefore, no impact from naturally occurring asbestos is anticipated during project construction.

Asbestos-Containing Materials

The Asbestos- and Lead-containing Paint Survey (see Section 2.25) documented that asbestos-containing materials were found on the following structures: Cabrillo Boulevard undercrossing, Evans Avenue undercrossing, South Padaro Lane undercrossing, and the Santa Monica Creek Bridge. These same materials are assumed to be present on the Arroyo Parida Creek Bridge. Chrysotile asbestos was detected in the concrete drainpipe inserts on the Cabrillo Boulevard undercrossing.

Several other structures also contain asbestos sheet packing used in barrier rail systems. These structures include the Evans Avenue undercrossing, South Padaro Lane undercrossing, Arroyo Parida Creek Bridge, and Santa Monica Creek Bridge. The Asbestos and Lead-containing Paint Survey recommends a licensed registered contractor with the California Occupational Safety and Health Administration for asbestos-related work perform the removal of such materials. The contractor would have to comply with the rules and regulations of the Santa Barbara County Air Pollution Control District and file a notification as required by the National Elimination System for Hazardous Air Pollutants before demolishing any of these structures.

Refer to Section 2.4 for further discussion related to air quality construction impacts.

Avoidance, Minimization, and/or Mitigation Measures

The following project design features would be used to minimize operational air emissions:

- The project would preserve mature vegetation as a means of minimizing adverse air quality impacts to the maximum degree feasible. The project would be designed to minimize removal of existing trees, especially mature trees.
- Project design would allow consideration for maximizing vegetative plantings throughout urban areas.
- The project would plant disturbed areas with a variety of native and drought-tolerant trees and shrubs in ratios sufficient to replace the air quality and

cooling benefits of trees removed by construction of the project. Additional trees would be planted as space allows to further increase those benefits. Riparian planting would also be included to maintain shade along creek corridors.

- The project would seed slopes, drainage channels, and other disturbed areas with native and drought-tolerant shrubs, perennials and grasses.
- The project would incorporate recycling and waste diversion techniques by promoting the reuse of materials such as steel, road base, concrete, asphalt-concrete, etc. to the extent feasible (Deputy Directive 17 *Recycling Asphalt Concrete*).
- Measures would be included that propose to conserve energy and nonrenewable resources, include removing and reusing existing thrie-beam barrier, wherever possible. Also, when possible, guide signs within the project limits would be reset.

Climate Change

Climate change is analyzed in Chapter 3.

Neither the U.S. Environmental Protection Agency nor the Federal Highway Administration has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. As stated on the Federal Highway Administration'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 will aid decision-making and improve efficiency at the program level, and will 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 on climate change, the issue is addressed in Chapter 3, the California Environmental Quality Act (CEQA) chapter of this environmental document and may be used to inform the National Environmental Policy Act (NEPA) decision. The four strategies set forth by the Federal Highway Administration to lessen climate change

impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

2.2.7 Noise

Regulatory Setting

The National Environmental Policy Act of 1969 and the California Environmental Quality Act 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 the California Environmental Quality Act and the National Environmental Policy Act.

California Environmental Quality Act

The California Environmental Quality Act 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 the California Environmental Quality Act, then the act dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section focuses on the National Environmental Policy Act—23 Code of Federal Regulations 772 noise analysis. See Chapter 3 of this document for further information on noise analysis under the California Environmental Quality Act.

National Environmental Policy Act and 23 Code of Federal Regulations 772

For highway transportation projects with Federal Highway Administration (and the Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal Regulations 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 noise abatement criteria differ depending on the type of land use under analysis. For example, the noise abatement criterion for residences (67 dBA) is lower than the noise abatement criterion for commercial areas (72 dBA).