Air Quality Study Report

LINDEN AVENUE AND CASITAS PASS ROAD INTERCHANGES PROJECT

Casitas Pass Road to Linden Avenue

SB-101-PM 2.2/3.4

EA 05-4482U0

Approved by:

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Caltrans

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Executive Summary

This report documents the technical air quality study conducted for the Linden Avenue to Casitas Pass Road interchange improvement project on Route 101 in Carpinteria, Santa Barbara County. The proposed action includes reconstructing the Linden Avenue and Casitas Pass Road interchanges, reconfiguring on- and off-ramps, replacing Route 101 bridges over Carpinteria Creek, extending Via Real frontage road from Bailard Avenue through to Casitas Pass Road, adding a new bridge over Carpinteria Creek at Via Real, and reconstructing bike paths. The proposed action will take place on Route 101 and adjacent streets from west of Franklin Creek to just east of Carpinteria Creek. The project area is approximately one mile in length and located within the City of Carpinteria in Santa Barbara County.

This report is prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the state lead agency for CEQA compliance. The Federal Highway Administration (FHWA), with Caltrans serving as its representative, is the federal lead agency for NEPA compliance.

The air study provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The report provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies minimization measures recommended for potentially significant impacts where identified.

The project is located on a coastal terrace on the south-facing coast of southern Santa Barbara County. The area is bounded 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 area is exposed to strong, cool winds that often blow out of the southwest (prevailing "westerlies").

Semi-permanent high pressure that lies 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 broken up by a change in the weather pattern.

In Santa Barbara County, ozone and PM_{10} are the pollutants of main concern, since exceedances of state health-based standards for those are experienced here in most years. For this reason the County has been designated as a non-attainment area for the State PM_{10} and ozone standards for the past several years. In order for an air district to be in attainment with state ambient air quality standards, the state standards for any criteria pollutant must not be exceeded for three consecutive years.

Since the County of Santa Barbra is in attainment or maintenance of all national ambient air quality standards (NAAQS), all approved projects in the county have presumptive conformity to the State Implementation Plan (SIP). The project is listed in the 2007 Federal Transportation Improvement Program (FTIP) for Santa Barbara County.

The proposed project is not expected to have a significant adverse impact on long-term air quality. The County of Santa Barbara has included the project in their 2006 State Transportation Improvement Program (STIP). The project is an operational improvement that should help improve traffic circulation, a transportation control measure listed in the Santa Barbra County Air Pollution Control District (SBCAPCD) Clean Air Plan (CAP) that is the applicable SIP for Santa Barbara County. These improvements are expected to have no net effect on average speeds on the route, and would have a beneficial impact on air quality by relieving some of the congestion on the through lanes of the highway. Two pollutants of concern, carbon monoxide (CO) and reactive organic gas (ROG) decrease with increasing speeds.

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1. Purpose of Air Quality Study Report

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), City of Carpinteria, and Santa Barbara County Association of Governments (SBCAG) are proposing to improve circulation on local streets by extending the Via Real frontage road and reconstructing the Casitas Pass Road and Linden Avenue interchanges. The proposed improvements will not preclude a future widening of Route 101.

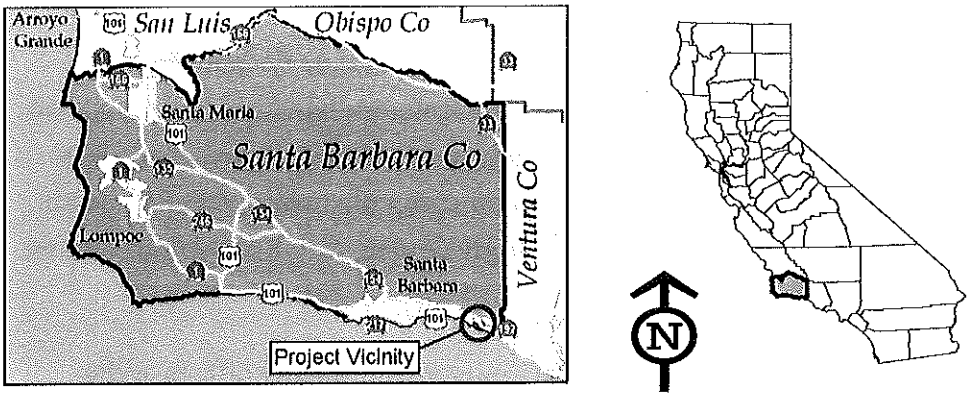
This report documents the potential short and long-term air quality effects of the proposed project. Because this document is intended to satisfy the requirements of both the California Environmental Quality Act and the National Environmental Policy Act, it addresses both state and federal air quality standards.

2. Project Location, Description, and Alternatives

Route 101 through Carpinteria is currently two lanes in each direction with a 40-foot median. The highway is bordered with a mix of commercial, residential, agricultural properties, and open space (refer to Figure 1).

In the past years, traffic has increased on this section of Route 101 and the local streets. Historically, this portion of Route 101 operated at Level of Service (LOS) A and B. Currently the freeway operates at LOS D to LOS F during the peak periods. Casitas Pass Road currently operates at LOS C with an average travel speed of 13 miles per hour (mph), and Linden Avenue at LOS D with an average travel speed of 7 mph. An increase in commercial traffic, commuter trips, motorists passing through the city, and tourists visiting local attractions account for this growth. The result has been heavy congestion during peak-hour traffic periods and higher volumes during the summer and holiday weekends. These conditions have been intensified on the local streets by nonstandard interchange elements and the lack of a continuous frontage road.

The project is required because this area (including local streets) is experiencing steadily increasing congestion. Application of the most current design standards will also improve traffic operations in this area. The improvements are funded through the HE-11 New Connections and Cross-Traffic Improvements Program.



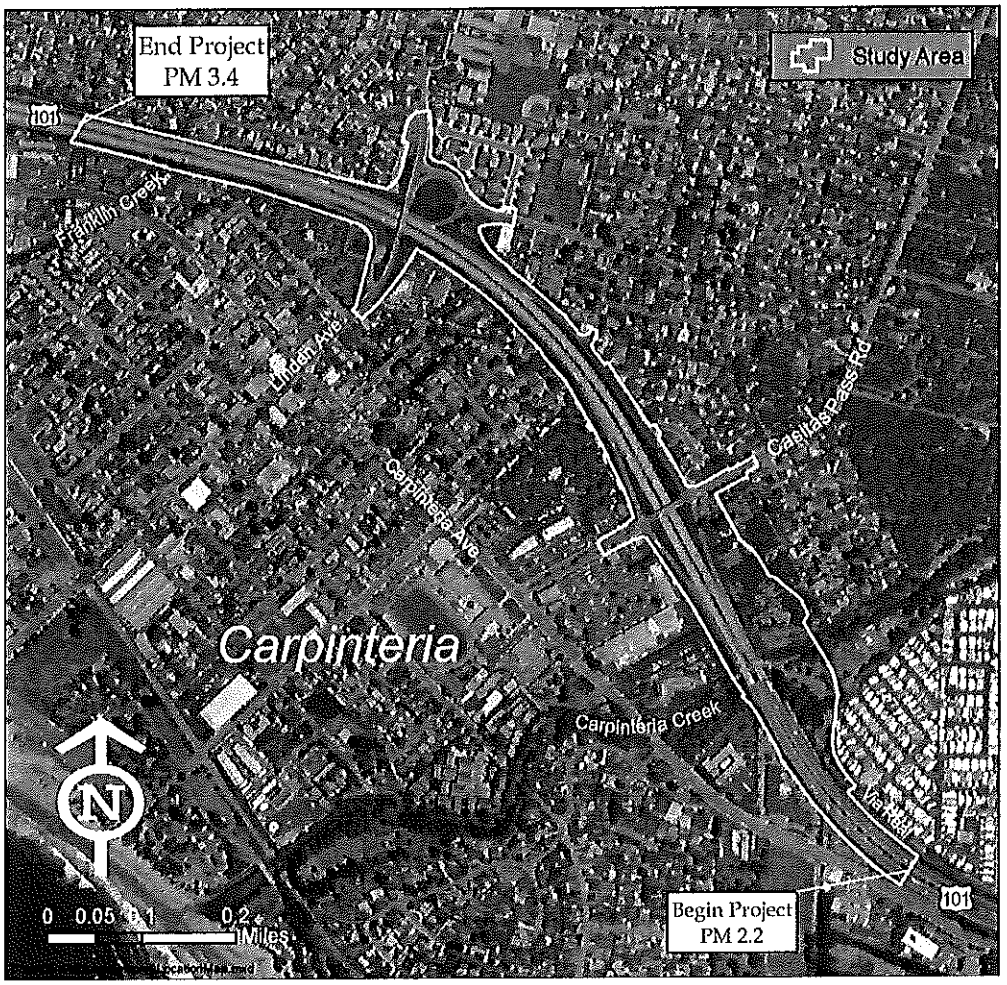


Figure 1—Project Location/Vicinity Map

Alternatives

Four alternatives are proposed for construction of the interchanges in addition to the No Build Alternative. Alternatives 1 and 4 would replace the northbound and southbound Franklin Creek Bridges in addition to the other improvements. Table 1 depicts the differences between the current build alternatives. Approximately 20 other alternatives have been considered and rejected over the life of the project. Another objective of the project is to reduce floodplain impacts from existing Route 101. Reduction of floodplain impacts would be accomplished by widening the existing northbound and southbound bridges over Carpinteria Creek (all alternatives) and northbound Franklin Creek (Alternatives 1 and 4), and by planning an adequate structure for the proposed extension of Via Real.

Table 1—Comparison Of Proposed Alternatives

DESCRIPTION	ALT. 1	ALT. 2	ALT. 3	ALT. 4
Replace existing 2-lane Casitas Pass Road overcrossing with 5-lane overcrossing, including bike lanes and 5-ft sidewalks	x	x	x	x
Upgrade southbound on and off-ramps at Casitas Pass Road OC	x	x	x	x
Construct new northbound on and off-ramps at Via Real south of Casitas Pass Road OC	x	x	x	x
Extend Via Real as a frontage road between mobile home park across Carpinteria Creek to Linden Avenue	x	x	x	x
Replace and widen northbound and southbound bridges on Route 101 over Carpinteria Creek	x	x	x	x
Construct new 2-lane bridge over Carpinteria Creek on Via Real	x	x	x	x
Remove northbound cloverleaf on-ramp at Linden Ave	x	x	x	x
Remove northbound on ramp at Vallecito Avenue	x	x	x	x
Replace existing 2-lane Linden Avenue overcrossing with 4-lane overcrossing including bike lanes and 5-ft sidewalks	-	x	x	-
Replace existing 2-lane Linden Avenue overcrossing with 5-lane overcrossing including bike lanes and 5-ft sidewalks	x	-	-	x
Replace northbound on-ramp and southbound off-ramp at Linden Avenue	x	x	x	x
Replace and widen northbound Franklin Creek Bridge	x	-	-	x
Signalize intersections at: Casitas Pass southbound on and off-ramp Casitas Pass northbound on and off-ramps at Via Real Casitas Pass Road/Via Real Linden Avenue/Via Real Linden Avenue northbound on-ramp Linden Avenue southbound off-ramp	x	x	x	x
Repave and raise the profile of Route 101 from the south project limit to just north of Casitas Pass Road overcrossing	x	x	x	x

No-Build Alternative

The no-build alternative would not alter the existing highway alignment. Therefore, local congestion would continue to worsen and the existing impediments to flow in Carpinteria (represented by the highway bridges) would continue to exist. Air quality impacts would not be considered to occur as a result of the no-build alternative.

3. Federal, State, and Local Regulations

The significance of a given pollutant can be evaluated by comparing its atmospheric concentration to State and Federal air quality standards, which are presented in Table 2. These standards represent allowable atmospheric contaminant concentrations at which the public health and welfare are protected, and include a factor of safety.

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the Clean Air Act, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six potential air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), suspended particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The State of California has developed the California Ambient Air Quality Standards (CAAQS). The Air Resources Board (ARB), which is part of the California EPA regulatory agency, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires that plans and strategies for attaining state ambient air quality standards as set forth in the California Clean Air Act (CCAA) of 1988 be developed throughout the state. The ARB also is responsible for developing motor emissions standards for California vehicles.

The California Clean Air Act requires all areas of the state to achieve and maintain the California ambient air quality standards by the earliest practicable date. These standards are generally more stringent than the Federal standards; thus, emission controls to comply with the State law are more stringent than necessary for attainment of the Federal standards (refer to Table 2). The CCAA requires that all APCD's adopt and enforce regulations to achieve and maintain the State ambient air quality standards for the area under its jurisdiction.

The project is located within the Santa Barbara County Air Pollution Control District (SBCAPCD), which administers air quality regulations developed at the federal, state, and local levels. These regulations are described below.

Pursuant to the requirements of the law, the SBCAPCD adopted a Clean Air Plan (CAP) for their jurisdiction. The *Final 2007 Santa Barbara County Clean Air Plan* has been approved by the SBCAPCD board to address attainment of national and state fugitive dust (PM_{10}) and Ozone (O_3) standards for the entire County (SBCAPCD 2007). The CAP is a comprehensive planning document intended to provide guidance to the APCD, the County, and other local agencies on how to attain and maintain the State standard for ozone and PM_{10}. The CAP presents a detailed description of the sources and pollutants which impact the jurisdiction, future air quality impacts to be expected under current growth trends, and an appropriate control strategy for reducing ozone precursor emissions, thereby improving air quality. The CAP is updated every three years to assess air quality trends and determine if additional measures are needed on a countywide basis to address regional impacts.

4. Air Quality Pollutants and Standards

On a regional basis, ozone is the pollutant of greatest concern in the County, particularly within the Santa Barbara coastal plateau. Ozone is a secondary pollutant, formed in the atmosphere by complex photochemical reactions involving precursor pollutants and sunlight. The amount of ozone formed is dependant upon both the ambient concentration of chemical precursors and the intensity and duration of sunlight. Consequently, ambient ozone concentration tends to vary seasonally with the weather. Reactive organic gases (ROG), also called reactive hydrocarbons (RHC), and nitrogen oxides (NO_X) are the primary precursors to ozone formation. NO_X emissions result primarily from the combustion of fossil fuels; ROG emissions are also generated by fossil fuel combustion and through the evaporation of petroleum products. Emissions of ROG and NO_X are fairly equally divided between mobile and stationary sources.

As stated, the federal and state governments have established ambient air quality standards for six criteria pollutants: carbon monoxide (CO), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb) (refer to Table 2). Ozone and PM are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and Pb are considered to be local pollutants because they tend to

accumulate in the air locally. PM is also considered as a local pollutant. In the area of the proposed project site, ozone and particulate matter are of particular concern.

A. **Carbon Monoxide (CO)**: Carbon monoxide is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 parts per million (ppm) by volume, and the federal 1-hour is 35 ppm. Both the state and federal standards are 9 ppm for the 8-hour averaging period. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light wind combine with ground-level temperature inversions. These conditions result in reduced dispersion of vehicle emissions. In addition, motor vehicles emit more CO in cool temperatures than in warm temperatures.

B. **Ozone (O_3):** Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include oxides of nitrogen and reactive organic gases, react in the atmosphere in the presence of sunlight to form ozone. State and federal standards for ozone have been set for a 1-hour averaging time. The state requires that ozone concentration not exceed 0.09 ppm of ozone being produced in a given area in 1 hour. The federal 1-hour ozone standard is 0.12 ppm, but it does not apply in California. The federal 8-hour ozone standard is 0.08 ppm and the state standard is .07 ppm.

C. **Particulate Matter (PM_{10}) & ($PM_{2.5}$)**: 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 NAAQS for particulate matter applies to two classes of particulate: particulate matter 2.5 microns or less in diameter ($PM_{2.5}$) and particulate matter 10 microns or less in diameter (PM_{10}). The state PM_{10} standards are 50 micrograms per cubic meter ($\mu g/m^3$) as a 24-hour average and 20 $\mu g/m^3$ as an annual arithmetic mean. The federal PM_{10} standards are 150 $\mu g/m^3$ as a 24-hour average. The federal standards for $PM_{2.5}$ are 15 $\mu g/m^3$ and 35 $\mu g/m^3$ for annual and 24 hours respectively. The state standard for $PM_{2.5}$ is 12 $\mu g/m^3$ as an annual arithmetic mean. There is no separate state standard for 24-hour $PM_{2.5}$.

D. **Nitrogen Dioxide (NO_2):** Nitrogen dioxide belongs to a family of highly reactive gases called nitrogen oxides (NOx). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A suffocating, brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in air to form corrosive nitric acid, as well as toxic organic nitrates. It also plays a major role in the atmospheric reactions that produce ground-level ozone (or smog). EPA's health-based national air quality standard for nitrogen dioxide is 0.053 ppm.

E. **Sulfur Dioxide (SO_2):** Sulfur dioxide belongs to the family of sulfur oxide gases (SOx). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes. EPA's health-based national air quality standard for sulfur dioxide is 0.030 ppm (measured on an annual average) and 0.14 ppm (measured over 24 hours).

F. **Lead (Pb):** Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Table 2—Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Concentrations	
		State Standards (CAAQS)	Federal Standards (NAAQS)
Ozone	8 hour	0.07 ppm (137 $\mu g/m^3$)	0.08 ppm (157 $\mu g/m^3$)
	1 hour	0.09 ppm (180 $\mu g/m^3$)	NA
Carbon Monoxide	8 hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide	Annual arithmetic mean	NA	0.053 ppm (100 $\mu g/m^3$)
	1 hour	0.25 ppm (470 $\mu g/m^3$)	NA
Sulfur Dioxide	Annual arithmetic mean	NA	0.03 ppm (80 $\mu g/m^3$)
	24 hour	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (365 $\mu g/m^3$)
	1 hour	0.25 ppm (655 $\mu g/m^3$)	NA
Particulate Matter (PM_{10})	Annual arithmetic mean	20 $\mu g/m^3$	NA
	24 hour	50 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter – fine ($PM_{2.5}$)	Annual arithmetic mean	12 $\mu g/m^3$	15 $\mu g/m^3$
	24 hour	No separate state standard	35 $\mu g/m^3$
Sulfates	24 hour	25 $\mu g/m^3$	NA
Lead	Calendar quarter	NA	1.5 $\mu g/m^3$
	30-day average	1.5 $\mu g/m^3$	NA
Hydrogen Sulfide	1 hour	0.03 ppm (42 $\mu g/m^3$)	NA
Vinyl Chloride (chloroethene)	24 hour	0.01 ppm (26 $\mu g/m^3$)	NA
Visibility-Reducing Particles	8 hour (10:00 a.m. to 6:00 p.m. Pacific Standard Time)	Extinction coefficient of 0.23 kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	NA

Source: California Air Resources Board (11/10/06) and Environmental Protection Agency (10/13/06)
mg/m^3=milligrams per cubic meter; NA=no standard implemented; ppm=part per million; $\mu g/m^3$=micrograms per cubic meter

5. Air Quality Conformity

The 1990 Federal Clean Air Act Amendments (CAAA), promulgated November 15, 1990, placed tough new requirements on sources and causes of air pollution in areas failing to meet federal air quality standards. The CAAA require substantial reduction from all pollution sources, including pollutants from the transportation sector. The CAAA included more stringent requirements for demonstrating that transportation plans and projects contributed to improvement in air quality contained in the conformity provisions in section 176(a). On Nov 15, 1993, the EPA published a

conformity rule delineating specific criteria and procedures for fulfilling the conformity requirements of the CAAA. This rule was recently updated and published in the Federal Register August 15, 1997. It became effective September 15, 1997.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) made a number of revisions to the Clean Air Act's transportation conformity provisions. In particular, SAFETEA-LU made the following changes:

1. Changes 18-month trigger to two years for re-determination of conformity after certain air quality planning actions.
2. Changes frequency of conformity for plans and Transportation Improvement Programs (TIPs) from every 3 years to every 4 years.
3. Provides option for Metropolitan Planning Organizations (MPOs) to shorten the time horizon for conformity determination.
4. Allows Transportation Conformity Measures (TCMs) to be substituted or to be added to existing TCMs without a State Implementation Plan (SIP) mechanism.
5. Provides a 12-month grace period before a lapse occurs after an applicable deadline is missed.
6. Limits Conformity SIPs to interagency consultation and enforcement provisions.

SAFETEA-LU requires EPA to revise the Transportation Conformity Rule by August 10, 2007, two years after the enactment of SAFETEA-LU.

6. Transportation Conformity

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.

The federal Clean Air Act requires that all transportation plans and programs pass the air quality conformity test. This process involves forecasting future emissions of air pollution to determine whether the amount of future pollution resulting from the plan or program would be within the allowable limit for motor vehicle emissions.

Transportation conformity must be determined for all nonattainment area pollutants classified as regional pollutants. In the South Central Coast Air Basin, those pollutants are ozone and particulate matter for CAAQS. Transportation projects also

generate CO, which is considered a localized pollutant. CO micro-scale modeling is required to determine whether a transportation project would cause or contribute to localized violations of CO NAAQS.

Regional conformity must be determined based on a full study at least every 3 years. In California, it is determined at least every 2 years when the state-required Regional Transportation Plan (RTP) updates are done. In addition, a new federal TIP is required every 2 years, for which a conformity determination is required. Amendments to both the RTP and TIP between mandated conformity analysis also must have conformity demonstrated, including a full-scale revision of the regional analysis if regionally significant projects are added, deleted, or significantly modified.

Regional conformity is demonstrated by showing that the project is included in a conforming RTP and TIP with substantially the same design concept and scope that was used for the regional conformity analysis.

Project level conformity is demonstrated by showing that the project will not exceed CO and/or PM_{10} standards, and that it will not interfere with timely implementation of Transportation Control Measures called out in the State Implementation Plan.

The Final Rule has the following key elements:

- This rule requires that $PM_{2.5}$ hot spot analyses be performed only for new transportation projects with significant diesel traffic. Examples of such "projects of air quality concern" include inter-modal freight or bus terminals, and major highway projects and congested intersections involving significant diesel traffic. No hot spot analyses will be required for most projects in $PM_{2.5}$ areas, because most projects are not an air quality concern. This final rule also streamlines existing PM_{10} hot spot requirements in a similar way.
- The streamlined approach in this final rule will ensure that transportation and air quality agencies in $PM_{2.5}$ and PM_{10} areas use their resources efficiently, while achieving clean air goals.
- In both $PM_{2.5}$ and PM_{10} areas, a quantitative hot spot analysis is not required until EPA issues a new motor vehicles emissions model capable of estimating local emissions as well as future hot spot modeling guidance. Qualitative analyses will apply in the interim.
- This rule extends an existing flexibility by allowing the U.S. Department of Transportation to make "categorical hot spot findings," which waive $PM_{2.5}$ and

PM_{10} hot spot reviews for categories of projects where modeling shows that there is no air quality concern.

7. Regional Climate and Topography

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

Topography

The project is located on a coastal terrace on the south-facing coast of southern Santa Barbara County. The area is bounded 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 to the north is about 4.5 miles. Further to the north are the San Rafael Mountains with elevations up to 6800 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 that lies 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 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 situation where pollutants are swept offshore at night and subsequently carried back onshore during the day. This effect is exacerbated during periods when wind speeds are low.

The terrain around Point Conception, combined with the change in orientation of the coastline from north-south to east-west can cause counterclockwise circulation (eddies) to form east of the Point. These eddies fluctuate temporally and spatially, often leading to highly variable winds along the southern coastal strip. Point Conception also marks the change in the prevailing surface winds from northwesterly to southwesterly.

Santa Ana winds are northeasterly winds that occur primarily during fall and winter, but occasionally in spring. These are warm, dry winds blown from the high inland desert that descend down the slopes of a mountain range. Wind speeds associated with Santa Ana's are generally 15-20 mph, though they can sometimes reach speeds in excess of 60 mph. 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 (measured at Vandenberg Air Force Base once each morning and afternoon) 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 they 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 (0-500 ft) are most frequent during the winter, and subsidence inversions (1000-2000 ft) are most frequent during the summer. Inversions are an increase in temperature with height and are directly related to the stability of the atmosphere. Inversions act as a cap to the pollutants that are emitted below or within them and ozone concentrations are often higher directly below the base of elevated inversions than they are at the earth's surface. For this reason, elevated monitoring sites will occasionally record higher ozone concentrations than sites at lower elevations. Generally, the lower the inversion base height and the greater the rate of temperature increase from the base to the top, the more pronounced effect the inversion will have on inhibiting vertical dispersion. The subsidence

inversion is very common during summer along the California coast, and is one of the principal causes of air stagnation.

Poor air quality is usually associated with air stagnation (high stability/restricted air movement). Therefore, it is reasonable to expect a higher frequency of pollution events 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.

8. Emissions Analyses

The Federal Highway Administration (FHWA) and Environmental Protection Agency (EPA) 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 changes in vertical/horizontal alignments. These kinds of projects are exempt from the requirement that an (air quality) conformity determination be made according to Title 40 CFR (Code of Federal Regulations) Section 93.126.

This project meets the above criteria. Since no additional lanes are being added to the highway, there will be no difference in long-term air quality emissions from the highway with or without the project. Since the project will not increase local concentrations of air pollutants, it is consistent with the state air quality goals of the SBCAPCD.

A. Regional Analysis

This project is exempt from regional (40 CFR 93.127-128) conformity requirements. Separate listing of the project in the Regional Transportation Plan and Transportation Improvement Program, and their regional conformity analyses, is not necessary. The project will not interfere with timely implementation of Transportation Control Measures identified in the applicable SIP and regional conformity analysis.

To be eligible for federal funding, projects must be found to conform to State Implementation Plan (SIP) guidelines. The proposed project is included in the 2006 State Transportation Improvement program (STIP), 2007 Federal Transportation Improvement Program (FTIP), and the 2007 Regional Transportation Plan (RTP) for

the County of Santa Barbara. Both the RTP and the FTIP are deemed consistent with the CAP.

The most recent federally approved SIP for the county is currently the 2001 Clean Air Plan (CAP)[1]. The 2001 CAP established an upper limit on vehicular emissions that the county can tolerate and still maintain the National Ambient Air Quality Standards (NAAQS) for ozone. In order for an RTP or FTIP to receive federal approval, the regional vehicular emissions resulting from the implementation of projects of the plan and program must be within these established emission limits. The project is included in the 2007 RTP and FTIP. These are in conformance with the SIP, however, since the project is in attainment with all NAAQS, a conformity determination is not required. The most recently approved CAP for attaining state AAQS is the 2007 CAP. This is the applicable SIP for state AAQS. Since the project is listed in the RTP it is deemed consistent with the SBAPCD local air quality goals as expressed in the 2007 CAP.

B. Project Level Analysis

The proposed project is not expected to have a significant adverse impact on long-term air quality. Santa Barbara County has included the project in their 2006 State Transportation Improvement Program (STIP). The project is an operational improvement that should help improve local traffic circulation, a transportation control measure listed in the SBCAPCD Clean Air Plan. The connection of Via Real to Linden Avenue will have a beneficial impact on air quality by relieving some of the congestion on the through lanes of the highway. Carbon monoxide (CO) and oxides of nitrogen (NO_x) decrease with increasing speeds.

All project alternatives would connect currently isolated segments of Via Real between south of Carpinteria Creek and Linden Avenue. This should relieve some congestion on the highway (up to 200 vehicles per hour in each direction) in the peak traffic hour. The project would not create any additional intersections, but it would modify, move, or reconfigure several existing ones. No additional CO hot-spots would be created, therefore, impacts on CO (carbon monoxide) are expected to be negligible. Carbon monoxide is a low speed emission that increases when vehicles idle for longer periods of time. Alternative 3 would replace the existing intersection at Via Real and Ogan Road with a roundabout that would not increase CO emissions. Table 3 lists the criteria pollutants of concern and their respective federal and state attainment statuses.

Table 3—Federal and State Attainment Status

Criteria Pollutant	Federal Standard (National Ambient Air Quality Standards)	Federal Attainment Status	State Standard	State Attainment Status
Carbon Monoxide (CO)	9.0 ppm* (10 mg/m^3) (8-hour)	Attainment/ unclassified	9 ppm (10 mg/m^3) (8-hour)	Attainment
Nitrogen Dioxide (NO_2)	0.053 ppm (100 µg/m^3) (Annual Arithmetic Mean)	Attainment/ unclassified	0.030 (56 µg/m^3) (Annual Arithmetic Mean)	Attainment
Ozone (O_3)	0.08 ppm (100 µg/m^3) (8-hour)	Attainment/ unclassified	0.070 (137 µg/m^3) (8-hour)	Non-attainment
Respirable particulate (PM_{10})	150 µg/m^3 (24-hour) --	Unclassified	50 µg/m^3 (24-hour) 20 µg/m^3 (Annual Arithmetic Mean)	Non-attainment
Fine particulate ($PM_{2.5}$)	15 µg/m^3 (Annual Arithmetic Mean)	Attainment/ unclassified	12 µg/m^3 (Annual Arithmetic Mean)	Attainment

*ppm=parts per million

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

The California Air Resources Board has studied the emissions of particulate matter from diesel engines, and has concluded that all diesel particulate emissions including those from heavy-duty trucks and construction equipment are potentially harmful. As with noise exposure, the closer one is to the source of the emissions, the more one is likely to be affected by those emissions. The greatest impacts generally occur to residents within 300 feet of the highway. Since the project would improve local circulation in the immediate area, allowing free-flowing movements with less vehicle queuing, the additional health risk posed by this project is not considered to be substantial.

Project Operation (Long-term) Emissions – Build Alternatives 1 Through 4

Long-term operational emissions associated with the proposed project are due exclusively to the operation of motor vehicles in the project vicinity. The proposed project will not directly add capacity to the highway and will improve local circulation, thereby reducing low-speed emissions. Traffic volumes on Route 101, after completion of the project, would be approximately the same as under no-build conditions. Local roads would distribute area traffic in a more efficient manner by decreasing out of direction travel. Therefore, there should be no significant change in local or regional air quality caused by the project.

Carbon Monoxide (CO) Analysis

The project is located in an attainment/unclassified area for all current federal AQ standards. The proposed project does not add new intersections or facilities that would create idling vehicle ques. Therefore, conformity requirements do not apply and emission modeling analysis does not apply.

Particulate Matter Analysis

The project is located in an attainment/unclassified area for all current federal AQ standards. Therefore, conformity requirements do not apply and emission modeling analysis does not apply. The project complies with PM-10 control measures, as applicable, in the PM-10 air quality plan.

Mobile Source Air Toxics

The project is in a suburban area of southwest Santa Barbara County. There is only one known sensitive land use (e.g. schools, medical centers and similar health care facilities, child care facilities, parks and/or playgrounds) in the vicinity (500 foot radius) of the proposed construction corridor. That use is Carpinteria Creek Park. (update made 10/2/08)

The Federal Highway Administration has developed an interim guideline on how mobile source air toxics (MSATs) should be addressed in NEPA documents for highway projects. FHWA has developed a tier approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

1. No analysis for exempt projects with no potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT

The proposed project has a low potential for meaningful MSAT effects, as it is exempt from regional emissions analysis according to Title 40, Section 93.127 of the Code of Federal Regulations, and will not affect the capacity of the adjacent highway.

This IS/EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this document. Due to these limitations, the following discussion is included in

accordance with California Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions and dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of

carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

Benzene is characterized as a known human carcinogen.

The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

1,3-butadiene is characterized as carcinogenic to humans by inhalation.

Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems[2]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and

[2] See http://www.fhwa.dot.gov/environment/airtoxic/#note1

measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions-if any-from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm[3]

For each alternative in this project, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the interchange facilitates new development that attracts trips that were not occurring in this area before. This increase in VMT means MSATs under the Build Alternatives would probably be higher than the No Build Alternative in the study area. There could also be localized differences in MSATs from indirect effects of the project such as associated access traffic, emissions of evaporative MSATs (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks, depending on the type and extent of development. On a regional scale, this emissions increase would be offset somewhat by reduced travel to other destinations.

Since the estimated vehicle miles traveled (VMT) under each of the Build Alternatives are the same, it is expected there would be no appreciable difference in overall MSAT emissions among the two Build Alternatives. For all Alternatives, emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future than they are today.

In sum, under the proposed Build Alternatives in the design year it is not expected that there would be higher MSAT emissions in the study area, relative to the No Build Alternative, since there will be no increased VMT. There could be slightly elevated but unquantifiable changes in MSATs to residents and others in a few localized areas where the distance to the highway decreases. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause

[3] http://www.fhwa.dot.gov/environment/airtoxic/020306guidapc.htm

substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

9. Short-Term Construction Impacts

During construction, the proposed project will generate air pollutants. The exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon monoxide, suspended particulate matter, and odors. However, the largest percentage of pollutants would be windblown dust generated during excavation, grading, hauling, and various other activities. The impacts of these activities would vary each day as construction progresses. Dust and odors at some residences very close to the right of way could cause occasional annoyance and complaints.

The project is expected to take approximately 3 years, (12 quarters) to complete. There will be a temporary increase in local air pollutant emissions during the construction period. There are six major sources for air pollutants on a construction project. These are Reactive Organic Gas (ROG) emissions from **asphalt use;** particulate matter (PM) from **grading**; Carbon Monoxide (CO), Reactive organic compounds (ROC), Oxides of Nitrogen (NOx), and PM emissions from **construction vehicles**. ROC and NOx combine in the presence of sunlight to form ozone. These pollutants can contribute to respiratory ailments.

Total Suspended Particulate matter (TSP) will be the major air pollutant generated. Of particular concern will be PM_{10} (particulate matter smaller than 10 microns in diameter). PM_{10} is about 65% of TSP, and is considered a health hazard that can lead to respiratory ailments, especially in the young and the elderly, who are more prone to respiratory ailments. The primary source of air pollutants will be from soil grading, and application of asphalt products, both from the activities themselves, and the vehicles that perform the operations.

While they have no quantitative construction emission thresholds, Santa Barbara County APCD has requested that construction (short-term) emissions be quantified for all construction projects that require surface disturbance[4]. The current estimate of total area that the project would disturb is approximately 29 to 30 acres depending on the alternative selected. Assuming a total of 30 acres and that all project grading is done in a 2-month period (44 days), approximately 0.68 acres per day would be

[4] Scope and Content of Air Quality Sections in Environmental Documents (SBCAPCD, August 2007)

disturbed. Assuming 10.25 pounds of PM_{10} per acre per day[5] average, average daily emissions of PM_{10} would be 10.25 x .68 = 7 pounds per day.

Implementation of daily watering of all areas disturbed by construction activity will reduce this amount by 50%. Daily watering is required by Caltrans Standard Specifications.

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 approximately 7 miles to the northeast of the project area on the north side of the Santa Ynez Mountain Range. Therefore, discovery of naturally occurring asbestos (NOA) during project construction would be unlikely. The project hazardous waste report does not identify any potential impacts from NOA on this project

Asbestos Containing Materials (ACM)

At least four bridges (the northbound and southbound bridges over Carpinteria Creek, Linden Avenue and Casitas Pass) would be demolished and replaced with the proposed project. Because of the potential for older bridges to contain asbestos, a National Elimination System for Hazardous Air Pollutants (NESHAP) notification is required prior to demolition. This notification is given to the local Air Pollution Control District by the construction Contractor. The required inspection of these bridges was done in 2001. No asbestos containing materials were found. If Alternative 1 or 4 is selected, the northbound and southbound Franklin Creek bridges will require inspection, and will be included in the NESHAP notification.

Avoidance, Minimization, and/or Mitigation Measures

Caltrans Standard Specifications pertaining to dust control and dust palliative requirement is a required part of all construction contracts and should effectively reduce and control emission impacts during construction. The provisions of Caltrans Standard Specifications, Section 7-1.0F (Air Pollution Control) and Section 10 (Dust Control) require the contractor to comply with SBCAPCD rules, ordinances, and regulations. These requirements include daily watering of all areas disturbed by

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construction activities. State Health and Safety Code requires the contractor to prevent visible dust from leaving the construction site.

The following measures will be included with the Resident Engineer's (RE's) Instructions. Applicable measures from this list shall be used, at the RE's discretion, to further minimize emissions of particulate matter when standard dust control methods from Caltrans Standard Specifications are ineffective at minimizing fugitive dust from the project. The Resident Engineer will determine applicability of these dust control measures to the project. This list includes all PM_{10} reduction measures recommended by SBCAPCD in their *"Scope and Content of Air Quality Sections in Environmental Documents."*

AQ-1 Fugitive PM_{10} Management Measures Techniques (employ as applicable)

a) Reduce the amount of disturbed area where possible.
b) Use water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency would be required whenever wind speeds exceed 15 miles per hour. Reclaimed (i.e., non-potable) water should be used whenever possible.
c) All dirt stockpile areas should be sprayed daily as needed.
d) Permanent dust control measures identified in the approved re-vegetation and landscape plans should be implemented as soon as possible following completion of any soil-disturbing activities.
e) Exposed ground areas that would be reworked more than one month after initial grading should be sown with a fast-germinating native grass seed and watered until vegetation is established.
f) All disturbed soil areas not subject to re-vegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the Santa Barbara Air Pollution Control District.
g) All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading, unless seeds or soil binders are used.
h) Vehicle speed for all construction vehicles should not exceed 15 miles per hour on any unpaved surface at the construction site.
i) All trucks hauling dirt, sand, or other loose materials are to be covered or should maintain at least 2-feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code Section 23114.

j) Wheel washers should be installed where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site.

k) Streets should be swept at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible.

l) The Contractor or builder should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties would include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons would be provided to the SBCAPCD prior to land use clearance for map recordation and land use clearance for finish grading of the structure.

AQ-2 Standard Minimization Measures for Construction Equipment

a) Maintain all construction equipment in proper tune according to manufacturer's specifications.

b) Fuel all off-road and portable diesel-powered equipment including, but not limited to, bulldozers, graders, cranes, loaders, scrapers, backhoes, generator sets, compressors, and auxiliary power units, with motor diesel fuel certified by the California Air Resources Board (non-taxed version suitable for off-road).

c) Maximize, to the extent feasible, the use of diesel construction equipment meeting the California Air Resources Board's 1996 or newer certification standard for off-road heavy-duty diesel engines.

AQ-3 Discretionary Minimization Measures for Construction Equipment

a) Electrify equipment where feasible.

b) Substitute gasoline-powered for diesel-powered equipment, where feasible.

c) Use alternatively fueled construction equipment onsite, where feasible, such as compressed natural gas, liquefied natural gas, propane, or bio-diesel.

AQ-4 Discretionary Activity Management Techniques

a) Develop a comprehensive activity management plan designed to minimize the amount of large construction equipment operating in any given time period.

b) Schedule construction truck trips during non-peak hours to reduce peak hour emissions.

c) Limit the length of the construction workday, if necessary.

d) Phase construction activities, if appropriate.

10. References

California Department of Transportation. 2007. Air Quality Report Template. March

California Air Resources Board. 2007. http://www.arb.ca.gov/desig/adm/adm.htm

Dibblee, Thomas Jr. 1986. *Geologic Map of the Carpinteria Quadrangle, Santa Barbara County, California.*

Federal Highway Administration. 2007.
http://www.fhwa.dot.gov/environment/airtoxic/020306guidapc.htm

Santa Barbara County. 2007, 2004, 2001. "*Clean Air Plan*"

_____. 2002. Scope and Content of Air Quality Sections in Environmental Documents. December

Appendices

Emission modeling was not performed for this analysis. No appendices have been included.