

AIR QUALITY ANALYSIS

STATE ROUTE 74

LOWER ORTEGA HIGHWAY WIDENING

12-ORA-074 PM 1.0/1.9

EA# 086900

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1.0 EXECUTIVE SUMMARY

The Department of Transportation (Caltrans) proposes to widen State Route 74 (SR-74) from two lanes to four lanes from Calle Entradero to the City of San Juan Capistrano/County of Orange limits. The total length of the project is approximately 0.9 miles (mi). The alignment of the existing roadway imposes driving restrictions such as limited sight distance and difficulties in negotiating sharp curves.

This air quality analysis provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The analysis provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies mitigation measures.

Historical air quality data show that existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either the State or federal ambient air quality standards. The proposed project will help to improve traffic flow and reduce congestion on roadway links in the project vicinity. Using the Department's Transportation Project-Level Carbon Monoxide Protocol, a CO hot-spot analysis was conducted to determine whether the proposed project would result in any CO hot spots. It was determined that the proposed project will not result in any exceedances of the one-hour or eight-hour CO standards.

Compliance with South Coast Air Quality Management District (SCAQMD) Rules and Regulations during construction will reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. Because the highway improvement project does not generate new regional vehicular trips, no new regional vehicular emissions would occur. The proposed project may have a beneficial effect in helping to reduce congestion on roadway links in the project vicinity.

The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. Therefore, the impact from naturally occurring asbestos (NOA) during project construction would be minimal to none.

2.0 INTRODUCTION

The State of California Department of Transportation (Caltrans) proposes to widen State Route 74 (SR-74) from two lanes to four lanes from Calle Entradero to the City of San Juan Capistrano (City)/ County of Orange limits (eastern City limit). The total length of the project is approximately 0.9 mile (mi). The alignment of the existing roadway imposes driving restrictions such as limited sight distance and difficulties in negotiating sharp curves. The regional location of the project and the project vicinity are shown in Figure 1.

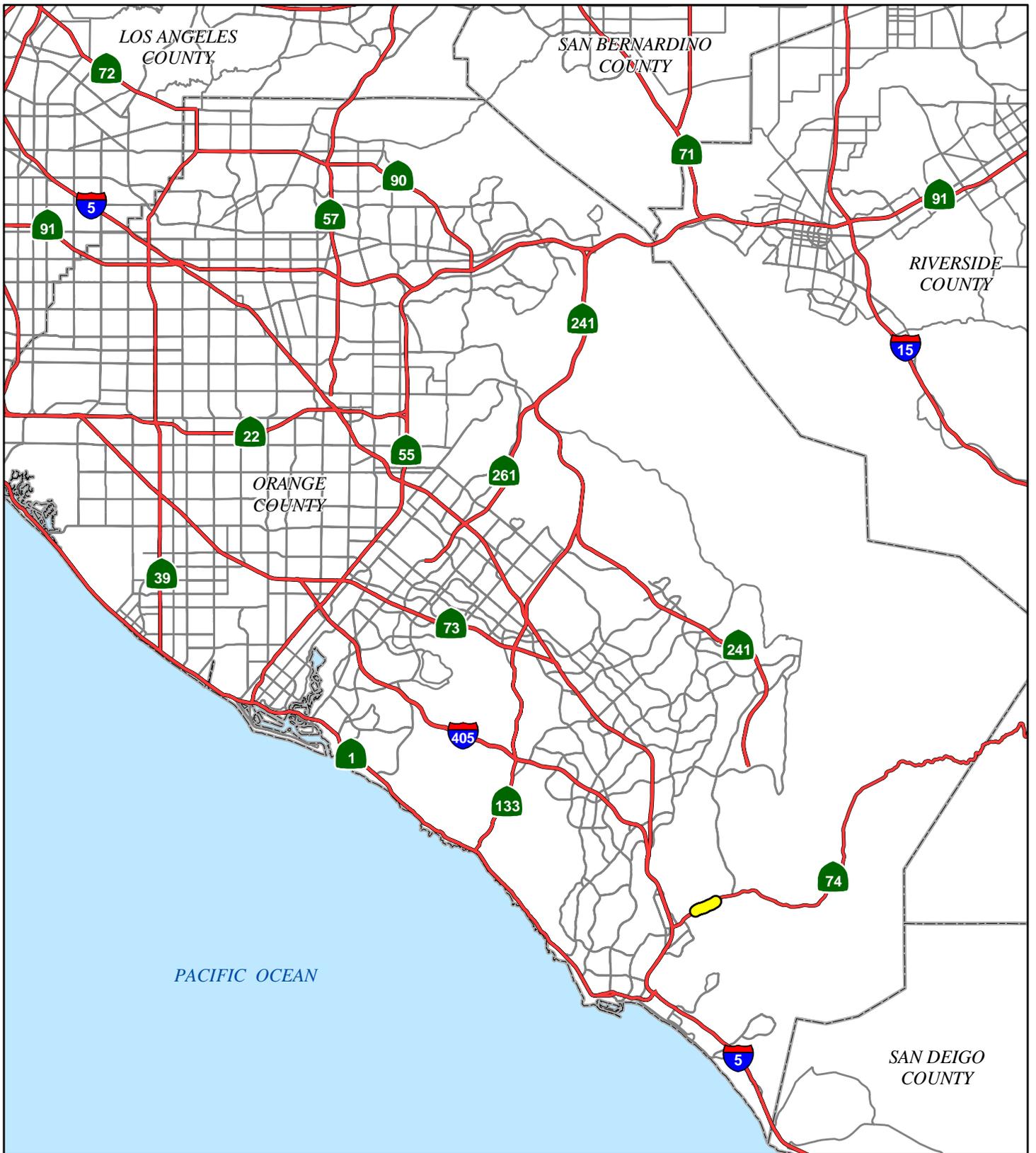


FIGURE 1



 Project Study Area

0 2.5 5 Miles


SOURCE: Thomas Bros. (2007).
 I:\CDT0802\GIS\Fig_1.mxd (5/16/2008)

Lower SR-74 Widening Project
Regional Location Map
 12-ORA-74 PM 1.0/1.9 (KP 1.7/3.0)
 EA# 086920

3.0 PROJECT DESCRIPTION

The proposed project will widen SR-74 by adding one through lane in each direction, east and west bound from PM 1.0 to PM 1.9, the City/County line. The alternatives are Alternative 1, Northside widening, Alternative 2, Northside widening with sidewalk addition, and the No-Build Alternative.

BUILD ALTERNATIVES

The following project features are common design elements for both of the Build Alternatives: Currently, there are two 12-ft lanes in each direction and no median throughout the project area. The Build Alternatives would provide one additional 12-ft wide lane in each direction, as well as a 12-ft wide painted median. A 5-ft-wide paved shoulder would be provided on each side of the roadway to accommodate Class II (striped on-road) bicycle facilities, except from Avenida Siega to the City/County limits where it would transition to an 8-ft-wide shoulder to merge with the County portion of the project. The edge of the pavement would have concrete curbs on each side of the roadway.

[Verify with Caltrans] The proposed additional lanes, shoulders, median, drainages, driveways, and sidewalk have been developed consistent with the standards in the Caltrans' Highway Design Manual.

Intersection Improvements

There are five roadways that intersect with SR-74 from the south within the Project Limits: Calle Entradero, Via Cordova, Via Cristal, Via Errecarte, and Avenida Siega. North of SR-74, Via Cordova becomes Hunt Club Drive, and Avenida Siega becomes Shade Tree Lane. Additionally, to the north, Palm Hill Drive and Toyon Drive provide access to private property. Each intersection would be modified/widened to accommodate the additional lanes, median, and shoulders. At intersections where there are existing right-turn pockets (Via Cordova and Via Cristal), the right-turn pocket would remain. No new intersections are proposed. No existing intersections are proposed to be signalized. A traffic study was prepared by Austin-Foust Associates, Inc. for the proposed project (April 2008). None of the intersections met the signal criteria set forth in the 2006 Manual on Uniform Traffic Control Devices (MUTCD) and therefore none of the intersections warrant a signalized intersection.

Driveways

On the north side of SR-74 within the Project Limits, there are 11 existing driveways. Each of the 11 driveways would be modified to meet the grade of the widened roadway and to include reconstruction of the curb return. These driveways would be designed and built to Caltrans standards in order to maintain sight distance and to avoid safety issues. Along the south side east of the Project Limits, there are currently two paved driveways. These would be paved and modified to be compliant with the Americans with Disabilities Act (ADA). No new driveways are proposed.

The parcel on the north side of SR-74 with the existing unpaved driveway located east of Shade Tree Lane and approximately 300 ft west of the City/County limits was subdivided according to a parcel map recorded on August 29, 1979, in the Office of the Orange County Recorder. The vehicular access rights for these parcels, which abut SR-74, were offered for relinquishment and were accepted by the City. The parcel map also created legal access for those parcels [**Caltrans, parcel or parcels?**] to SR-74 through Shade Tree Lane. Alternatives 1 and 2 would construct a retaining wall that would prevent access to SR-74 at this location.

Pedestrian and Bicycle Facilities

The existing sidewalk on the south side of SR-74 would be maintained in its current location with the exception of a portion of sidewalk at the intersection of Via Cordova, where the sidewalk would be shifted to the south and reconstructed to provide for the right-turn pocket at this intersection. A new sidewalk would be constructed to the east beyond Avenida Siega and would connect to the County sidewalk system to provide continuity.

Class II bicycle facilities are planned and would be provided on each side of the roadway as part of the five-ft-wide paved shoulders throughout the Project Limits. These facilities would be in conformance with the Orange County Transportation Authority (OCTA) Commuters Bikeways Strategic Plan (CBSP). The City's General Plan states in its Circulation Element that there is the need to promote an extensive public bicycle, pedestrian, and equestrian trails network. These bicycle facilities would comply with the City's goals.

Signals and Lighting

Currently, there are no traffic signals within the project limits. This project does not warrant any signals at the existing intersections (see Intersection Improvements above for details). However, in the future should there be a need for a signal/pedestrian crossing, the current design does not preclude the opportunity to install a signal. All streetlights affected by the widening of SR-74 would be relocated and replaced in kind.

BUILD ALTERNATIVE 1 SPECIFIC PROJECT FEATURES

Highway Widening

Build Alternative 1 would be constructed on both the north and south sides of SR-74, but primarily on the north side, to minimize removal of mature trees and the existing sidewalk on the south side of SR-74. This alternative would result in the roadbed changing from the current varying width of 62.3 ft at Calle Entradero and 24.6 ft [**Caltrans, this seems too narrow. Please verify width.**] at the City/County Line to a width varying from 70 ft to 76 ft including lanes, shoulders, and median.

In order to minimize impacts to the existing City parkway and equestrian trail from Alternative 1, Caltrans and the City decided to eliminate the sidewalk on the north side of the street from Calle Entradero to Palm Hill Drive, a length of 1,369 ft of sidewalk.

BUILD ALTERNATIVE 2 SPECIFIC PROJECT FEATURES

Highway Widening

Build Alternative 2 would widen SR-74 primarily on the north side, to minimize removal of mature trees and to avoid removal of the existing sidewalk on the south side of SR-74. This alternative would result in the roadbed changing from the current varying width of 62.3 ft at Calle Entradero and 24.6 ft [Caltrans, verify width, seems narrow] at the City/County Line to a width varying from 78 ft to 79 ft [Caltrans to verify] including lanes, shoulders, and median. The sidewalk on the north side of SR-74 between Calle Entradero and Via Cordova would be reconstructed to the north of its existing location. The existing meandering sidewalk would be reconstructed as a straight sidewalk (not curvilinear) within the existing public right of way. A short retaining wall would be required at some locations along the existing limit of the public right of way, which is delineated by the south side edge of the existing equestrian trail. With this alternative, most, if not all trees within this section of the roadway would be removed as a part of the construction.

NO-BUILD ALTERNATIVE

The No-Build Alternative would not include any improvements to the project and would result in LOS E and LOS F operating conditions for the mainline. SR-74 traffic would flow at approximately 35 mph or below and result in significant delays. SR-74 would be maintained in its existing two-lane condition and would continue to be used by commuters, recreation traffic, and commercial trucks. This alternative is not consistent with regional and local transportation plans. This alternative does not meet the purpose and need of the project.

Construction for this project is expected to start in mid-2009 [Caltrans, verify date] and be completed in the winter of 2011. There would be no staging areas within the project limits. The entire construction of SR-74 (both City and County portions) would occur at the same time with the County being the lead. [Caltrans, verify that timing is still accurate.] The staging areas for the entire widening would be coordinated within the County limits.

4.0 SETTING

4.1 REGIONAL CLIMATE AND AIR QUALITY

A region's topographic features have a direct correlation with air pollution flow; therefore, they are used by the California Air Resources Board (ARB) to determine the boundary of air basins. A local air district is then formed for each air basin; the district is responsible for providing air quality strategies to bring the air basin into compliance with the National Ambient Air Quality Standards (NAAQS).

The project site is located in Orange County, an area within the South Coast Air Basin (SCAB) that includes Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the SCAB is administered by SCAQMD, a regional agency created for the SCAB.

The SCAB climate is determined by its terrain and geographical location. The SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the SCAB. The region lies in the semipermanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the SCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit. With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site monitoring temperature is the Laguna Beach Station.¹ The annual average maximum temperature recorded at this station is 71.2EF, and the annual average minimum is 51.0EF. January is typically the coldest month in this area of the SCAB.

The majority of annual rainfall in the SCAB occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the SCAB along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Laguna Beach Station. Average rainfall measured at this station varied from 2.80 inches (in) in February to 0.49 in or less between May and October, with an average annual total of 12.71 in. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The SCAB experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer.

¹ Western Regional Climatic Center. 2008. <http://www.wrcc.dri.edu> (accessed April 9, 2008).

This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers are significant in determining ozone (O₃) formation. O₃ and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as CO. Particulate matter less than 10 microns in size (PM₁₀) is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and oxides of nitrogen (NO_x) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_x to form photochemical smog.

Air Pollution Constituents

Pursuant to the federal Clean Air Act (CAA) of 1970, the United States Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health. The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property).

The six criteria pollutants are O₃, CO, particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb). PM includes particulate matter less than 2.5 microns in diameter (PM_{2.5}) and particulate matter smaller than 10 microns in diameter (PM₁₀).

In April 2003, the EPA was cleared by the White House Office of Management & Budget (OMB) to implement the 8-hour ground-level O₃ standard. ARB provided the EPA with California's recommendations for 8-hour O₃ area designations on July 15, 2003. The recommendations and supporting data were an update to a report submitted to the EPA in July 2000. On December 3, 2003, the EPA published its proposed designations. EPA's proposal differs from the State's recommendations primarily on the appropriate boundaries for several nonattainment areas. ARB responded to the EPA's proposal on February 4, 2004. On April 15, 2004, EPA announced the new

nonattainment areas for the 8-hour O₃ standard. The designation and classification became effective on June 15, 2004. The Transportation Conformity requirement became effective on June 15, 2005.

The EPA proposed a PM_{2.5} implementation rule in September 2003 and made final designations in December 2004. The PM_{2.5} standard complements existing national and State ambient air quality standards that target the full range of inhalable PM₁₀.

These standards were addressed in the 2001 State Implementation Plan (SIP). The primary standards for these pollutants are shown in Table A, and the health effects from exposure to the criteria pollutants are described later in this section.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and state air quality regulating agencies. Data collected at permanent monitoring stations are used by the EPA to identify regions as “attainment” or “nonattainment,” depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The SCAB’s attainment status for each of the criteria pollutants is listed in Table B.

Ozone. O₃ (smog) is formed by photochemical reactions between NO_x and reactive organic gases (ROG) rather than being directly emitted. O₃ is a pungent, colorless gas typical of Southern California smog. Elevated O₃ concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, the elderly, and young children. O₃ levels peak during summer and early fall. Effective June 15, 2005, the EPA revoked in full the federal 1-hour O₃ ambient air quality standard, including associated designations and classifications, in all areas except 14 early action compacts all outside California. The entire SCAB is designated as a nonattainment area for the State 1-hour O₃ standard. The EPA has designated the status in the SCAB for the eight-hour O₃ standard as “Severe 17,” which means the SCAB has until 2021 to attain the federal eight-hour O₃ standard. The SCAQMD has requested that the Basin’s federal designation be changed from severe to extreme nonattainment. This change would extend the attainment deadline to 2023.

Table A: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²		
		Concentration ³	Method ⁴	Primary ^{2,5}	Secondary ^{3,6}	Method ⁷
Ozone (O ₃)	1-Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	No federal standard	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)		
Respirable Particulate Matter (PM ₁₀)	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 (PM _{2.5})	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 µg/m ³		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m ³)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	Nondispersive 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 (56 µg/m ³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (338 µg/m ³)		–		
Lead	30-day average	1.5 µg/m ³	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m ³	Same as Primary Standard	
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m ³)	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m ³)		0.14 ppm (365 µg/m ³)	–	
	3-Hour	–		–	0.5 ppm (1300 µg/m ³)	
	1-Hour	0.25 ppm (655 µg/m ³)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 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 ⁸	24-Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography			

Source: ARB, April 1, 2008.

See footnotes on next page.

Footnotes:

- ¹ California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter, PM₁₀; and visibility-reducing particles are values not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the 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 8-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 mg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the 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 25EC and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25EC 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 that 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 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.

Table B: Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O ₃ (1-hour)	Nonattainment	Revoked June 2005
O ₃ (8-hour)	Not established	Severe 17 Nonattainment ¹
PM ₁₀	Nonattainment	Serious Nonattainment ²
PM _{2.5}	Nonattainment	Nonattainment ³
CO	Attainment (except Los Angeles County)	Attainment/Maintenance
NO ₂	Attainment	Attainment/Maintenance
All others	Attainment/Unclassified	Attainment/Unclassified

Source: ARB 2008 (<http://www.arb.ca.gov/desig/desig.htm>).

Carbon Monoxide. CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. The entire SCAB is in attainment/maintenance for the federal and State CO attainment standards..

Nitrogen Oxides. NO₂, a reddish brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NO_x. NO_x is a primary component of the photochemical smog reaction. It also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition (i.e., acid rain). NO₂ decreases lung function and may reduce resistance to infection. The entire SCAB has not exceeded either federal or State standards for nitrogen dioxide in the past five years with published monitoring data. It is designated as a maintenance area under the federal standards and an attainment area under the State standards.

Sulfur Dioxide. SO₂ is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO₂ levels. SO₂ irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight. The entire SCAB is in attainment with both federal and State SO₂ standards.

Reactive Organic Compounds. Reactive organic compounds (ROC) are formed from combustion of fuels and evaporation of organic solvents. ROC is a prime component of the photochemical smog

¹ The SCAQMD has requested that the federal 8-hour O₃ attainment status be changed to extreme with an attainment date of 2023.

² In October 2006, the EPA, in its final rule revision, eliminated the annual PM₁₀ standard.

³ The PM_{2.5} nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 PM_{2.5} new standard of 35 µg/m³ applies one year after the effective date of the new designation (April 2010).

reaction. Consequently, ROC accumulates in the atmosphere much quicker during the winter, when sunlight is limited and photochemical reactions are slower.

Particulate Matter. Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (all particles less than or equal to 10 micrometers in diameter, or PM_{10}) derive from a variety of sources, including windblown dust and grinding operations. Fuel combustion and resultant exhaust from power plants and diesel buses and trucks are primarily responsible for fine particle (less than 2.5 microns in diameter, or $PM_{2.5}$) levels. Fine particles can also be formed in the atmosphere through chemical reactions. Coarse particles (PM_{10}) can accumulate in the respiratory system and aggravate health problems such as asthma. The EPA's scientific review concluded that fine particles ($PM_{2.5}$), which penetrate deeply into the lungs, are more likely than coarse particles to contribute to the health effects listed in a number of recently published community epidemiological studies at concentrations that extend well below those allowed by the current PM_{10} standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms. The entire SCAB is a nonattainment area for the federal and State PM_{10} standards. The attainment status of $PM_{2.5}$ in the SCAB was officially established by the EPA and ARB as nonattainment in December 2004 and July 2005, respectively. The $PM_{2.5}$ nonattainment designation is effective from April 5, 2005, and the conformity determination requirements effective from April 5, 2006. In the 2007 AQMP, the SCAQMD anticipated that the Basin will be in attainment for the $PM_{2.5}$ annual average federal air quality standard by the April 5, 2015, deadline.

Lead. Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the bloodstream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The entire SCAB is in attainment for federal and State lead standards.

Climate Change

While climate change has been a concern since at least 1988 as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas¹ (GHG) emissions reduction and climate change research and policy has increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the State level. AB 1493 requires the ARB to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

¹ Greenhouse gases related to human activity include: carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23, HFC-134a*, and HFC-152a*.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05. The goal of this EO is to reduce California's GHG emissions to: (1) 2000 levels by 2010, (2) 1990 levels by 2020, and (3) by the year 2050 to reduce GHG emissions to 80 percent below the 1990 levels. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." EO S-17-06 further directs State agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Climate change and GHG emissions reduction are also concerns at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reduction and climate change.

According to the IPCC report, *Climate Change 2007: The Physical Science Basis: Summary for Policymakers* (February 2007), there is no doubt that the climate system is warming. Global average air and ocean temperatures as well as global average sea level are rising. Of the last 12 years, 11 years have ranked as among the warmest on record since 1850. While some of the increase is explained by natural occurrences, the 2007 report asserts that the increase in temperatures is very likely (> 90 percent) due to human activity, most notably the burning of fossil fuels.

For California, similar effects are described in the California Climate Change Center report, *Our Changing Climate: Assessing the Risks to California* (July 2006). Based on projections using state-of-the-art climate modeling, the temperatures in California are expected to rise between 3°F to 10.5°F by the end of the century depending on how much California is able to reduce its GHG emissions. The report states that these temperature increases will negatively impact public health, water supply, agriculture, plant and animal species, and the coastline.

4.2 LOCAL AIR QUALITY

The SCAQMD, together with the ARB, maintains ambient air quality monitoring stations in the Basin. The air quality monitoring stations closest to the site are the Mission Viejo-26081 Via Pera Station and the Costa Mesa-Mesa Verde Drive Station. Their air quality trends are representative of the ambient air quality in the project area. Pollutants monitored at the Mission Viejo-Via Pera Station are CO, O₃, PM_{2.5}, and PM₁₀. Pollutants monitored at the Costa Mesa station are NO₂ and SO₂.

The ambient air quality data in Table C show that NO₂, SO₂, PM_{2.5} and CO levels are below the relevant State and federal standards. The State one-hour O₃ standard was exceeded 3 to 13 times per year in the last three years. The federal eight-hour O₃ standard was exceeded 1 to 6 times per year in the last three years. The State 24-hour PM₁₀ standard was exceeded one in 2006 but has not exceeded the federal 24-hour standard since 1999.

As previously mentioned, historical ambient air quality data are used to classify the attainment status for the SCAB. As a result of the nonattainment status, the region is required to prepare an Air Quality Attainment Plan (AQAP) for O₃, which consists of emission reduction strategies and implementation of these strategies. The implementation of the AQAP for the region is the responsibility of many agencies, including all of the local air districts, the SCAG, and the ARB.

Table C: Ambient Air Quality at the Mission Viejo-Via Pera Air Monitoring Station

Pollutant	Standard	2004	2005	2006
Carbon Monoxide				
Max 1-hr concentration (ppm)		2.4	2.2	1.9
No. days exceeded: State	> 20 ppm/1-hr	0	0	0
Federal	> 35 ppm/1-hr	0	0	0
Max 8-hr concentration (ppm)		1.5	1.6	1.6
No. days exceeded: State	9.0 ppm/8-hr	0	0	0
Federal	9 ppm/8-hr	0	0	0
Ozone				
Max 1-hr concentration (ppm)		0.116	0.125	0.123
No. days exceeded: State	> 0.09 ppm/1-hr	11	3	13
Max 8-hr concentration (ppm)		0.090	0.085	0.105
No. days exceeded: Federal	> 0.08 ppm/8-hr	4	1	6
Particulates (PM₁₀)				
Max 24-hr concentration ($\mu\text{g}/\text{m}^3$)		47.0	41.0	57.0
No. days exceeded: State	> 50 $\mu\text{g}/\text{m}^3/24\text{-hr}$	0	0	1
Federal	> 150 $\mu\text{g}/\text{m}^3/24\text{-hr}$	0	0	0
Annual Arithmetic Average ($\mu\text{g}/\text{m}^3$)		23.3	17.6	21.1
Exceeded: State	> 20 $\mu\text{g}/\text{m}^3$ ann. arth. avg.	Yes	No	Yes
Particulates (PM_{2.5})				
Max 24-hr concentration ($\mu\text{g}/\text{m}^3$)		49.4	35.3	46.9
No. days exceeded: Federal ¹	> 65 $\mu\text{g}/\text{m}^3/24\text{-hr}$	0	0	0
Annual Arithmetic Average ($\mu\text{g}/\text{m}^3$)		12.0	10.6	11.0
Exceeded: State	> 12 $\mu\text{g}/\text{m}^3$ ann. arth. avg.	No	No	No
Federal	> 15 $\mu\text{g}/\text{m}^3$ ann. arth. avg.	No	No	No
Nitrogen Dioxide²				
Max 1-hr concentration (ppm)		0.097	0.085	0.101
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0
Annual arithmetic average concentration (ppm)		0.016	0.014	0.015
Exceeded: Federal	> 0.053 ppm ann. arth. avg.	No	No	No
Sulfur Dioxide²				
Max 24-hr concentration (ppm)		0.008	0.008	0.005
No. days exceeded: State	> 0.04 ppm/24-hr	0	0	0
Federal	> 0.14 ppm/24-hr	0	0	0
Annual arithmetic average concentration (ppm)		0.002	0.001	0.001
Exceeded: Federal	> 0.030 ppm ann. arth. avg.	No	No	No

Sources: EPA and ARB, 2006.

ppm = parts per million

 $\mu\text{g}/\text{m}^3$ = microgram of pollutant per cubic meter of air

¹ The exceedances of the federal 24-hour PM_{2.5} standard are based on the old 65 $\mu\text{g}/\text{m}^3$ standard. In 2006, the EPA revised the standard to 35 $\mu\text{g}/\text{m}^3$

² Monitored at the Costa Mesa-Mesa Verde Drive Air Monitoring Station.

4.3 REGIONAL AIR QUALITY PLANS

The 1976 Lewis Air Quality Management Act established the SCAQMD and other air districts throughout the State. The federal Clean Air Act (CAA) Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

ARB coordinates and oversees both State and federal air pollution control programs in California. ARB oversees activities of local air quality management agencies and is responsible for incorporating air quality management plans for local air basins into a SIP for federal EPA approval. ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by ARB to classify air basins as “attainment” or “nonattainment” with respect to each pollutant and to monitor progress in attaining air quality standards. ARB has divided the State into 15 air basins. Significant authority for air quality control within the air basins has been given to local air districts that regulate stationary source emissions and develop local nonattainment plans.

The California Clean Air Act (CCAA) provides the SCAQMD with the authority to manage transportation activities at indirect sources and regulate stationary source emissions. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. An example of this would be the motor vehicles at an intersection, at a mall, and on highways. As a State agency, ARB regulates motor vehicles and fuels for their emissions.

The CAA requires that transportation plans and programs do not cause or contribute to any new violation of a standard, increase the frequency or severity of any existing violation, or delay the timely attainment of the air quality standards. The AQMP has developed Transportation Conformity Budgets to demonstrate that the on-road mobile sources will conform to the attainment demonstration contained in the SIP.

Regional Air Quality Management Plan

The SCAQMD and the SCAG are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the SCAB. Every 3 years the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to ARB for review and approval. The ARB approved a modified version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for O₃ and PM₁₀, replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future, and updates the maintenance plan for the federal NO₂ standard that the SCAB has met since 1992.

The 2003 AQMP proposes policies and measures to achieve federal and State standards for healthful air quality in the SCAB.

This revision to the AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories,

ambient measurements, new meteorological episodes, and new air quality modeling tools. This AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the O₃ SIP for the SCAB for the attainment of the federal O₃ air quality standard. However, this revision points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/1999 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the federal CAA.

The SCAQMD adopted the 2007 AQMP on June 1, 2007, which it describes as a regional and multiagency effort (i.e., the SCAQMD Governing Board, ARB, SCAG, and EPA). State and federal planning requirements will include developing control strategies, attainment demonstration, reasonable further progress, and maintenance plans. The 2007 AQMP also incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP includes a request to have the Basin's federal 8-hour O₃ attainment status changed from severe to extreme. This change would extend the attainment deadline from 2021 to 2023. The ARB approved the 2007 AQMP on September 27, 2007, and adopted it as part of the 2007 SIP. The ARB has forwarded the 2007 AQMP to the EPA for its review and approval.

4.4 METHODOLOGY

This air quality assessment includes estimating emissions associated with short-term construction and long-term operation of the proposed project. Long-term mobile emissions associated with the proposed project would be less than the no project scenario due to improved traffic flow in the project area, with the same projected future trips in the project vicinity. However, emissions reductions associated with such improvements are difficult to quantify. Therefore, no emissions calculations are provided in this analysis for regional vehicular emissions.

CO Hot Spots

Localized air quality impacts (i.e., CO concentrations [CO hot spots]) in the project area would be affected due to improved traffic flow from the ramp improvements. The Caltrans Transportation Project-Level Carbon Monoxide Protocol (December 1997) was used to assess the project's impact on the local CO concentrations. Table D shows the recorded CO levels in the project vicinity over the last three years.

Table D: CO Measurements (PPM) at the Mission Viejo/Via Pera AQ Station

Year	1-Hr		8-Hr			
	1st High	2nd High	1st High	2nd High	3rd High	4th High
2006	1.9	1.9	1.6	1.3	1.2	1.2
2005	2.2	2.2	1.6	1.6	1.4	1.3
2004	2.4	2.0	1.5	1.5	1.4	1.4
Federal Standards	35	35	9	9	9	9

Sources: <http://www.epa.gov/air/data/monvals.html>, <http://www.arb.ca.gov/adam/welcome.html>, April 2008.
ppm = parts per million

5.0 IMPACTS

Air pollutant emissions associated with the proposed project would occur over the short term from construction such as fugitive dust from grading/site preparation and equipment exhaust. Long-term emissions would improve from the enhanced traffic flow due to the highway improvements. The objective of the proposed project is to lessen traffic congestion and improve public safety. The highway improvement project is not expected to generate any additional traffic. Regional traffic trips would remain similar. Therefore, no new long-term regional emissions would result from implementation of the proposed project. The proposed project will improve traffic movement in the project vicinity, thereby lowering the total pollutants emitted by motor vehicles. The following section discusses the possible emissions-generating activities associated with the proposed project.

5.1 LONG-TERM MICROSCALE PROJECTIONS

CO Hot Spots

Caltrans has developed the Protocol (December 1997) for assessing CO impacts of transportation projects. The procedures and guidelines comply with the following regulations without imposing additional requirements: Section 176(c) of the 1990 CAA Amendments, federal conformity rules, State and local adoptions of the federal conformity rules, NEPA, and the CEQA requirements [California Code of Regulations Title 21 Section 1509.3(25)].

Two conformity-requirement decision flow charts are provided in the Protocol and also as Appendix A. An explanatory discussion of the steps (as identified in Figure 1 of the Protocol, Requirements for New Projects) used to determine the conformity requirements that apply to new projects is provided below.

3.1.1 Is the project exempt from all emissions analyses? (See Table 1 of Protocol.) **NO.** The project is not exempt from all emissions analyses.

3.1.2 Is the project exempt from regional emissions analysis? (See Table 2 of Protocol.) **NO.** The project will widen an existing highway. Therefore, it is not exempt from regional emissions analysis.

3.1.3 Is the project locally defined as regionally significant? **YES.** As mentioned above, the project will widen SR-74. Therefore, the project is potentially significant.

3.1.4 Is the project in a federal attainment area? **NO.** The project is located within a maintenance area for the federal CO standard.

3.1.5 Are there a currently conforming RTP and TIP? **YES.**

3.1.6 Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP? **YES**. The project is included in the SCAG 2004 RTP and the 2006 RTIP (Project ID: ORA120507, San Juan Capistrano – Ortega Highway Widen from 2 to 4 lanes; Calle Entradero to Antonio Parkway (lower Ortega)).

3.1.7 Has the project design concept and/or scope changed significantly from that in the regional analysis? **NO**.

3.1.9 Examine local impacts. (Proceed to Section 4.)

Section 4 of the Protocol assesses local analysis. Assessment of the project's effect on localized ambient air quality is based on analysis of CO and PM₁₀ emissions, with the focus on CO. Localized emissions of CO and PM₁₀ may increase with implementation of the project. CO is used as an indicator of a project's direct and indirect impact on local air quality because CO does not readily disperse in the local environment in cool weather when the wind is fairly still. As stated in the Protocol, the determination of project-level CO impacts should be carried out according to the Local Analysis flowchart shown in Figure 3 of the Protocol. The following discussion provides explanatory remarks for every step of the local analysis in Figure 3 of the Protocol.

Level 1: Is the project in a CO nonattainment area? **NO**. The project site is located in an area that has demonstrated attainment with the federal CO standard.

Level 1 (cont.): Was the area redesignated as "attainment" after the 1990 Clean Air Act? **YES**.

Level 1 (cont.): Has "continued attainment" been verified with the local Air District, if appropriate? **YES**. The basin was designated as attainment by the EPA on June 11, 2007. (Proceed to Level 7.)

Level 7: Does the project worsen air quality? **NO**. Because the following conditions (listed in Section 4.7.1 of the CO Protocol) are not met, the project would not potentially worsen air quality.

- a. *The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2% should be considered potentially significant.*

The percentage of vehicles operating in cold start mode is the same or lower for the intersection under study compared to those used for the intersection in the attainment plan. It is assumed that all vehicles in the intersection are in a fully warmed-up mode. Therefore, this criterion is not met.

- b. *The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5% should be considered potentially significant. Increasing the traffic volume by less than 5% may still be potentially significant if there is also a reduction in average speeds.*

Based on the Traffic Study (Austin-Foust Associates, Inc., April 2008), the proposed project would not increase the daily traffic volumes along SR-74. This is due to there being few

alternative routes within the project vicinity. As shown in Table E, the project would not increase the traffic volumes along SR-74. Therefore, this criterion is not met.

Table E: Peak-Hour Traffic Volumes

Roadway Link	A.M. Peak Hour	Change from No Build	P.M. Peak Hour	Change from No Build
South of La Nova	4148	0	3635	0
Between La Nova and Belford	3510	0	3505	0
Between Belford and Sundance	3477	0	3456	0
Between Sundance and Cuartel	3503	0	3462	0
Between Cuartel and Linda Vista	3475	0	3415	0
Between Linda Vista and Entradero	3466	0	3396	0
Between Entradero and Cordova	3446	0	3319	0
Between Cordova and Cristal	3382	0	3236	0
Between Cristal and Strawberry	3366	0	3224	0
Between Strawberry and Errecarte	3363	0	3219	0
Between Errecarte and Siega	3351	0	3198	0
North of Siega	3347	0	3193	0

Source: Austin-Foust Associates, Inc., April 2008.

¹ Traffic volumes apply to Alternative 1 and Alternative 2.

- c. *The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.*

As shown in Table F, the project would improve the vehicle speed along SR-74 by improving the LOS. Therefore, this criterion is not met.

The project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, a detailed CALINE4 CO hot-spot analysis was not required.

Table F: Roadway Segment LOS

Roadway Segment	2035 No Build LOS		2035 Build LOS	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
West of Via Cordova/Hunt Club	F	F	C	C
West of Via Cristal	F	F	C	B
West of Avenida Siega	F	F	C	B
East of Avenida Siega	F	F	C	B

Source: Austin-Foust Associates, Inc., April 2008.

5.2 SHORT-TERM CONSTRUCTION-RELATED IMPACTS

Construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, and motor vehicles transporting the construction crew. Exhaust emissions during the construction envisioned on site will vary daily as construction activity levels change. The use of construction equipment on site will result in localized exhaust emissions. The Caltrans Standard Specifications for construction (Sections 10 and 18 for dust control and Section 39-3.06 for asphalt concrete plant) will be adhered to in order to reduce emissions as a result of construction equipment.

Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions (PM₁₀). The best available control measures (BACM), as specified in SCAQMD Rule 403, shall be incorporated into the project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day), fugitive dust emissions from construction activities would not result in adverse air quality impacts.

Naturally Occurring Asbestos

The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. Therefore, the impact from NOA during project construction would be minimal to none.

5.3 LONG-TERM AIR QUALITY EFFECTS

Greenhouse Gases

According to a recent white paper by the Association of Environmental Professionals,¹ an individual project does not generate enough GHG emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emissions reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and that 40 percent of all human-made GHG emissions are from transportation, Caltrans has created and is implementing the *Climate Action Program at Caltrans* (December 2006).

Caltrans recognizes the concern that CO emissions raise for climate change. However, modeling and gauging the impacts associated with an increase in GHG emissions levels (including CO) at the project level is not currently possible. No federal, State, or regional regulatory agency has provided methodology or criteria for GHG emissions and climate change impact analysis. Therefore, Caltrans

¹ Hendrix, Michael, and Cori Wilson. *Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), p.2.

is unable to provide a scientific or regulatory-based conclusion regarding whether the project's contribution to climate change is cumulatively considerable.

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement AB 1493 and AB 32. As part of the *Climate Action Program at Caltrans* (December 2006), Caltrans is supporting efforts to reduce vehicle miles traveled (VMT) by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and in light and heavy-duty trucks. However, it is important to note that control of the fuel economy standards is held by the EPA and ARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California, Davis.

One of the main strategies to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources such as automobiles occur at stop-and-go speeds (0–25 mph) and speeds over 55 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions. The purpose of the proposed project is to alleviate existing and future traffic congestion along SR-74. Therefore, the proposed project would reduce the number of vehicle hours traveled (VHT) within the project area. The carbon dioxide emissions would be reduced due to the reduction in VHT and the improved traffic flow.

Air Quality Management Plan Consistency Analysis

An AQMP describes air pollution control strategies to be taken by counties or regions classified as nonattainment areas. The AQMP's main purpose is to bring the area into compliance with the requirements of federal and State air quality standards. The AQMP uses the assumptions and projections by local planning agencies to determine control strategies for regional compliance status. Therefore, any projects causing a significant impact on air quality would impede the progress of the AQMP.

A consistency analysis determination plays an essential role in local agency project review by linking local planning and unique individual projects to the AQMP in the following ways: (1) it fulfills the CEQA goal of fully informing local agency decision makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are fully addressed, and (2) it provides the local agency with ongoing information, assuring local decision makers that they are making real contributions to clean air goals defined in the most current AQMP (adopted in 2003). Because the AQMP is based on projections from local General Plans, projects consistent with the local General Plan are considered consistent with the AQMP.

As shown above, the proposed project will not significantly contribute to or cause deterioration of existing air quality; therefore, mitigation measures are not required for the long-term operation of the project. Hence, the proposed project is considered to be consistent with the Orange County's General Plan and the SCAG forecast, and is therefore consistent with the AQMP.

6.0 STANDARD CONDITIONS

The following standard conditions would reduce or minimize air pollutant emissions associated with construction activities:

- The construction contractor shall adhere to the requirements of SCAQMD rules and regulations on cutback and emulsified asphalt paving materials.
- To reduce fugitive dust emissions, the construction contractor shall adhere to the requirements of SCAQMD Rule 403. The best available control measures (BACMs) specified in SCAQMD's Rule 403 shall be incorporated into the project construction. The BACMs are listed in Table G at the end of this chapter.

In addition to the SCAQMD standard conditions to reduce construction emissions, the Caltrans Standard Construction Specifications shall be adhered to in order to reduce emissions. Below is a list of the Caltrans standard conditions provided to reduce the emission of fugitive dust.

- A. All disturbed areas, including storage piles, not being actively utilized for construction purposes shall be effectively stabilized for dust emissions using water, chemical stabilizers/suppressants, or vegetative ground cover.
- B. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized for dust emissions using water or chemical stabilizers/suppressants.
- C. All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled for fugitive dust emissions by utilizing applications of water or by presoaking.
- D. When materials are transported off site, all material shall be covered or effectively wetted to limit visible dust emissions, or at least 15.2 cm (6 in) of freeboard space from the top of the container shall be maintained.
- E. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (The use of blower devices is expressly forbidden.)
- F. Following the addition of materials to or the removal of materials from the surface of outdoor storage piles, said piles shall be effectively stabilized for fugitive dust emissions utilizing sufficient water or chemical stabilizers/suppressants.
- G. Traffic speeds on unpaved roads shall be limited to 24 kph (15 mph).
- H. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- I. Wheel washers for all exiting trucks shall be installed, or all trucks and equipment shall be washed off before leaving the site.

- J. Wind breaks shall be installed at windward side(s) of construction areas.
- K. Excavation and grading activity shall be suspended when winds exceed 32 kph (20 mph).
- L. Area subject to excavation, grading, and other construction activity shall be limited at any one time.

Compliance with the above standard measures would lessen the fugitive dust (PM₁₀) impact during construction.

Table G: Best Available Control Measures

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	<ul style="list-style-type: none"> • Mix backfill soil with water prior to moving • Dedicate water truck or high capacity hose to backfilling equipment • Empty loader bucket slowly so that no dust plumes are generated • Minimize drop height from loader bucket
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	<ul style="list-style-type: none"> • Maintain live perennial vegetation where possible • Apply water in sufficient quantity to prevent generation of dust plumes
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	<ul style="list-style-type: none"> • Use of high pressure air to clear forms may cause exceedance of Rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	<ul style="list-style-type: none"> • Follow permit conditions for crushing equipment • Pre-water material prior to loading into crusher • Monitor crusher emissions opacity • Apply water to crushed material to prevent dust plumes
Cut and fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	<ul style="list-style-type: none"> • For large sites, pre-water with sprinklers or water trucks and allow time for penetration • Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts

Table G: Best Available Control Measures

Source Category	Control Measure	Guidance
Demolition-mechanical/ Manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	<ul style="list-style-type: none"> Apply water in sufficient quantities to prevent the generation of visible dust plumes
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	<ul style="list-style-type: none"> Limit vehicular traffic and disturbances on soils where possible If interior block walls are planned, install as early as possible Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-moving activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	<ul style="list-style-type: none"> Grade each project phase separately, timed to coincide with construction phase Upwind fencing can prevent material movement on site Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Importing/ exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six in of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	<ul style="list-style-type: none"> Use tarps or other suitable enclosures on haul trucks Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage Comply with track-out prevention/mitigation requirements Provide water while loading and unloading to reduce visible dust plumes

Table G: Best Available Control Measures

Source Category	Control Measure	Guidance
Landscaping	10-1 Stabilize soils, materials, slopes	<ul style="list-style-type: none"> • Apply water to materials to stabilize • Maintain materials in a crusted condition • Maintain effective cover over materials • Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes • Hydroseed prior to rain season
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	<ul style="list-style-type: none"> • Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs • Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	<ul style="list-style-type: none"> • Dedicate water truck or high capacity hose to screening operation • Drop material through the screen slowly and minimize drop height • Install wind barrier with a porosity of no more than 50 percent upwind of screen to the height of the drop point
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	<ul style="list-style-type: none"> • Limit size of staging area • Limit vehicle speeds to 15 mph • Limit number and size of staging area entrances/exits

Table G: Best Available Control Measures

Source Category	Control Measure	Guidance
Stockpiles/Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than 8 feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	<ul style="list-style-type: none"> • Add or remove material from the downwind portion of the storage pile • Maintain storage piles to avoid steep sides or faces
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	<ul style="list-style-type: none"> • Apply gravel/paving to all haul routes as soon as possible to all future roadway areas • Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	<ul style="list-style-type: none"> • Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 in soak soils via the pre-trench and resuming trenching • Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six in (CVC 23114)	<ul style="list-style-type: none"> • Empty loader bucket such that no visible dust plumes are created • Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	<ul style="list-style-type: none"> • Haul waste material immediately off site

Table G: Best Available Control Measures

Source Category	Control Measure	Guidance
Unpaved roads/ parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	<ul style="list-style-type: none"> Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Source: SCAQMD, Rule 403, June 2005.

7.0 AVOIDANCE AND MINIMIZATION MEASURES

7.1 CONSTRUCTION IMPACTS

Implementation of the following avoidance and minimization measures will reduce air pollutants generated by vehicle and equipment exhaust during the project construction phase:

- The construction contractor shall select the construction equipment used on site based on low-emission factors and high-energy efficiency. The construction contractor shall ensure that construction grading plans include a statement that all construction equipment will be tuned and maintained in accordance with the manufacturer's specifications.
- The construction contractor shall utilize electric- or diesel-powered equipment in lieu of gasoline-powered engines where feasible.
- The construction contractor shall ensure that construction grading plans include a statement that work crews will shut off equipment when not in use.
- The construction contractor shall time construction activities so as not to interfere with peak-hour traffic and to minimize obstruction of through traffic lanes adjacent to the site; if necessary, a flagperson shall be retained to maintain safety adjacent to existing roadways.
- The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew.

7.2 OPERATIONAL IMPACTS

The proposed project will not significantly contribute to or cause deterioration of existing air quality; therefore, no mitigation is required.

8.0 REFERENCES

Austin-Foust Associates, Inc., State Route 74 Lower Ortega Highway Widening Traffic Analysis, April 2, 2008.

California Air Resources Board Web site: <http://www.arb.ca.gov>.

California Department of Transportation 1988. Air Quality Technical Analysis Notes.

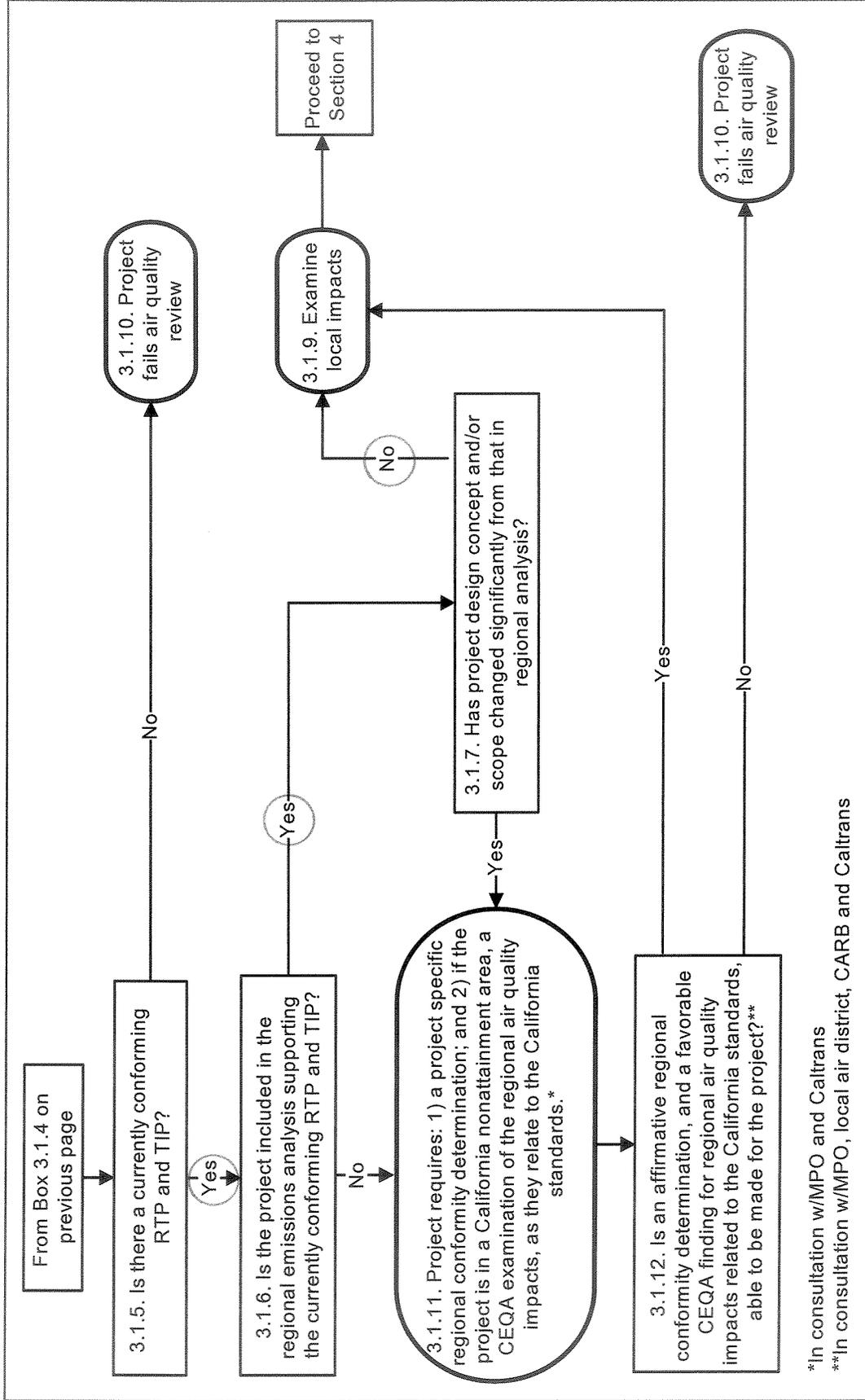
California Department of Transportation 1997. Transportation Project-Level Carbon Monoxide Protocol.

South Coast Air Quality Management District. Air Quality Management Plan. 2003.

South Coast Air Quality Management District. CEQA Air Quality Handbook. 1993.

Western Regional Climatic Center 2008.

APPENDIX A
CO HOT-SPOT ANALYSIS



*In consultation w/MPO and Caltrans

**In consultation w/MPO, local air district, CARB and Caltrans

Figure 1 (cont.). Requirements for New Projects

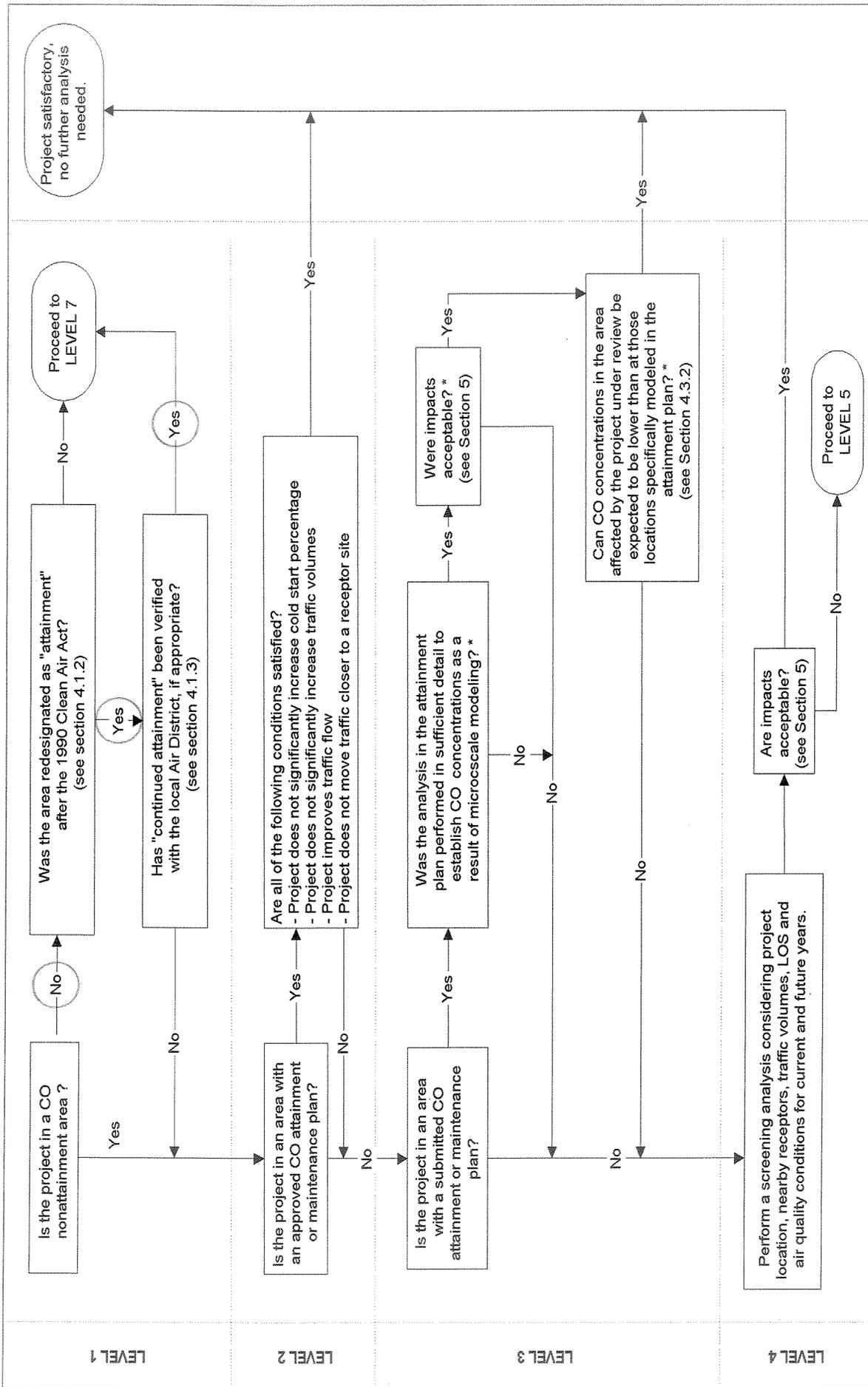
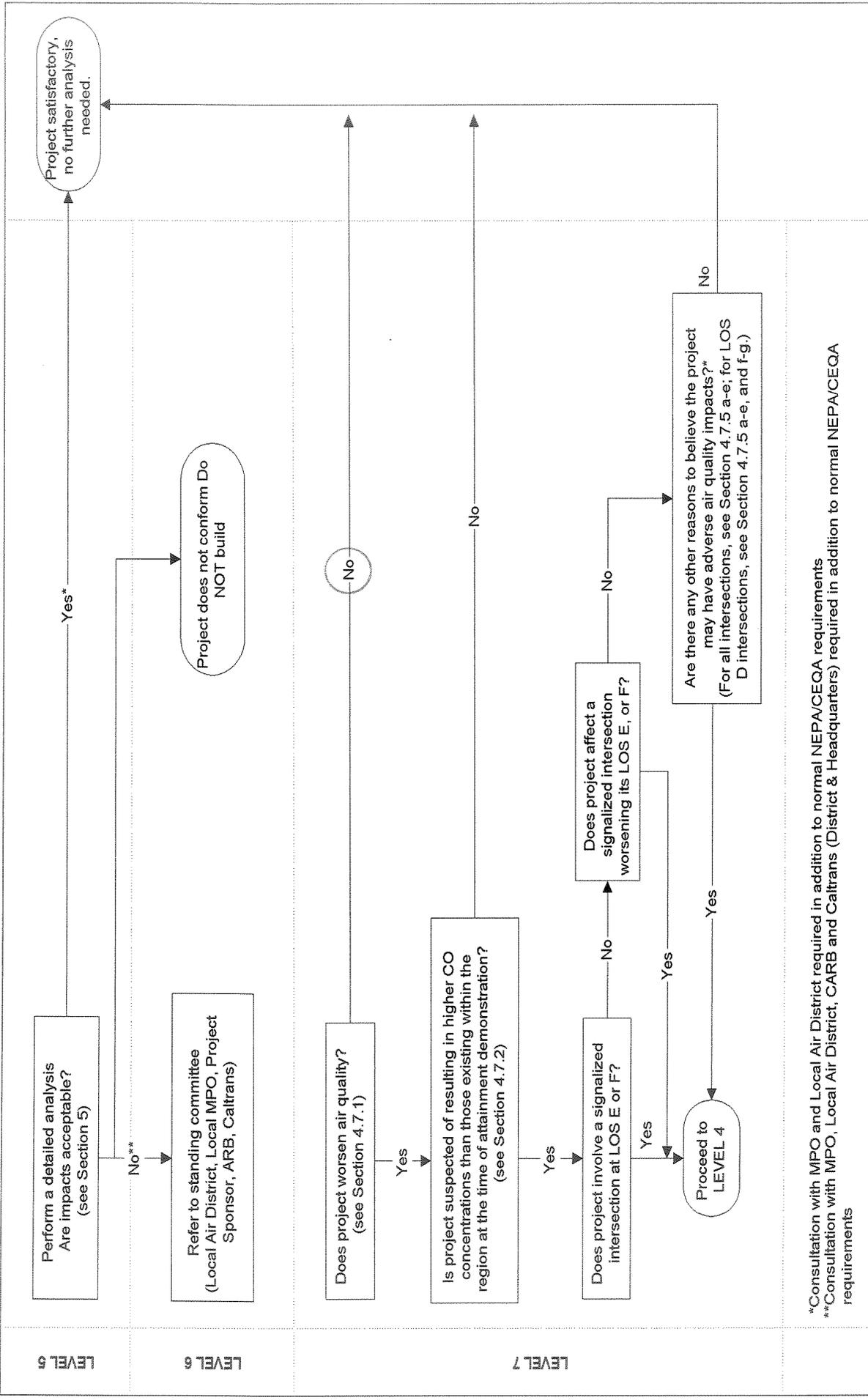


Figure 3. Local CO Analysis



*Consultation with MPO and Local Air District required in addition to normal NEPA/CEQA requirements
 **Consultation with MPO, Local Air District, CARB and Caltrans (District & Headquarters) required in addition to normal NEPA/CEQA requirements

Figure 3 (cont.). Local CO Analysis
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