FINAL

Air Quality Technical Study

SR-55/Newport Boulevard Improvements

Prepared for:
City of Costa Mesa
Caltrans, District 12
and
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Acronyms

AAM	Annual Arithmetic Mean
AAQS	ambient air quality standard
ADA	Americans with Disabilities Act
AGM	Annual Geometric Mean
APCD	Air Pollution Control Districts
AQMD	Air Quality Management Districts
AQMP	Air Quality Management Plan
ASTM	American Society for Testing and Materials
°C	degrees Celsius
CAA	Clean Air Act
CAAAs	Clean Air Act Amendments
CAAQS	California ambient air quality standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CO	carbon monoxide
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
ft	feet
km	kilometer
LOS	level of service
m	meters
$\mu g/m^3$	micrograms per cubic meter
mm	millimeters
mph	miles per hour
MPO	Metropolitan Planning Organization
MSL	mean sea level

NAAQS	National Ambient Air Quality Standards
NM	not measured
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
0_3	ozone
Pb	lead
PM_{10}	particulate matter of less than 10 microns in diameter
PM2.5	particulate matter of less than 2.5 microns in diameter
ppm	parts per million
ROG	reactive organic gases
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Program
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	oxides of sulfur
SR	State Route
TIP	Transportation Improvement Program
U.S.C.	United States Code
USDOT	United States Department of Transportation

EXECUTIVE SUMMARY

This study assesses the potential impacts to local and regional air quality expected to result from implementation of the State Route (SR)-55/Newport Boulevard Improvements Project.

Air pollutant emissions would occur from equipment operation during Project construction and from vehicle movements in the lanes during the operation phase. Emissions of criteria air pollutants (carbon monoxide [CO], oxides of nitrogen [NO_X], reactive organic gases [ROG], oxides of sulfur [SO_X], particulate matter of less than 10 microns in diameter [PM_{10}], and particulate matter of less than 2.5 microns in diameter [$PM_{2.5}$]) were estimated separately for each construction phase and for future operations. Mitigation measures are proposed to reduce emissions from construction equipment, other motor vehicle exhaust, and fugitive dust.

The South Coast Air Basin (SCAB) is classified as nonattainment for CO and PM_{10}. Screening analyses were performed to determine whether traffic along Newport Boulevard could result in significant increases to localized CO and PM_{10} concentrations. A qualitative PM_{10} hot spot analysis revealed that local PM_{10} hot spots are not expected. A quantitative screening CO hot spot analysis predicted that CO hot spots may occur. However, the CO concentrations because of the Build Alternative are lower than for the No-Build Alternative. Therefore, the SR-55/Newport Boulevard Improvements Project would not result in significant localized CO concentrations.

The Project build alternatives are consistent with the 2003 Draft Air Quality Management Plan (AQMP) for the SCAB and the 2002 Regional Transportation Improvement Plan (RTIP). The proposed Project is included in the 2002 RTIP; therefore, it conforms to requirements of the federal Clean Air Act Amendments (CAAAs) of 1990.

1. PROJECT DESCRIPTION AND ALTERNATIVES

1.1 Project Location and Setting

The proposed Project is located in the City of Costa Mesa in Orange County (Figure 1). Specifically, it is along State Route (SR)-55/Newport Boulevard in the City of Costa Mesa's Downtown Redevelopment Area and extends from approximately 140 meters (m) (460 feet [ft]) north of 19th Street to 17th Street with minor work south of 17th Street for restriping. The portion of SR-55 designated as a freeway ends at 19th Street, and then it continues as a divided highway to the south, past 17th Street. The highway segment within the Project limits includes five closely spaced signalized intersections, along with several at-grade T-intersections where local streets intersect either the northbound or the southbound lanes of the highway.

The majority of land uses within the urbanized Project area is zoned as commercial. Curbside on-street parking exists along northbound Newport Boulevard, and pedestrians cross SR-55/Newport Boulevard to access business and entertainment facilities located along the highway.

1.2 Project Description and Alternatives

The Project proposes to improve traffic and pedestrian conditions along SR-55/Newport Boulevard within the Project limits. Currently, traffic along the highway exceeds capacity and both the 19th Street and 17th Street intersections rank among the most highly congested in the county.

1.2.1 Alternatives

The two alternatives considered for Newport Boulevard are as follows:

No Build Alternative

Under this alternative, there would be no additional lanes or other improvements provided through the Project limits. This alternative would retain the roadway with its existing lane configuration of three through lanes in each direction with turn lanes. Traffic demand would continue to increase, and congestion through the Project limits would worsen.

Build Alternative – Addition of a fourth northbound lane from 17th Street to 19th Street and a fourth southbound lane through the 19th Street intersection

This alternative includes the addition of a fourth northbound lane through the entire Project limits and the addition of a fourth southbound lane through the 19th Street intersection only. Curb locations would not be changed along the northbound lanes between Old 17th Street and 19th Street, or along the southbound lanes between Harbor Boulevard and 19th Street. Existing curbside on-street parking along the northbound lanes would be retained from 17th Street to Flower Street. Sidewalk and curb improvements will be evaluated at the south end of the Project; spot sidewalk and curb reconstruction would be completed to repair damaged concrete where required. Driveway accesses and curb ramps would be constructed or reconstructed to meet the requirements of the Americans with Disabilities Act (ADA), where feasible. Bus stop locations will be reviewed for adherence to Orange County Transit Authority requirements. Landscaping and aesthetic improvements will be considered for the Project limits.

Minor right-of-way acquisitions may be required for this alternative to complete the above improvements. For this alternative, various combinations of lane widths and median widths will be studied.

2. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION MEASURES

2.1 Affected Environment

2.1.1 Introduction

Air quality impacts were evaluated for this Project because the proposed SR-55/Newport Boulevard Improvements Project has the potential to generate substantial air emissions during both the construction and operation phases. The emissions associated with construction phase activities include operation of construction equipment, disturbance of soil, and consumption of energy to power construction equipment. The emissions associated with the Project operation phase would be from vehicular traffic.

2.1.2 Environmental Setting

SR-55/Newport Boulevard is located in the Los Angeles Basin, which is within the 6,600-square-mile South Coast Air Basin (SCAB). The SCAB encompasses all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. It consists of a coastal plain with interconnecting broad valleys and low hills. Elevations range from sea level to over 3,353 m (11,000 ft) above mean sea level (MSL). The South Coast Air Quality Management District (SCAQMD) has jurisdiction over air quality issues within the SCAB.

The Project site is located in the City of Costa Mesa, which is adjacent to the City of Santa Ana and is characterized by a business district and residential areas. While the SCAB has some of the most unhealthful air quality in the nation, air quality within the SCAB continues to show improvement. Also, because of Costa Mesa's proximity to the Pacific Ocean, air quality in Costa Mesa is generally better than more inland portions of the SCAB.

According to the California Division of Mines and Geology (CDMG), the project is not located in an area of naturally occurring asbestos (NOA). NOAs are identified based on the type of rock found in that area. Asbestos-containing rocks found in California include ultramathic rock and serpentinite, which are not present in the project area (CDMG, 2003).

2.1.3 Climate/Meteorology

Warm dry summers, low precipitation, and mild winters characterize the overall climate in the SCAB. The average daily winter temperature is 51 degrees Fahrenheit (°F) (10.6 degrees Celsius [°C]), and the average daily summer temperature is 75ºF (23.9°C). During the year, temperatures range from a low near 20°F (-6.7°C) during the winter to a high of over 100°F (37.8°C) during the summer. More than two-thirds of the annual rainfall occurs from December through March, with approximately 90 percent occurring between November and April. The mean annual precipitation in the Costa Mesa/Santa Ana area over a 53-year period (1948-2001) was 330 millimeters (mm) (12.99 inches) – somewhat less than experienced by the Los Angeles Basin as a whole. The average monthly minimum temperature during the months of November through March is 46.7°F (8°C). The warmest months, July through September, experience an average maximum monthly temperature of 83.5°F (28.6°C). Winds in the Project area are usually driven by the dominant land/sea

breeze circulation system. Daytime onshore sea breezes dominate the regional wind patterns. At night, the winds generally slow down and reverse direction, traveling towards the sea. Local canyons alter the wind direction, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (less than 2 miles per hour [mph]) is less than 10 percent. Therefore, there is little stagnation in the Project vicinity, especially during busy daytime traffic hours. The SCAB experiences a persistent temperature inversion (increasing air temperature with increasing altitude) because 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. This phenomenon is observed in mid-afternoon to late afternoon on hot summer days, when the smog appears to suddenly clear up. Winter inversions frequently break by mid-morning.

The California Air Resources Board (CARB) maintains monitoring stations throughout the SCAB to monitor concentrations of criteria pollutants in the air. The nearest CARB monitoring station to the Project site that measures all criteria pollutants, except particulate matter of less than ten microns in diameter (PM_{10}), is the South Coastal Orange County Station (Station No. 060591003-1) in Costa Mesa. This station is located at 2850 Mesa Drive, approximately 5 kilometers (km) (3.1 miles) from the Project site. PM_{10} is measured at another South Coastal Orange County Station (Station No. 060590001-1) in Anaheim. This station is located at 1610 South Harbor Boulevard, approximately 20 km (12 miles) from the Project site. Table 1 provides monitored ambient air quality data from both stations for the last 3 years available (2000-2002).

Table 1
Air Pollutant Data Summary from South Coastal Orange County (Costa Mesa & Anaheim) Monitoring Stations (2000-2002)[4]

Pollutant	EPA Monitoring Station Data		
	2000	2001	2002
Ozone (O_3)			
Highest 1 hour, ppm	0.102	0.098	0.087
Days > 0.12 ppm[1]	0	0	0
Days > 0.09 ppm[2]	1	1	0
Highest 8-hour, ppm[3]	0.069	0.067	0.067
Days > 0.08 ppm[1]	0	0	0
Carbon Monoxide (CO)			
Highest 1 hour, ppm	7.8	6.2	4.8
Days > 35.0 ppm[1]	0	0	0
Days > 20.0 ppm[2]	0	0	0
Highest 8 hour, ppm	6.3	4.6	3.2
Days > 9.0 ppm[1,2]	0	0	0
Nitrogen Dioxide (NO_2)			
Highest 1 hour, ppm	0.107	0.082	0.106

Table 1
Air Pollutant Data Summary from South Coastal Orange County (Costa Mesa & Anaheim) Monitoring Stations (2000-2002)[4]

Pollutant	EPA Monitoring Station Data		
	2000	2001	2002
Days > 0.25 ppm[2]	0	0	0
Annual Average	0.02	0.017	0.015
Days > 0.053 ppm[1]	0	0	0
Sulfur Dioxide (SO_2)			
Highest 24 hour, ppm	0.005	0.005	0.007
Days > 0.14 ppm[1]	0	0	0
Days > 0.25 ppm[2]	0	0	0
Particulates (PM_{10})			
Highest 24 hour	126	93	64
Days > 150 μg/m^3 [1]	0	0	0
Days > 50 μg/m^3 [2]	8	9	5
Fine Particulate ($PM^{2.5}$)			
Highest 24 hour	113.9	70.8	68.6
Days > 65 μg/m^3 [1]	6	1	1
Annual Average	20.3	22.0	18.6
Days > 15 μg/m^3 [1]	n/a	n/a	n/a
Lead (Pb)	N/A	N/A	N/A

ppm - parts per million
μg/m^3 - micrograms per cubic meter
NM - Not measured at this station
AAM - Annual Arithmetic Mean
AGM - Annual Geometric Mean
[1]Federal Standard
[2]State Standard
[3]8-hour ozone based on 3-year average
[4]All pollutants are measured at the Costa Mesa Monitoring Station except for PM_{10}, which is measured at the Anaheim Station.

Source: EPA Air Data and CARB.

2.1.4 Air Quality Regulations

Federal Regulations/Standards

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 several major pollutants, termed "criteria" pollutants because the standards are supported by specific medical evidence. The NAAQS are two-tiered: primary standards to protect public health and secondary standards to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property).

The six criteria pollutants are ozone (O_3), carbon monoxide (CO), PM_{10} (includes diesel particulate matter), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Table 2 shows the primary standards for these pollutants, and Table 3 shows the health effects resultant from exposure to these pollutants.

On July 18, 1997, the USEPA issued new final rules regarding NAAQS for ozone and particulate matter. The change lowered the federal 24-hour PM_{10} standard, added a 24-hour and annual $PM_{2.5}$ standard, and changed the 1-hour ozone standard to an 8-hour standard. The PM_{10} standard was promulgated and is the current standard in effect today. The $PM_{2.5}$ and ozone standards were challenged and their enforcement was blocked by a court decision. On May 14, 1999 the US Court of Appeals remanded the authority to set new NAAQS back to the USEPA, but concluded that the new 8-hour ozone standard "cannot be enforced." On February 27, 2001 the US Supreme Court overturned the ruling and reinstated the 8-hour ozone standard. However, the court found that the EPA's implementation policy was unlawful and that the EPA needed to develop a reasonable implementation. Recently an agreement was reached between the USEPA, local air agencies, and industry representatives on how to implement the new 8-hour ozone standard. A new implementation plan was developed and published in the Federal Register. With that, the new 8-hour ozone standard went into affect.

New attainment designations for ozone and $PM_{2.5}$ will be made in 2004, after which local state authorities must develop their own enforceable implementation plans by 2006. Based on current available data, it appears that the project area would be designated as non-attainment for the both the 24-hour and annual $PM_{2.5}$ standards. Ozone concentrations in the area have been steadily decreasing over the years. However, the 1-hour concentrations have been above state standards which are more stringent than the federal standard. It is expected that once federal designations have been made, CARB will issue a state 8-hour ozone standard. In 2001 and 2002, the 8-hour ozone levels in the project area have been below the federal standard. If this trend continues, it is expected that the project area will be designated as attainment for the federal 8-hour ozone standard. Until CARB issues their 8-hour ozone standard, final designation for the area cannot be determined.

Table 2
Ambient Air Quality Standards

Pollutant	Average Time	State Concentration	Federal Primary	Federal Secondary
Ozone	1 Hour 8-Hour	0.09 ppm (180 µg/m3)	0.12 ppm (235 µg/m^3) 0.08 ppm (155 µg/m^3)	Same as Primary Standard Same as Primary standard
Nitrogen Dioxide	Annual Average 1 Hour	– 0.25 ppm (470 µg/m^3)	0.053 ppm (100 µg/m^3) –	Same as Primary Standard
Carbon Monoxide	8 Hour 1 Hour	9 ppm (10 mg/m^3) 20 ppm (23 mg/m^3)	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	

Table 2
Ambient Air Quality Standards

Pollutant	Average Time	State Concentration	Federal Primary	Federal Secondary
PM_{10}	Annual Geometric Mean	30 μg/m³	–	
	Annual Arithmetic Mean	–	50 μg/m³	Same as Primary Standard
	24 Hour	50 μg/m³	150 μg/m³	
$PM_{2.5}$	24 Hour		65 μg/m³	Same as Primary standard
	Annual Average		15 μg/m³	Same as Primary standard
Sulfur Dioxide	Annual Average	–	80 μg/m³ (0.03 ppm)	–
	24 Hour	0.04 ppm (105 μg/m³)	365 μg/m³ (0.14 ppm)	–
	3 Hour	–	–	1300 μg/m³ (0.5 ppm)
	1 Hour	0.25 ppm (655 μg/m³)	–	–
Lead	30-Day Average	1.5 μg/m³	–	–
	Calendar Quarter	–	1.5 μg/m³	Same as Primary Standard
Sulfates	24 Hour	24 μg/m³	–	–
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m³)	–	–
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 μg/m³)	–	–
Visibility-Reducing Particles	8 Hour (10:00 am to 6:00 pm, PST)	**	–	–

** Insufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent. Measurement in accordance with CARB Method V.

Source: CARB, 2002.

Table 3
Health Effects Summary for Air Pollutants

Pollutants	Sources	Primary Effects
Ozone	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	Aggravation of respiratory and cardiovascular diseases; irritation of eyes; impairment of cardiopulmonary function; plant leaf injury.
Nitrogen Dioxide	Motor vehicle exhaust; high temperature; stationary combustion; atmospheric reactions.	Aggravation of respiratory illness; reduced visibility; reduced plant growth; formation of acid rain.

Table 3
Health Effects Summary for Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, and natural events such as decomposition of organic matter.	Reduced tolerance for exercise; impairment of mental function; impairment of fetal development; death at high levels of exposure; aggravation of some heart disease (angina).
PM_{10} $PM_{2.5}$	Stationary combustion of solid fuels; construction activities; industrial processes; atmospheric chemical reactions.	Reduced lung function; aggravation of the effects of gaseous pollutants; aggravation of respiratory and cardiorespiratory diseases; increased cough and chest discomfort; soiling; reduced visibility.
Sulfur Dioxide	Combustion of sulfur-containing fossil fuels; smelting of sulfur-bearing metal ores; industrial processes.	Aggravation of respiratory diseases (asthma, emphysema); reduced lung function; irritation of eyes; reduced visibility; plant injury. Deterioration of metals, textiles, leather, finishes, coating, etc.
Lead	Contaminated soil.	Impairment of blood function and nerve construction; behavioral and hearing problems in children.

Source: CARB, 2002.

Data collected at permanent monitoring stations are used by EPA to classify regions as "attainment" if the primary NAAQS have been achieved, or "nonattainment" if the NAAQS are not achieved. The SCAB is currently classified as a nonattainment area for three criteria pollutants: O_3, PM_{10}, and CO. The remaining three criteria pollutants are classified as attainment.

The CAA originally set a 5-year deadline for NAAQS attainment; however, the attainment date was subsequently revised by the Clean Air Act Amendments (CAAAs), which also required the states to identify nonattainment subareas within their borders and to develop an EPA-approved State Implementation Plan (SIP) demonstrating attainment of all NAAQS by 1982. In a later EPA mandate, that attainment deadline was extended to 1987. The 1990 CAAAs specify new strategies for attaining NAAQS nationwide over the next 20 years, including mandatory 3 percent annual reductions of air pollutant emissions for both existing and new stationary sources, the scheduled introduction of low-emission cars and trucks into the nation's motor vehicle fleet, and the development of mass transit or higher occupancy vehicle alternatives to the single-passenger automobile. The 1990 CAAAs designated the SCAB as follows: "extreme" for O_3, requiring attainment with the federal O_3 standard by 2010; "serious" for CO, requiring attainment of federal CO standards by 2000; and "serious" for PM_{10}, requiring attainment with federal standards by 2006. The SCAB still has not reached CO attainment.

In response to CAA requirements, SCAQMD and the Southern California Association of Governments (SCAG), which has been designated by EPA as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA, prepared a draft 2003 Air Quality Management Plan (AQMP) for attainment of ambient air quality standards (AAQS).

State Regulations/Standards

The State of California began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Table 2 also lists these standards.

Originally, there were no attainment deadlines for the CAAQS. However, the California Clean Air Act (CCAA) of 1988 provided a time frame and a planning structure to promote attainment. The CCAA required nonattainment areas in the State to prepare attainment plans, and it proposed to classify each such area on the basis of the submitted plan, as follows: moderate, if CAAQS attainment could not occur before December 31, 1994; serious, if CAAQS attainment could not occur before December 31, 1997; and severe, if CAAQS attainment could not be conclusively demonstrated at all. The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of nonattainment pollutants, unless all feasible measures have been implemented. According to the CAAQS, the SCAB is classified as a "severe" nonattainment area for O_3, CO, and PM_{10}.

2.1.5 Regional Air Quality Planning

CARB coordinates and oversees both state and federal air pollution control programs in California. CARB has divided the state into 15 air basins. Significantly, authority for air quality control within them has been given to local Air Pollution Control Districts (APCD) or Air Quality Management Districts (AQMD), which regulate stationary source emissions and develop local nonattainment plans. CARB has designated all of Los Angeles County south of the San Gabriel Mountains, Orange County, and the non-desert portions of Riverside and San Bernardino Counties as the Basin under the jurisdiction of SCAQMD. SCAQMD is responsible for regulating stationary source emissions, and it has the authority to regulate mobile emissions as an indirect source. SCAQMD and SCAG jointly conduct air quality planning in the Basin. CARB regulates motor vehicles and fuels.

Regional Air Quality Management Plan

Compliance with the provisions of the federal CAA and CCAA is the primary focus of the latest AQMP developed by SCAQMD and SCAG. The Plan is revised every 3 years, with the latest version adopted by SCAQMD being the 1997 AQMP, as modified by the 1999 amendments. CARB adopted the latest AQMP in February 1997, and it was included in the SIP and sent to EPA for its review and approval.

According to the 1997 AQMP, attainment for all federal health standards is to occur no later than 2000 for CO, 2006 for PM_{10}, and 2010 for O_3. State standards would be attained no later than 2000 for CO. State standards for O_3 and PM_{10} would not be achieved until after 2010.

SCAQMD has prepared a 2003 draft to revise its AQMP. This revision would set the date for CO attainment to 2004. PM_{10} attainment of the NAAQS would be 2006 and attainment of the CAAQS to beyond 2010. O_3 NAAQS attainment would be scheduled for 2010 and attainment of the CAAQS to beyond 2010.

2.2 Consistency with Applicable Regional Plans

The SR-55/Newport Boulevard Improvements Project is included in the 2002 Regional Transportation Improvement Plan (RTIP).

The 2002 RTIP programs total $24.7 billion for implementing the transportation projects within the next 6 fiscal years (2002/03-2007/08). All projects incorporated into the 2002 RTIP are consistent with the current Regional Transportation Program (RTP) policies, programs, and projects.

The 2002 RTIP was developed in compliance with state and federal requirements. County Transportation Commissions have the responsibility under State law of proposing county projects, using policies, programs, and projects of the current RTP as a guide, from among submittals by cities and local agencies. The locally prioritized lists of projects were forwarded to SCAG for review. From this list, SCAG developed the 2002 RTIP based on consistency with the current RTP, inter-county connectivity, financial constraint, and conformity satisfaction.

In the SCAG region, a biennial RTIP update is produced on an even-year cycle. The current operating 2001 RTIP was prepared because, under federal law, within 6 months of federal approval of a new RTP (i.e., the 2001 RTP), a new federally approved and conforming RTIP must be in place, otherwise the operating RTIP will expire. The current operating 2001 RTIP was approved by the federal agencies (including its final conformity determination) on September 25, 2001. An amendment to the 2001 RTP and 2001 RTIP was federally approved on May 10, 2002. The United States Department of Transportation (USDOT) approved the 2002 RTIP on October 4, 2002.

2.3 Conformity Determination

The CAAAs of 1990 require that transportation plans, programs, and projects that are funded by or approved under Title 23 United States Code (U.S.C.) or the Federal Transit Act, conform to state or federal air quality plans. To be in conformance, a project must come from approved transportation plans and programs such as the SIP, RTP, and RTIP. SCAG, as the federally recognized MPO and the designated regional transportation planning agency, is responsible for preparing the RTP and RTIP. As part of its regional planning responsibilities, SCAG prepares the demographic projections and integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the AQMP. These projections are used for determining conformity to the AQMP for proposed federal projects, plans, and programs.

The proposed Project is identified in the "Orange County State Highway" project listing of the federally approved 2002 RTIP as "ORA000161" (Appendix B). The 2002 RTIP received USDOT approval on October 4, 2002. Given that the SR-55/Newport Boulevard Improvements Project is consistent with the 2001 RTP and included in the 2002 RTIP, the Project conforms to the requirements of the federal CAAAs of 1990 and will not interfere with the timely implementation of all Transportation Control Measures (TCMs) identified in the currently approved SIP.

2.4 Potential Air Quality Impacts

Air quality impacts are usually divided into short term and long term. Short-term impacts are usually the result of construction or grading operations. Long-term impacts are associated with the built-out condition of the proposed Project.

2.4.1 Thresholds of Significance

Project-related air contaminant emissions would have a significant effect if they result in concentrations that create either a violation of an AAQS or contribute to an existing air quality violation. Should ambient air quality already exceed existing standards, SCAQMD has established specific significance threshold criteria for emissions to account for the continued degradation of local air quality. Table 4 outlines the threshold criteria recommended for use in evaluating the effects on existing local air quality violations.

SCAQMD does not require that air dispersion modeling be conducted for PM_{10} to assess the significance of a project's impact to air quality during construction.

Table 4
Significance Criteria – Allowable Regional Emission Limits

Air Pollutant	Construction Phase		Operational Phase
	(lbs/day)	(tons/quarter)	(lbs/day)
Reactive Organic Gases (ROG)	75	2.50	55
Carbon Monoxide (CO)	550	24.75	550
Nitrogen Oxides (NO_x)	100	2.50	55
Oxides of Sulfur (SO_x)	N/A	6.75	150
Particulates (PM_{10})	150	6.75	150
Fine Particulates ($PM_{2.5}$)[1]	N/A	N/A	N/A

Source: SCAQMD, California Environmental Quality Act (CEQA) Air Quality Handbook, 1993.

1 $PM_{2.5}$ has not been added to the CEQA handbook at this time.

2.4.2 Short-Term Impacts

Temporary air quality impacts would result from Project construction activities. Air pollutants would be emitted by construction equipment, and fugitive dust would be generated during construction activities such as pavement grinding and paving operations.

Emissions from construction activities are estimated using emission factors established by EPA (according to the *1993 CEQA Handbook*, estimated emission factor for disturbed soil is 26.4 pounds of PM_{10} per day per acre). If water or other soil stabilizers are used to control dust required by SCAQMD Rule 403, the emissions can be reduced by 50 percent. The PM_{10} calculations include the 50 percent reduction from watering.

The construction phase is expected to last for approximately 3 months. The construction schedule is based on one 8-hour shift per day, 5 days per week, and is expected to occur during the night-time hours. Construction will comprise of the following six stages:

1. Removal of medians, sidewalks, and curbs
2. Construction of new medians, sidewalks, and curbs
3. Grinding and removal of pavement
4. Construction of new pavement
5. Restriping of new pavement
6. Landscaping and other aesthetic work

Criteria pollutant emissions were calculated for these activities and are summarized in Table 5. Fugitive dust emissions would also be generated during Stages 3 and 4 of construction. These emissions are also included in Table 5. Since there is no significance criteria for $PM_{2.5}$, $PM_{2.5}$ emissions are not included in this analysis. No structures would be demolished as a result of the Project; therefore, there is no risk of structural asbestos being released into the air.

Table 5
Summary of Construction Phase Emissions

Stage	Time (weeks)	Emissions (lbs/day)				
		CO	ROG	NO_X	SO_X	PM_{10}[1]
Mobilization [2]	2	5.26	0.84	0.45	0.00	0.22
1	1	16.99	2.30	12.28	0.21	0.92
2	2	5.83	0.99	3.22	0.00	0.40
3	1	18.91	16.69	13.17	0.23	26.97
4	1	10.34	2.28	13.02	0.23	26.96
5	1	5.55	0.92	1.84	0.00	0.31
6	4	5.83	0.99	3.22	0.00	0.40
Threshold		**550**	**75**	**100**	**150**	**150**

[1]PM_{10} emissions include fugitive dust emissions.
[2]Mobilization occurs prior to construction.

The stages of construction will be performed sequentially. The maximum daily emissions will occur during Stage 3. There are no standards for determination of conformity for construction emissions; therefore, the daily emissions thresholds set forth in SCAQMD's *1993 CEQA Air Quality Handbook* were used as a guideline. Based on the calculation results, no significant daily emissions would occur during any phase of construction. However, to further reduce project emissions, mitigation measures will be implemented during construction activities. These measures are presented in Section 2.5.

2.4.3 Long-Term Impacts

Regional Air Quality

The primary source of regional emissions generated by the proposed Project will be from motor vehicles.

Emission rates for vehicles and various types of trucks were estimated using EMFAC2002. EMFAC2002 is a computer program generated by CARB that calculates emission rates for

vehicles. The emission factors were calculated based on an assumption that an average speed of 25 mph for the future No-Build Alternative would occur, and 30 mph for the future Build Alternative would be achieved. It is noteworthy that the results of emission calculations are expected to be similar between the future No-Build and Build Alternative, since the total traffic volume is not expected to change and the average vehicle travel speeds are similar. Therefore, CEQA requirements regarding a regional analysis are satisfied.

The Project is included as part of the 2002 RTIP. The 2002 RTIP has been federally approved to conform with the 2001 RTP and the State's Transportation Improvement Program (TIP). Estimated emissions from the Project were included as part of the 2002 RTIP. The proposed improvements to Newport Boulevard are not significantly different from the proposed improvements included in the regional analysis of the RTIP. Therefore, an additional regional analysis is not required for this Project.

Local Air Quality

CO and PM_{10} are the pollutants of major concern along roadways. For this reason, CO and PM_{10} concentrations are usually indicative of the local air quality generated by a roadway network, and they are used as an indicator of its impacts on local air quality. A CO hot spot screening analysis was performed following the California Department of Transportation (Caltrans) document *Transportation Project-Level Carbon Monoxide Protocol* (Caltrans, 1998). A qualitative PM_{10} hot spot analysis was performed following *Caltrans Interim Guidance: Project-Level PM_{10} Hot Spot Analysis* (Caltrans, 2000) and the Federal Highway Administration's (FHWA) *Guidance for Qualitative Project-Level Hot Spot Analysis in PM_{10} Non-Attainment and Maintenance Areas* (FHWA, 2001).

CO Hot Spot Screening Analysis

A CO hot spot analysis was performed for the Project comparing the CO concentrations resulting from the Build versus the No-Build Alternatives. The three steps performed included:

1. Determining if local impacts need to be examined. This was done by following the flowchart shown in Figure 1 of the Caltrans protocol (Caltrans, 1998). According to the protocol, the Project will be required to examine local impacts.

2. Determining the level of analysis required for the Project. This was done by following the flowchart shown in Figure 3 of the protocol (Caltrans, 1998). According to the protocol, this Project would require a Level 4 analysis, which involves a screening analysis considering the project location, nearby receptors, traffic volumes, level of service (LOS), and air quality conditions for current and future years.

3. Conducting a Level 4 analysis, which involved a quantitative screening analysis based on Appendix A of the protocol. Details of this analysis are provided below.

Table 6 shows peak current and future traffic volumes that were developed based on the traffic study performed for this Project.

Table 6
Predicted Year 2025 Traffic Volumes

Movement	AM Peak			PM Peak		
	Vehicles per hour[1]	Vehicles per Hour per Lane[2]		Vehicles per hour[1]	Vehicles per Hour per Lane[2]	
		Build	No-Build		Build	No-Build
Newport Boulevard @ 19th Street						
Southbound	3,280	547	656	4,229	705	846
Westbound	401	80	80	407	81	81
Northbound	3,929	655	786	3,364	561	673
Eastbound	1,083	217	217	1,418	284	284
Newport Boulevard @ 17th Street						
Southbound	3,330	666	666	3,739	748	748
Westbound	1,082	180	180	852	142	145
Northbound	2,534	422	507	2,440	407	488
Eastbound	1,114	223	223	1,324	265	265

[1]The future Build and No-Build Alternatives are expected to result in the same traffic volumes.
[2]Build options add a northbound and southbound lane at 19th Street and a northbound lane at 17th Street.

Table 7 shows information used as part of the analysis.

Table 7
Parameters Used in Quantitative Screening Analysis

Parameter	Value
Project Location	Coastal Area
Average cruise speed (mph) No-Build Build	 25 [1] 30 [1]
% Red Time Both Alternatives	 50% [1]
Percentage of Cold Starts Both Alternatives	 15% [1]
Analysis Year	2012 [2]
Worst-case Wind Speed	1.0 m/s [1,3]
8-Hr Persistence Factor	0.7
Receptor Distance No-Build Build	 3 m 3 m

[1] Value used was assumed based on Project design.
[2] 2012 is the latest year the protocol predicts concentrations. Concentrations for year 2025 are expected to be lower than predicted by the protocol.
[3] Average wind speed in the area is greater than 1.0 m/s.

The purpose of the screening procedure is to obtain conservative estimates of CO concentrations without having to run the computational models, i.e. EMFAC and CALINE4, as required for a detailed analysis. This screening procedure is not applicable to all projects. Projects that meet any of the following scenarios should not perform a screening analysis:

Vehicles in cold start mode > 50%
Percentage of Heavy Duty Gas Trucks > 1.2%
Traffic volumes > 1000 vphpl
January mean minimum temperature < 35°F

This project does not meet the above scenarios; therefore the screening procedure was determined to be appropriate. Since a detailed analysis is not warranted due to the use of the screening procedure, specific modeling programs such as EMFAC (or its newer version EMFAC2002) are not required.

Qualitative PM_{10} Hot Spot Analysis

The PM_{10} hot spot analysis was performed following the qualitative analysis protocols of Caltrans and providing information as suggested in the FHWA guidance. The Caltrans protocol was designed to aid projects in PM_{10} non-attainment and maintenance areas. This analysis involves six steps to determine if PM_{10} emissions from the Project would result in potential significant impacts. The six-step determination is discussed below

1. All of California has been designated a nonattainment area for PM_{10}. Therefore, PM_{10} hot spots could occur throughout California.

2. Local monitored data taken at CARB's Anaheim Station (see Table 1) show that the local PM_{10} concentrations for the past 3 years have exceeded the CAAQS, but not the NAAQS. Therefore, local PM_{10} hot spots could occur.

3. There are no unusual circumstances existing in the Project vicinity that would result in local PM_{10} concentration increases. The area surrounding the Project is well developed with little exposed open space. The area is also highly residential and commercial and high concentrations of diesel trucks are not expected. Smaller gasoline vehicles, not diesel trucks, would normally service the commercial locations.

4. Although there are no unusual circumstances that may cause an increase in local PM_{10} concentrations, the Project will implement all mitigation measures as required by the SIP.

5. The SIP includes control measures affecting transportation projects. The SIP conforms to all applicable regulations. Therefore, the Project, by following control measures included in the SIP, will also conform to all applicable regulations.

6. Since the Project is included in the 2002 RTIP and all conformity requirements have been met, consultation with other agencies is not expected to be required.

According to FHWA guidance, qualitative methods can be categorized into the following approaches:

1. Comparison to another location with similar characteristics

2. Findings from air quality studies

The analysis for this project would fall under approach 2. As previously stated, this project is included in the 2002 RTIP. An air quality study was performed as part of the RTIP, and found to be in compliance with state and federal requirements.

The FHWA guidance also suggests that the following information also be included in the analysis:

1. Project Description
2. Influence Factors
3. Statement of Existing Air Quality
4. Mitigation Practices

The project description is provided in Section 1.2. There are two influencing factors regarding PM_{10} emissions from this project. Construction activities will result in the generation of PM_{10} emissions from equipment exhaust and from fugitive dust. However, construction activities are temporary and are not expected to result in long term air quality impacts. The other factor is that this project involves the modification of the street to relieve congestion from local traffic. Although this improvement will add additional capacity, the main effect will be the reduction in idling times of vehicles traveling along this route. Since more PM_{10} emissions are generated by vehicle engines during idling, this reduction in idling times would result in an overall air quality benefit. The existing air quality in the area is presented in Sections 2.1.2 and 2.1.3. Lastly, mitigation practices are presented in Section 2.5.

2.4.4 Analysis Results

Short-Term Impacts

Emissions generated during the construction phase of the Project are expected to result in insignificant emissions of criteria pollutants, including fugitive PM_{10}. Due to the short term of the construction phase, all impacts will be temporary. Various control measures will be implemented to reduce PM_{10} emissions during construction.

Long-Term Impacts

The CO screening analysis predicted that the Build and No-Build CO concentrations at Newport Boulevard and 17th Street would be similar during both peak AM and PM hours. The Build Alternative at Newport Boulevard and 19th Street would result in lower CO concentrations for both the peak AM and PM hours. Combining the predicted 1-hour CO concentrations with the monitored CO concentrations predicts the final expected local CO concentrations because of the Project. The results presented in Table 8 show that neither the No-Build nor the Build options would result in localized 1-hour CO hot spots (exceedances of federal or state AAQS). Combining the predicted 8-hour CO concentration with the highest monitored CO concentration, shown in Table 9, results in exceedances of the 8-hour federal and state AAQS.

Table 8
Total Predicted Local 1-Hour CO Concentrations

	AAQS (ppm)		No Build 1-Hour CO Concentration (ppm)			Build 1-Hour CO Concentration (ppm)		
	Federal	**State**	**Predicted**	**Background**	**Total**	**Predicted**	**Background**	**Total**
Newport Boulevard @ 19th street								
AM Peak	**35**	**20**	7.0	5.8	12.8	4.7	5.8	10.5
PM Peak			7.9	5.8	13.7	7.6	5.8	13.4
Newport Boulevard @ 17th Street								
AM Peak	**35**	**20**	4.2	5.8	10.0	4.2	5.8	10.0
PM Peak			6.9	5.8	12.7	6.9	5.8	12.7

Note: Background concentrations are predicted CO concentrations for year 2020 as shown in the SCAQMD draft 2003 AQMP.

Table 9
Total Predicted Local 8-Hour CO Concentrations

	AAQS (ppm)		No Build 8-Hour CO Concentration (ppm)			Build 8-Hour CO Concentration (ppm)		
	Federal	**State**	**Predicted**	**Background**	**Total**	**Predicted**	**Background**	**Total**
Newport Boulevard @ 19th street								
AM Peak	**9**	**9**	4.9	4.7	9.6	3.3	4.7	8.0
PM Peak			5.6	4.7	10.3	5.3	4.7	10.0
Newport Boulevard @ 17th Street								
AM Peak	**9**	**9**	3.0	4.7	7.7	3.0	4.7	7.7
PM Peak			4.8	4.7	9.5	4.8	4.7	9.5

Note: Background concentrations are predicted CO concentrations for year 2020 as shown in the SCAQMD draft 2003 AQMP.

Although the results show that the 8-hour AAQS would still be exceeded in the Build Alternative, the concentrations are lower than for the No-Build Alternative. Therefore, the Build Alternative would aid in achieving CO attainment.

The qualitative PM_{10} hot spot analysis did not identify any issues that would result in an increase in the local PM_{10} concentrations. Therefore, PM_{10} emissions from the Project are not expected to result in PM_{10} concentrations beyond those expected in accordance with the 2002 RTIP, 2001 RTP, and SCAB SIP and AQMP.

Recently, concerns have been raised by the public regarding cancer risk associated with diesel exhaust emissions. Diesel exhaust is a complex mixture of gases and fine particles emitted by diesel-fired internal combustion engines. The gaseous fraction of diesel exhaust is composed of typical combustion gases such as nitrogen, oxygen, carbon dioxide, and water

vapor. However, as a result of incomplete combustion, the gaseous fraction also contains air pollutants such as carbon monoxide, sulfur oxides, nitrogen oxides, volatile organics, alkenes, aromatic hydrocarbons, and aldehydes such as formaldehyde, 1,3-butadiene and low-molecular weight polycyclic aromatic hydrocarbons (PAH) and PAH-derivatives. Based on the review of the cancer potencies of various TACs emitted from the combustion of diesel fuel, it is concluded that the cancer potential of the particulate matter fraction of diesel exhaust would constitute the maximum health risk.

Less than 5 percent of the vehicles traveling along this project area are diesel trucks. Although the project would not reduce the number of vehicles, it would reduce the idling time of these vehicles. Since diesel exhaust emissions would be highest when a vehicle is idling, this project would result in lower diesel exhaust emissions. This in turn would result in lower toxic risks in the area. It is expected that the traffic volumes in the area would increase 20 percent by the year 2025. Without the proposed project, the emissions and the toxic risk from vehicles in the area would only rise. This project will result in a lowering of the potential toxic risks in the area.

2.5 Mitigation Measures

2.5.1 Short-Term Construction Impact Mitigation

PM_{10} Control

Apply measures contained in Tables 1 and 2 of SCAQMD Rule 403. Control of particulate emissions from construction activities is best controlled through the requirements contained in SCAQMD's Rule 403. The information is reproduced here as Tables 10 and 11. The measures contained in these tables are presented as an option to air quality monitoring in Rule 403. Table 11 contains measures such as maintaining adequate moisture content in the soil, watering grading areas, establishing ground cover in inactive areas, and watering unpaved roads. Table 10 identifies additional measures that are applied during normal wind conditions. The mitigation measure, therefore, is to require utilization of the measures contained in Tables 1 and 2 of Rule 403. This potentially results in a much higher reduction of particulate emissions than if the air monitoring option contained in Rule 403 was employed. The construction contractors, would be required to obtain construction permits from the City of Costa Mesa and Caltrans. The City of Costa Mesa would be responsible for overseeing compliance with Rule 403 by the contractor.

Construction Equipment Emission Control

While the above PM_{10} control measures address particulate emissions from construction activities, other pollutants generated by construction equipment will also contribute to PM_{10} emission thresholds. The generation of these emissions would be almost entirely due to engine combustion in construction equipment and employee commuting. The measure below addresses these emissions.

Reduce construction equipment emissions by implementing the following measures. The following measures should be implemented when feasible. They should be included in improvement plans specifications for implementation by contractors.

- Use low-emission mobile construction equipment.

- Maintain construction equipment engines by keeping them tuned.
- Use low-sulfur fuel for stationary construction equipment. This is required by SCAQMD Rules 431.1 and 431.2.
- Utilize existing power sources (i.e., power poles) when feasible. This measure would minimize the use of higher-polluting gas or diesel generators.
- Configure construction parking to minimize traffic interference.
- Minimize obstruction of through-traffic lanes. When feasible, construction should be planned so that lane closures on existing streets are kept to a minimum.
- Schedule construction operations affecting traffic for off-peak hours.
- Develop a traffic plan to minimize traffic flow interference from construction activities (the plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service).
- Develop a "Diesel Fuel Reduction Plan" that identifies the actions to be taken to reduce diesel fuel emissions during construction activities (inclusive of grading and excavation activities). Reductions in diesel fuel can be achieved by measures including, but not limited to the following: a) use of alternative energy sources, such as compressed natural gas or liquefied petroleum gas, in mobile equipment and vehicles; b) use of "retrofit technology," including diesel particulate trips, on existing diesel engines and vehicles; c) other appropriate measures. Prior to the issuance of a grading permit, the Diesel Fuel Reduction Plan shall be filed with the City of Costa Mesa Planning Division.

Table 10
SCAQMD Rule 403 – Control Measures for Normal Wind Conditions

Source	Control Measure
Earthmoving (construction and filling area)	Maintain soil moisture content at a minimum of 12 percent, or earthmoving that is more than 100 feet from all property, watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earthmoving (construction fill areas)	Maintain soil moisture content at a minimum of 12 percent. For areas that have optimum moisture content for compaction of less than 12 percent, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content.
Earthmoving (construction cut areas)	Conduct watering as necessary to prevent visible emissions extending more than 100 feet beyond the active cut area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed Surface Areas (except completed stabilized grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas that cannot be stabilized, as evidenced by wind-driven fugitive dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.

Table 10
SCAQMD Rule 403 – Control Measures for Normal Wind Conditions

Source	Control Measure
Disturbed Surface Areas	Apply chemical stabilizers within 5 working days of grading completion; or apply water to at least 80 percent of all inactive surface areas on a daily basis when there is evidence of wind-driven fugitive dust, except any areas that are inaccessible to watering vehicles due to excessive slope or other safety conditions; or establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter.
Inactive Disturbed Surface Areas	Apply water to at least 80 percent of all inactive disturbed areas on a daily basis when there is evidence of wind-driven fugitive dust, except any areas that are inaccessible to watering vehicles due to excessive slope or other safety conditions; or apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; or establish a vegetative ground cover within 21 days after active operations have ceased (ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter); or utilize any combination of the above three measures such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every 2 hours of active operations; or water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 mph; or apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open Storage Piles	Apply chemical stabilizers; or apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust; or install temporary coverings; or install a three-sided enclosure with walls with no more than 50 percent porosity that extend, at a minimum, to the top of the pile.

Table 11
SCAQMD Rule 403 – Dust Control Actions for Exemption from Paragraph (d)(4)

Fugitive Dust Source Category		Control Action
Earthmoving (except construction cutting and filling areas, and mining operations)	(1a)	Maintain soil moisture content at a minimum of 12 percent, as determined by American Society for Testing and Materials (ASTM) method D-2216, or other equivalent method approved by the Executive Officer, CARB, and EPA. Two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and two such evaluations each subsequent 4-hour period of active operations; OR
	(1a-1)	For any earthmoving that is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.

Table 11
SCAQMD Rule 403 – Dust Control Actions for Exemption from Paragraph (d)(4)

Fugitive Dust Source Category		Control Action
Earthmoving (construction fill areas)	(1b)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, CARB, and EPA. For areas that have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer, CARB, and EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and two such evaluations during each subsequent 4-hour period of active operations.
Earthmoving (construction cut areas and mining operations)	(1c)	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	(2a/b)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas that cannot be stabilized, as evidenced by wind-driven fugitive dust, must have an application of water at least twice per day to at least 80 [70] percent of the unstabilized area.
Disturbed surface areas (completed grading areas)	(2c)	Apply chemical stabilizers within 5 working days of grading completion; OR
	(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(3a)	Apply water to at least 80 [70] percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	(3b)	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	(3c)	Establish a vegetative ground cover within 21 [30] days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	(3d)	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	(4a)	Water all roads used for any vehicular traffic at least once per every 2 hours of active operations [3 times per normal 8-hour work day]; OR
	(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 mph; OR
	(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a)	Apply chemical stabilizers; OR
	(5b)	Apply water to at least 80 [70] percent of the surface area of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust; OR

Table 11
SCAQMD Rule 403 – Dust Control Actions for Exemption from Paragraph (d)(4)

Fugitive Dust Source Category		Control Action
	(5c)	Install temporary coverings; OR
	(5d)	Install a three-sided enclosure with walls with no more than 50 percent porosity extending, at a minimum, to the top of the pile.
All Categories	(6a)	Any other control measures approved by the Executive Officer and EPA as equivalent to the methods specified in Table 2 may be used.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the SCAB.

2.5.2 Long-Term Impacts

Regional Emissions

The Project conforms with the State's 2001 RTP; therefore, the Project is not expected to result in a significant regional air quality impact. No mitigation is required.

Local Air Quality Impacts

Operational CO and PM_{10} concentrations are found to be insignificant; therefore, the Project is not expected to result in long-term local air quality impacts.

2.6 Mitigation Monitoring Program

Table 12 shows the proposed mitigation monitoring program. The proposed mitigation measures would reduce both Project-related and cumulative air quality impacts.

Table 12
Mitigation Monitoring Program

Potentially Adverse Impacts	Mitigation Measures	Significance after Mitigation	Mitigation Responsibility	Frequency
AQ-1: Project construction would cause emissions of CO, oxides of nitrogen (NO_X), PM_{10}, and reactive organic gases (ROG).	All equipment shall be properly tuned and maintained in accordance with manufacturer's specifications. Construction contractors shall maintain and operate construction equipment to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading queues must be kept with their engines off when not in use to reduce vehicle emissions. Construction emissions shall be phased and scheduled to avoid emissions peaks, where feasible, and discontinued during second-stage smog alerts. Construction contractor shall prepare and implement a "Diesel Fuel Reduction Plan."	Less than significant	City of Costa Mesa	During construction

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Appendix A
Detailed Emission Calculations

Table 1
Construction Motor Vehicle Emission Factors[a]

Vehicle Type	Vehicle Class	Vehicle Weight (tons)	Road Type	Silt loading (g/m^2)[c]	Speed (mph)	CO	
						Exhaust g/mi	Start-Up[d] g/trip
Onsite Pickup Truck	Light duty truck, catalyst, gasoline	3	Local	0.24	5	22.65	31.36
Onsite Dump Truck	Heavy heavy-duty truck, diesel	40	N/A	N/A	5	15.21	0.00
Offsite Construction Commuter	Light duty truck, catalyst, gasoline	3	Collector	0.037	35	10.37	31.36
Offsite Miscellaneous Noncommute	Light duty truck, catalyst, gasoline	3	Collector	0.037	35	10.37	31.36
Offsite Delivery/Haul Truck	Heavy heavy-duty truck, diesel	40	Collector	0.037	35	3.24	0.00

Vehicle Type	ROG					
	Exhaust g/mi	Start-Up[d] g/trip	Hot Soak g/trip	Resting g/hr	Evap. Running g/mi	Diurnal g/hr
Onsite Pickup Truck	1.47	2.59	0.40	0.17	8.67	0.44
Onsite Dump Truck	2.57	0.00	0.00	0.00	0.00	0.00
Offsite Construction Commuter	0.29	2.59	0.40	0.17	1.24	0.44
Offsite Miscellaneous Noncommute	0.29	2.59	0.40	0.17	1.24	0.44
Offsite Delivery/Haul Truck	0.84	0.00	0.00	0.00	0.00	0.00

* ROG emissions are taken using VOC emission factors

Vehicle Type	NOx		PM_{10}				
	Exhaust g/mi	Start-Up[d] g/trip	Exhaust g/mi	Start-Up[d] g/trip	Tire Wear g/mi	Brake Wear g/mi	Paved Road Dust[b] g/mi
Onsite Pickup Truck	1.81	0.99	0.06	0.02	0.01	0.01	1.56
Onsite Dump Truck	28.30	0.00	1.51	0.00	0.04	0.01	0.00
Offsite Construction Commuter	0.97	0.99	0.01	0.02	0.01	0.01	0.46
Offsite Miscellaneous Noncommute	0.97	0.99	0.01	0.02	0.01	0.01	0.46
Offsite Delivery/Haul Truck	15.72	0.00	0.49	0.00	0.04	0.01	0.46

[a] All except paved road dust from ARB EMFAC2000 motor vehicle emission factor model, version 2.02, for calendar year 2002, summertime

[b] Emission factor [g/mi] = 7.26 (Silt Loading/2)$^{0.65}$ (Fleet Average Vehicle Weight/3)$^{1.5}$, from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997). SIlt loadings and fleet average vehicle weight (2.4 tons) are from ARB Emissions Inventory Methodology.

Table 2
Construction Equipment Emission Factors

Onsite Equipment	Fuel Type	Rating (hp)	Load Factor (%)[b]	Emission Factor (lb/bhp-hr)[a]					Emission Rate (lb/hr)				
				CO	ROG	NO_X	SO_X	PM_{10}	CO	ROG	NO_X	SO_X	PM_{10}
Bulldozer	diesel	300	59	0.0187	0.0022	0.0152	0.0004	0.0009	3.32	0.39	2.69	0.06	0.16
Backhoe/Front End Loader	diesel	300	48	0.0187	0.0022	0.0152	0.0004	0.0009	2.70	0.32	2.19	0.05	0.13
Rubber Tired Crane	diesel	500	43	0.0187	0.0022	0.0152	0.0004	0.0009	4.03	0.47	3.27	0.08	0.19
Cherry Picker Hydraulic Crane	diesel	500	43	0.0187	0.0022	0.0152	0.0004	0.0009	4.03	0.47	3.27	0.08	0.19
Concrete Vibrator	electric	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welding Machine	electric	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Grinder	electric	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compressor, 250 cfm	diesel	80	48	0.0187	0.0022	0.0152	0.0004	0.0009	0.72	0.08	0.58	0.01	0.03
Tractor/Loader/Backhoe, 1/2 CY	diesel	80	46.5	0.0187	0.0022	0.0152	0.0004	0.0009	0.70	0.08	0.57	0.01	0.03
Crane, 5 ton	diesel	62	43	0.0090	0.0030	0.0152	0.0004	0.0015	0.24	0.08	0.41	0.01	0.04
Welder	diesel	35	45	0.0110	0.0020	0.0152	0.0004	0.0010	0.17	0.03	0.24	0.01	0.02
Vibratory Compactor	diesel	70	57.5	0.0070	0.0020	0.0152	0.0004	0.0010	0.28	0.08	0.61	0.01	0.04
Roller, 5 ton	diesel	70	57.5	0.0070	0.0020	0.0152	0.0004	0.0010	0.28	0.08	0.61	0.01	0.04
Dump Truck	diesel	3.75	100.00	0.0335	0.0057	0.0152	0.0004	0.0033	0.13	0.02	0.06	0.00	0.01
Grinder	diesel	56	73.00	0.0200	0.0240	0.0152	0.0004	0.0010	0.82	0.98	0.62	0.01	0.04
Jackhammer	electric	N/A	N/A	0.0000	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00

* ROG emissions are taken as VOC

[a] Federal 1996+ year emission standards for > 75 hp, California NO_X emission standard for all, 500 ppm sulfur content for SO_X, South Coast CEQA Air Quality Handbook, Table A9-8-B for all others

[b] South Coast CEQA Air Quality Handbook, Table A9-8-D

Table 3
Fugitive PM10 Emission Factors

Bulldozing

Emission Factor [lb/hr] = 0.75 x (silt content [%])$^{1.5}$ / (moisture)$^{1.4}$
Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD 1993 CEQA Air Quality Handbook, Overburden
Moisture	5.9	"Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.

Emission Factor (Uncontrolled)	1.284	lb/hr
Reduction from Watering Twice/Day	50%	
Controlled Emission Factor	0.642	lb/hr

Motor Vehicles and Equipment on Unpaved Surfaces

Emission Factor [lb/mi] = 2.6 x (vehicle speed [mph] / 15) x (silt content [%] / 12) $^{0.8}$ x (vehicle weight [tons] / 3)$^{0.4}$ / (moisture [%] / 0.2)$^{0.3}$
Reference: AP-42, Section 13.2.2, September 1998

Parameter	Value	Basis
Silt Content	15	SCAQMD 1993 CEQA Air Quality Handbook, Overburden
Moisture	3	"Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.
Vehicle Weight	40	Assumption
Vehicle Speed	5	Typical value

Emission Factor (Uncontrolled)	1.296	lb/mi
Reduction from Watering Twice/Day	50%	
Controlled Emission Factor	0.648	lb/mi

Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
Reference: Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures,
EPA, September 1992

Parameter	Value	Basis
Silt Content	15	SCAQMD 1993 CEQA Air Quality Handbook, Overburden
Pct. time wind > 12 mph	100	Assumption

Emission Factor (Uncontrolled)	88.0	lb/day-acre
Reduction from Watering Twice/Day	50%	
Controlled Emission Factor	44.0	lb/day-acre

Table 4
Construction Motor Vehicle Emissions

Vehicle Type	Miles/ Vehicle-Day	Starts/ Vehicle-Day	CO (lbs/ vehicle-day)	ROG (lbs/ vehicle-day)	NO_X (lbs/ vehicle-day)	SO_X (lbs/ vehicle-day)	PM_{10} (lbs/ vehicle-day)
Construction Commuter	40	2	1.05	0.17	0.09	0.00	0.04
Delivery/Haul Truck	40	2	0.29	0.07	1.39	0.00	0.09

Table 5
Motor Vehicle Usage During Construction

Vehicle Type	Number per Day						
	Mob.	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Construction Commuter	5	5	5	5	5	5	5
Delivery/Haul Truck		2	2	2	2	1	2

* Based on 8 hour work day.

Table 6
Estimated Construction Emissions

	CO	ROG	NOX	SOX	PM10
Mobilization					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.00	0.00	0.00	0.00	0.00
Other: None	0.00	0.00	0.00	0.00	0.00
pounds per day	5.26	0.84	0.45	0.00	0.22
pounds per stage	52.63	8.41	4.50	0.00	2.19
Stage 1					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.57	0.15	2.77	0.00	0.18
Other: Tractor (2)	11.15	1.31	9.05	0.21	0.52
pounds per day	16.99	2.30	12.28	0.21	0.92
pounds per stage	84.93	11.51	61.38	1.05	4.60
Stage 2					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.57	0.15	2.77	0.00	0.18
Other: None	0.00	0.00	0.00	0.00	0.00
pounds per day	5.83	0.99	3.22	0.00	0.40
pounds per stage	58.33	9.89	32.23	0.00	3.96
Stage 3					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.57	0.15	2.77	0.00	0.18
Fugitive Dust (40 miles)	0.00	0.00	0.00	0.00	25.92
Other: Grinder (2)	13.08	15.70	9.95	0.23	0.65
pounds per day	18.91	16.69	13.17	0.23	26.97
pounds per stage	94.57	83.43	65.86	1.15	134.83
Stage 4					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.57	0.15	2.77	0.00	0.18
Fugitive Dust (40 miles)	0.00	0.00	0.00	0.00	25.92
Other: Rollers (2)	4.51	1.29	9.80	0.23	0.64
pounds per day	10.34	2.28	13.02	0.23	26.96
pounds per stage	51.71	11.38	65.10	1.14	134.78
Stage 5					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.29	0.07	1.39	0.00	0.09
Other: None	0.00	0.00	0.00	0.00	0.00
pounds per day	5.55	0.92	1.84	0.00	0.31
pounds per stage	27.74	4.58	9.18	0.00	1.54
Stage 6					
Construction Commuter	5.26	0.84	0.45	0.00	0.22
Delivery/Haul Truck	0.57	0.15	2.77	0.00	0.18
Other: None	0.00	0.00	0.00	0.00	0.00
pounds per day	5.83	0.99	3.22	0.00	0.40
pounds per stage	116.66	19.78	64.46	0.00	7.92
Overall Total					
Total pounds	486.57	148.98	302.71	3.34	289.82
Max pounds per day	18.91	16.69	13.17	0.23	26.97

Appendix B
Final 2002 RTIP

FINAL 2002 REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM (RTIP) (FY 2002/2003-2007/2008) – STATE HIGHWAY PROJECTS[1]

ORANGE COUNTY

LEAD AGENCY	PROJECT ID	AIR BASIN	MODEL NO	PROGRAM CODE	RTE	POST MILES BEG	POST MILES END	DESCRIPTION	FUND	YEAR	ENG	ROW	CONS	TOTAL	2002/03	2003/04	2004/05	2005/06-2007/08	PROJECT TOTAL	CONFORMITY CATEGORY
GARDEN GROVE	ORA981104	SCAB	O263	CAR63	22	7.8	.0	RECONSTRUCT HARBOR BLVD INTERCHANGE. 4 LANES EACH DIRECTION. (1/4 MILE BEFORE AND AFTER SR-22 RAMPS) 2 HOV LNES(1 E/B & 1 W/B) AND PROPOSED SR-22 HOV LANES.	DEMOT21	02/03	390	0	0	390	3159	5325	0	.0	8484	TCM
									CITY	02/03	104	0	1100	1204						
									LTF	02/03	0	275	1290	1565						
									DEMOT21	03/04	0	0	1110	1110						
									LTF	03/04	0	0	1300	1300						
									ORA-GMA	03/04	0	0	300	300						
									ORA-RIP	03/04	0	0	2615	2615						
ORANGE, CITY OF	ORA55282	SCAB	2401	CARH3	22	9.7	.0	BUILD NEW RAMP FROM THE SR-57 TO THE SR22 WEST BOUND (INCLS WIDENING OF LEWIS ST BRIDGE FROM LAMPSON TO GARDEN GROVE BL) & BUILD OFFRAMP FROM THE SR-57 DIRECTLY TO THE CITY DRIVE.	CITY	03/04	700	0	0	700	0	700	2059	.0	2759	<OTHER>
									CITY	04/05	0	0	2059	2059						
ORANGE, CITY OF	ORA990443	SCAB	O264	CARH3	22	10.5	.0	SR-22 AND CITY DRIVE INTERCHANGE IMPROVEMENTS. RECONFIGURE FREEWAY INTERCHANGE AT SR-22 FROM SR-57 TO LEWIS STREET -- FROM 6/0 TO 6/2 LANES (ADDING 2 HOV LANES)	CITY	02/03	0	1600	0	1600	1600	24791	0	.0	26391	TCM
									CITY	03/04	1650	0	20832	22482						
									ORA-GMA	03/04	0	0	250	250						
									ORA-RIP	03/04	0	0	1636	1636						
									PVT	03/04	0	0	423	423						
HUNTINGTON BEACH	ORA000149	SCAB		NCRH1	39	5.7	5.7	BEACH BLVD @ EDINGER. WIDEN S/E CORNER TO CONSTRUCT NB RT-TURN LANE TO EDINGER. 3 LANES TO 3 LANES.	ORA-IIP	02/03	0	0	418	418	418	0	0	.0	418	EXEMPT/TRAFFIC SIGNALIZATION
COSTA MESA	ORA000161	SCAB	O205	CAR63	55	1.5	2.0	NEWPORT BLVD. (SR-55 TO 17TH ST) - WIDENING FROM 6 TO 8 THROUGH LANES. WIDEN 1 LANE N/B FROM 17TH TO 19TH AND 1 LANE S/B FROM 19TH TO BROADWAY	STPL-R	02/03	320	0	0	320	860	0	0	.0	860	<OTHER>
									ORA-GMA	02/03	60	15	465	540						
COSTA MESA	ORA015	SCAB		NCRH1	55	5.3	5.3	BAKER STREET AND SR-55; N/B & S/B FRONTAGE ROAD IMPROVEMENTS. S/B FREE RIGHT TURN, N/B LEFT-TURN AND 2ND E/B LEFT.	CITY	03/04	90	0	610	700	0	700	0	.0	700	EXEMPT/TRAFFIC SIGNALIZATION
COSTA MESA	ORA016	SCAB	O265	NCRH1	55	5.8	5.8	PAULARINO AVE (SR-55 @ PAULARINO AVE) IN COSTA MESA INTERSECTION IMPROVEMENT. ADDING A N/B RAMP AND W/B RIGHT-TURN-LANE.	CITY	03/04	40	150	0	190	0	190	248	.0	438	EXEMPT/TRAFFIC SIGNALIZATION
									CITY	04/05	0	0	248	248						
COSTA MESA	ORA017	SCAB		NCRH1	55	5.8	5.8	PAULARINO AVE IN COSTA MESA. INTERSECTION IMPROVEMENT ADD S/B RIGHT-TURN LANE.	CITY	03/04	42	0	0	42	0	42	200	.0	242	EXEMPT/TRAFFIC SIGNALIZATION
									CITY	04/05	0	0	200	200						
SANTA ANA	550	SCAB	2204	CAR63	55	7.5	7.6	ALTON AVE IN SANTA ANA CONSTRUCT A NEW 4-LANE (2E/B AND 2W/B) OVERCROSSING & HOV ACCESS RAMPS @SR-55	CITY	02/03	1820	0	0	1820	3500	1500	1500	36600.0	43100	<OTHER>
									ORA-RIP	02/03	1680	0	0	1680						
									CITY	03/04	0	1500	0	1500						
									CITY	04/05	0	1500	0	1500						
									CITY	05/06	0	0	36600	36600						
TUSTIN	ORA55261	SCAB	O266	CARH3	55	9.0	9.4	NEWPORT AVENUE@ SR 55 INTERCHANGE MODIFY NORTHBOUND ROUTE 55 ON AND OFF RAMPS TO CONNECT TO NEWPORT AVE EXTENSION (frm 0 TO 6 LNS) (BTWN EDINGER & VALENCIA) (00-TUST-RIP-3190)	CITY	02/03	0	0	4282	4282	6345	0	0	.0	6345	<OTHER>
									ORA-RIP	02/03	0	0	2063	2063						

Note 1. Sorted by county, route, post miles, and project ID.