4.3 AIR QUALITY

An air quality assessment was prepared by Giroux & Associates to evaluate the potential project-related air and climate change/greenhouse gas impacts anticipated to occur as a result of the proposed project. The analysis in the following section focuses on the existing conditions in the study area, thresholds of significance, the potential short- and long-term impacts of the proposed street improvement project related to the air quality and climate change/greenhouse gas emissions, and mitigation as needed. The Air Quality Assessment prepared by Giroux & Associates is included in Appendix D; the findings and recommendations of that analysis are summarized below.

4.3.1 Existing Conditions

Climate/Meteorology

The Saddleback Valley's climate, as with all of Southern California, is dominated by the strength and position of the semi-permanent high-pressure center over the Pacific Ocean near Hawaii. It creates cool summers, mild winters, infrequent rainfall, cool daytime sea breezes, comfortable humidity levels and ample sunshine. Unfortunately, the same atmospheric processes that create the desirable living climate combine to restrict the ability of the atmosphere to disperse the air pollution generated by the large population attracted in part by the comfortable climate. Portions of the Los Angeles Basin therefore experience some of the worst air quality in the nation for certain pollutants.

Temperatures in Dana Point average 62°F annually. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby oceanic heat reservoir. In contrast to the steady temperature regime, rainfall is highly variable, and confined almost exclusively to the "rainy" period from early November to mid-April. Rainfall in the project area averages about 12 inches annually with January typically being the wettest month of the year.

Winds near the project site, based on long-term monitoring from the former MCAS El Toro, display several characteristic patterns. During the day, especially in summer, winds are from the west at 7 – 9 miles per hour. At night, especially in winter, the land becomes cooler than the ocean and an offshore wind of 3-5 miles per hour develops. After sunrise, the wind direction rotates through the southeast and south at 5-7 miles per hour until the west wind again becomes dominant in the early afternoon. One other important wind pattern occurs when a high pressure center forms over the western United States and creates strong, hot, dry, gusty, Santa Ana winds from the northeast and east across Orange County.

The net effect of the area wind pattern is that any locally generated air pollutant emissions will be carried from east to west at night and then reverse from west to east by day. Although the daytime wind-speeds are generally stronger and therefore better ventilate the project area, the offshore flow, once well-organized late in the evening and during the night, is also strong enough to minimize any significant localized air stagnation. The least ventilated period is typically during the morning and evening transition when winds become near calm until the new flow component becomes fully established.

In addition to winds that govern the horizontal rate and trajectory of any air pollutants, Southern California experiences several characteristic temperature inversions that control the vertical depth through which pollutants can be mixed. The daytime onshore flow of marine air is capped by a massive dome of warm air that acts like a giant lid over the basin. As the clean ocean air moves inland, pollutants are continually added from below without any dilution from above. As this layer slows down in inland valleys of the basin and undergoes photochemical transformations under abundant sunlight, it creates very unhealthful levels of smog (mainly ozone).

A second inversion forms at night as cool air pools in low elevations while the air aloft remains warm. Shallow radiation inversions are formed (especially in winter) that trap pollutants near intensive traffic sources such as freeways, shopping centers, etc., and form localized violations of clean air standards called "hot spots." Although inversions are found during all seasons of the year, the regional capping inversion is far more prevalent in summer while the localized radiation inversions are strongest in winter. The strong seasonal split in inversion intensity thus contributes significantly to the completely different air quality climate found in summer in the project vicinity than in winter. Because traffic concentrations in the project area are only moderate, and because individual cars are becoming progressively "cleaner," air quality concerns in the project area are more centered on the regional, summertime intrusion of photochemical smog (ozone) rather than on any winter micro-scale stagnation conditions.

Ambient Air Quality Standards

The Federal Clean Air Act (FCAA) was passed in 1963 by the U.S. Congress and has been amended several times. The 1970 Clean Air Act Amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including non-attainment requirements for areas not meeting AAQS and the Prevention of Significant Deterioration program. The 1990 Amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The FCAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the state AAQS by the earliest practical date. The State AAQS tend to be more restrictive than the federal AAQS and are based on even greater health and welfare concerns.

The AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect sensitive receptors, those most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both the State of California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 4.3-1, these pollutants are O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 4.3-1

State and Federal Ambient Air Quality Standards for Criteria Pollutants
Pacific Coast Highway/Del Prado Avenue Phase I Street Improvement Project

Air Pollutant	Averaging Time	California Standards[1,2]	Federal Primary Standards[2,3,4]	Federal Secondary Standards[3,5]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	--	Same as Primary
	8-Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	--	Same as Primary
	24 Hours	No Separate Standard	35 µg/m^3	

Air Pollutant	Averaging Time	California Standards[1,2]	Federal Primary Standards[2,3,4]	Federal Secondary Standards[3,5]
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	Same as Primary
	24 Hours	--	35 µg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm	None
	8-Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
	1-Hour	0.18 ppm (339 µg/m^3)	0.100 ppm[6]	None
Lead (Pb)	30-day Average	1.5 µg/m^3	--	--
	Calendar Quarter	--	1.5 µg/m^3	Same as Primary
	Rolling 3-Month Average[7]	--	1.5 µg/m^3	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	0.03 ppm (80 µg/m^3)	--
	24 Hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	3 Hours	--	--	0.05 ppm (1,300 µg/m3)
	1 Hour	--	--	--
Sulfates	24 Hour	25 µg/m^3	No Federal Standards	
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride[8]	24 Hour	0.01 ppm (26 µg/m^3)		

[1]California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter (PM_{10} and $PM_{2.5}$), and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2]Concentration expressed firs in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[3]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 µg/m^3 is equal to or less than 1. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

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

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

[6]To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

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

Air Pollutant	Averaging Time	California Standards[1,2]	Federal Primary Standards[2,3,4]	Federal Secondary Standards[3,5]

[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.

ppm - parts per million
$\mu g/m^3$ - micrograms per cubic meter

SOURCE: California Air Resources Board (2009)

Air Quality Management Planning

The Federal Clean Air Act (1977 Amendments) required that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards. The SCAB could not meet the deadlines for ozone, nitrogen dioxide, carbon monoxide, or PM-10. In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and revised it several times as earlier attainment forecasts were shown to be overly optimistic.

The 1990 Federal Clean Air Act Amendment (CAAA) required that all states with air-sheds with "serious" or worse ozone problems submit a revision to the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised and approved over the past decade. The most current regional attainment emissions forecast for ozone precursors (ROG and NOx) and for carbon monoxide (CO) and for particulate matter are shown in Table 4.3-2. Substantial reductions in emissions of ROG, NOx and CO are forecast to continue throughout the next several decades. Unless new particulate control programs are implemented, PM_{10} and $PM_{2.5}$ are forecast to slightly increase.

Table 4.3-2

South Coast Air Basin Emissions Forecasts
(Emissions in Tons/Day)

Pollutant	2005[1]	2010[2]	2015[2]	2020[2]
Oxides of Nitrogen (NOx)	985	742	580	468
Reactive Organic Gases (ROG)	735	576	536	505
Carbon Monoxide (CO)	4,1254	2,950	2,476	2,203
Particulate Matter (PM_{10})	281	286	297	307
Particulate Matter ($PM_{2.5}$)	103	102	102	103

12005 Base year
2With current emissions reduction programs and adopted growth forecasts.

SOURCE: Giroux & Associates (2010)
California Air Resources Board (2009 California Almanac of Emission & Air Quality)

The Air Quality Management District (AQMD) adopted an updated clean air "blueprint" in August 2003. The 2003 AQMP was approved by the EPA in 2004. The Air Quality Management Plan (AQMP) outlined the air pollution measures needed to meet federal health-based standards for ozone by 2010 and for particulates (PM_{10}) by 2006. The 2003 AQMP was based upon the federal 1-hour ozone standard, which was revoked late in 2005 and replaced by an 8-hour federal standard. Because of the revocation of the hourly standard, a new air quality planning cycle was initiated.

With re-designation of the air basin as non-attainment for the 8-hour ozone standard, a new attainment plan was developed. This plan shifted most of the one-hour ozone standard attainment strategies to the 8-hour standard. As previously noted, the attainment date will "slip" from 2010 to 2021. The updated attainment plan also includes strategies for ultimately meeting the federal $PM_{2.5}$ standard.

Because projected attainment by 2021 requires control technologies that do not exist yet, the SCAQMD has requested a voluntary "bump-up" from a "severe non-attainment" area to an "extreme non-attainment" designation for ozone. An extreme designation would allow a longer time period for these technologies to develop. If attainment cannot be demonstrated within the specified deadline without relying on "black-box" measures, EPA would be required to impose sanctions on the region. With an anticipated further strengthening of the federal eight-hour ozone standard, action on the bump-up request may be delayed until possible new standards are finalized. If/when that happens, new planning deadlines will be adopted.

The currently applicable AQMP was adopted in June 2007, after extensive public review. The 2007 AQMP recognizes the interaction between photochemical processes that create both ozone and the smallest airborne particulates ($PM_{2.5}$). The 2007 AQMP is therefore a coordinated plan for both pollutants. Key emissions reductions strategies in the updated air quality plan include:

- Ultra-low emissions standards for both new and existing sources (including on-and-off-road heavy trucks, industrial and service equipment, locomotives, ships and aircraft).
- Accelerated fleet turnover to achieve benefits of cleaner engines.
- Reformulation of consumer products.
- Modernization and technology advancements from stationary sources (refineries, power plants, etc.)

Projects such as the proposed PCH/Del Prado Avenue Street Improvement project do not directly relate to the AQMP in that there are no specific air quality programs or regulations governing transportation system improvement projects. If a proposed project is consistent with the local transportation master plan, it will not induce patterns of growth not already anticipated in the AQMP. The SCAQMD, however, while acknowledging that the AQMP is a growth-accommodating document, does not favor designating regional impacts as less-than-significant just because the proposed development is consistent with regional growth projections. Air quality impact significance for the proposed project has therefore been analyzed on a project-specific basis.

Area Designations

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the State Implementation Plan (SIP). Areas are classified as attainment non-attainment areas for particular pollutants, depending on whether they meet ambient air quality standards for that pollutant. Severity classifications for ozone non-attainment range in magnitude from marginal, moderate, and serious to severe and extreme. Attainment classifications apply to individual pollutants:

- ***Unclassified:*** the data are incomplete and do not support a designation of attainment or non-attainment for a pollutant

- ***Attainment:*** the CAAQS was not violated at any site in the area during a three-year period for that pollutant
- ***Non-attainment:*** there was at least one violation of a state AAQS for that pollutant in the area
- ***Non-attainment/Transitional:*** a subcategory of the non-attainment designation; signifies that the area is close to attaining the AAQS for that pollutant

The attainment status for the SCAB is shown in Table 4.3-3. The SCAB is also designated as attainment of the CAAQS for SO_2, lead, and sulfates. According to the 2007 AQMP, the SCAB will have to meet the new federal $PM_{2.5}$ standards by 2015 and the eight-hour ozone standard by 2024, and will most likely have to achieve the recently revised 24-hour $PM_{2.5}$ standard by 2020.

Table 4.3-3

Attainment Status
South Coast Air Basin

Air Pollutant	State Status	Federal Status
Ozone – 1-Hour	Extreme Non-attainment	Revoked June 2005
Ozone – 8-Hour	Extreme Non-attainment	Non-attainment
PM_{10}	Serious Non-attainment	Non-attainment Annual Standard Revised September 2006
$PM_{2.5}$	Non-attainment	Non-attainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
All Others	Attainment/Unclassified	Attainment/Unclassified

SOURCE: California Air Resources Board (2007)

With re-designation of the air basin as non-attainment for the 8-hour ozone standard, a new attainment plan was developed. This plan shifted most of the 1-hour ozone standard attainment strategies to the 8-hour standard. As previously noted, the attainment date will "slip" from 2010 to 2021. The updated attainment plan also includes strategies for ultimately meeting the federal $PM_{2.5}$ standard.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods, resulting in sustained exposure. Recreational land uses are considered moderately sensitive to air pollution, because although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In

addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution as exposure periods are relatively short and intermittent and the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the general public.

Baseline Air Quality

Existing and probable future levels of air quality in the project area can be best inferred from ambient air quality measurements conducted by the SCAQMD at its Mission Viejo monitoring station.[1] Monitoring at this station includes both regional pollutants such as dust and smog, as well as primary vehicular pollutants such as carbon monoxide. Table 4.3-4 summarizes the last seven years of published data from this monitoring station.

Table 4.3-4

Ambient Air Quality Data (2002 – 2008)
Number of Days Standards Exceeded and Maximum Levels During Violations

Pollutant/Standard	2002	2003	2004	2005	2006	2007	2008
Ozone							
1-Hour > 0.09 ppm (State)	9	16	11	3	13	5	9
1-Hour > 0.12 ppm (Federal)[1]	2	4	0	1	0	N/A	N/A
8-Hour > 0.07 ppm (State)	14	27	32	10	23	10	25
8-Hour >0.075 ppm (Federal)	1	8	4	1	6	5	15
Max. 1-Hour Concentration (ppm)	0.14	0.15	0.12	0.12	0.12	0.11	0.12
Max. *-Hour Concentration (ppm)	0.093	0.105	0.090	0.085	0.105	0.090	0.104
Carbon Monoxide							
1-Hour > 20 ppm (State)	0	0	0	0	0	0	0
8-Hour > 9 ppm (State/Federal)	0	0	0	0	0	0	0
Max. 1-Hour Concentration (ppm)	3.4	2.5	2.0	2.0	2.0	3.0	2.0
Max. 8-Hour concentration (ppm)	1.9	1.6	1.6	1.6	1.8	2.1	1.1
Inhalable Particulates (PM_{10})							
24-Hour > 50 µg/m^3 (State)	5/60	2/57	0/57	0/55	1/50	3/58	0/55
24-Hour > 150 µg/m^3 (Federal)	0/60	0/57	0/57	0/55	0/50	0/58	0/55
Max. 24-Hour concentration (µg/m^3)	80.0	64.0	47.0	31.0	57.0	74.0	42.0
Ultra-Fine Particulates ($PM_{2.5}$)							
24-Hour > 65 µg/m^3 (State)	0/119	0/109	0.111	0.114	0.106	0.98	0.120
24-Hour > 35 µg/m^3 (Federal)[2]	4/119	3/109	3/111	0.114	1.106	2/98	0/120
Max. 24-Hour concentration (µg/m^3)	58.0	51.0	49.0	35.0	47.0	47.0	33.0

NOTE: Entries shown as ratios = samples exceeding standard/samples taken.

[1]Standard revoked in 2006.
[2]Revised Standard adopted in 2006.

SOURCE: SCAQMD, Mission Viejo Monitoring Station (Preliminary 2008 data)

[1]The SCAQMD Mission Viejo monitoring station is located at 26081 Via Para. (This station was previously located for many years in El Toro.)

Although the entire spectrum of air pollutants is not monitored at the Mission Viejo station, the following conclusions can be drawn from this data:

- Photochemical smog (i.e., ozone) levels occasionally exceed standards. The former Federal one-hour standard has been exceeded only 7 times within the last five years of data, while the new 8-hour state ozone standard has been exceeded an average of 20 times a year in the past seven years. The 1-hour state standard has been violated an average of 9 times per year for the last seven years (3 percent of all days) near Mission Viejo. Years 2005 and 2007 were the cleanest years of recent years; however the frequency of violations rose in subsequent years. While ozone levels are still high, they are much lower than 10 to 20 years ago. For several years, El Toro had the worst smog of any station in Orange County. In the last several years, however, Mission Viejo, and by inference all of South Orange County, had some of the lowest smog readings on record.

- Measurements of carbon monoxide have shown very low baseline levels in comparison to the most stringent 1- and 8-hour standards.

- Respirable dust (PM_{10}) levels periodically exceed the state standard, but the less stringent federal PM_{10} standard has never been violated since PM_{10} measurements began at El Toro/ Mission Viejo. There were three violations of the state PM_{10} standard in 2007, the most since 2002, but none in 2008.

- No violations of the recently revoked federal ultra-fine particulate ($PM_{2.5}$) standard of 65 $\mu g/m^3$ have been recorded in seven years of measurements. However, the recently adopted, more stringent standard of 35 $\mu g/m^3$ has been exceeded an average of 1.3 percent of all measurement days, but none in 2008, the most recent year for which published data are available.

Although complete attainment of every clean air standard is not yet imminent, extrapolation of the steady improvement trend suggests that such attainment could occur within the reasonably near future.

4.3.2 Significance Criteria

The State CEQA Guidelines suggest, from an "air quality" perspective, that a project would normally be judged to produce a significant or potentially significant effect on the environment if the project were to:

- Conflict with or obstruct implementation of the applicable air quality plan.

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standards.

- Expose sensitive receptors to substantial air pollutant concentrations.

- Create objectionable odors affecting a substantial number of people.

Regional Significance Thresholds

In order to determine whether or not a proposed project would cause a significant effect on the environment, the impact of the project must be determined by examining the types and levels of emissions generated and its impacts on factors that affect air quality. To accomplish this determination of significance, the SCAQMD has established air pollution thresholds against which a proposed project can be evaluated and assist lead agencies in determining whether or not the proposed project is significant. If the thresholds are exceeded by a proposed project, then it should be considered significant.

While, the final determination of significance thresholds is within the purview of the lead agency pursuant to the State CEQA Guidelines, the SCAQMD *recommends* that the following air pollution thresholds be used by lead agencies in determining whether the construction or operational phase of a proposed project is significant.[2] If the lead agency finds that the proposed project has the potential to exceed any of the air pollution thresholds, the project should be considered significant. These threshold factors are included in Table 4.3-5.

Table 4.3-5

SCAQMD Regional Construction Significance Thresholds[1]
Pacific Coast Highway/Del Prado Avenue Phase I Street Improvement Project

Air Pollutant	Construction Phase (lbs/day)
Reactive Organic Gases (ROG)	75
Nitrogen Oxides (NOx)	100
Carbon Monoxide (CO)	550
Sulfur Oxides (SOx)	150
Coarse Inhalable Particulates (PM_{10})	150
Fine Inhalable Particulates ($PM_{2.5}$)	55
Lead (Pb)	3

[1]The proposed project does not propose development that would result in operational air quality emissions.

SOURCE: South Coast Air Quality Management District

Projects with daily operation-related emissions that exceed any of the above construction emission thresholds may be considered significant. The SCAQMD indicates in Chapter 6 of its *Handbook* that it considers a project to be mitigated to a level of insignificance if its primary effects are mitigated below the thresholds provided above.

Additional Indicators

The SCAQMD recommends that "additional indicators" should be used as screening criteria with respect to air quality. Additional factors relevant to the project at hand identified in the *Handbook* include the following significance criteria:

[2]The proposed project does not include any development and/or activities that would result in long-term (i.e., operational) air pollutant emissions. Therefore, the analysis conducted for this project evaluates only potential short-term air quality impacts resulting from the construction activities associated with the proposed roadway/street improvements.

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation.
- Project could result in population increases within the regional statistical area which would be in excess of that projected in the AQMP and in other than planned locations for the project's build-out year.
- Project could generate vehicle trips that cause a CO hot spot.

The SCAQMD CEQA Handbook also identifies various secondary significance criteria related to toxic, hazardous or odorous air contaminants. Hazardous air contaminants are also contained within the small diameter particulate matter (i.e., $PM_{2.5}$) fraction of diesel exhaust. Such exhaust will be generated by heavy construction equipment.

Chapter 6 of the SCAQMD *Handbook* indicates that it considers a project to be mitigated to a level of insignificance if its effects are mitigated below the thresholds presented in Table 4.3-5.

4.3.3 Standard Conditions

SC 4.3-1 Adherence to SCAQMD Rule 403, which sets requirements for dust control associated with grading and construction activities.

SC 4.3-2 Adherence to SCAQMD Rules 431.1 and 431.2, which require the use of low sulfur fuel for stationary construction equipment.

SC 4.3-3 Adherence to SCAQMD Rule 1108, which sets limitations on ROG content in asphalt.

As indicated above, the project will be subject to SCAQMD Rule 403 (Fugitive Dust) during construction. SCAQMD Rule 403 does not require a permit for construction activities, *per se*, but rather, sets forth general and specific requirements for all construction sites (as well as other fugitive dust sources) in the SCAB. The general requirement prohibits a person from causing or allowing emissions of fugitive dust from construction (or other fugitive dust source) such that the presence of such dust remains visible in the atmosphere beyond the property line of the emissions source. SCAQMD Rule 403 also prohibits a construction site from causing an incremental PM_{10} concentration impact at the property line of more than 50 micrograms per cubic meter as determined through PM_{10} high-volume sampling, but the concentration standard and associated PM_{10} sampling do not apply if specific measures identified in the rule are implemented and appropriately documented. In accordance with Rule 403, the SCAQMD requires that contractors implement Best Available Control Technology (BACT) for construction activities. Rule 403 identifies two sets of specific measures, one for all projects and another set of conditions for projects that exceed 50 acres. (It is important to note that these measures are regulatory requirements and as such, do not constitute mitigation under CEQA.)

4.3.4 Potential Impacts

4.3.4.1 Short-Term Construction Impacts

Construction Impacts

Regional Thresholds

Dust is typically the primary concern during construction of new infrastructure. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions." Emission rates vary as a function of many parameters (e.g., soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). These parameters are not known with any reasonable certainty prior to project development and may change from day to day. Any assignment of specific parameters to an unknown future date is speculative and conjectural. Therefore, because of the inherent uncertainty in the predictive factors for estimating fugitive dust generation, regulatory agencies typically use one universal "default" factor based on the area disturbed assuming that all other input parameters into emission rate prediction fall into midrange average values. This assumption may or may not be totally applicable to site-specific conditions on the proposed project site.

Average daily PM_{10} emissions during site grading and other disturbance are stated in the SCAQMD Handbook to be 26.4 pounds/acre. This estimate is based upon required dust control measures in effect in 1993 when the AQMD CEQA Air Quality Handbook was prepared. Rule 403 was subsequently strengthened to require use of a greater array of fugitive dust control on construction projects. All construction projects in the SCAQMD are required to use strongly enhanced control procedures. Use of enhanced dust control procedures such as continual soil wetting, use of supplemental binders, early paving, etc. can achieve a substantially higher PM_{10} control efficiency. Daily emissions with use of reasonably available control measures (RACMs) for PM_{10} can reduce emission levels to 10 pounds per acre per day. With the use of best available control measures (BACMs) the California Air Resources Board URBEMIS2007 computer model predicts that emissions can be reduced to two pounds per acre per day. Because of the PM_{10} non-attainment status of the air basin, construction activity dust emissions are considered to have a cumulatively significant impact. Use of BACMs is, therefore, required even if SCAQMD individual CEQA thresholds are not exceeded by use of RACMs.

Current research in particulate-exposure health suggests that the most adverse effects derive from ultra-small diameter particulate matter comprised of chemically reactive pollutants such as sulfates, nitrates or organic material. A national clean air standard for particulate matter of 2.5 microns or smaller in diameter (i.e., $PM_{2.5}$) was adopted in 1997. A limited amount of construction activity particulate matter is in the $PM_{2.5}$ range, which is estimated by the SCAQMD to comprise 20.8 percent of PM_{10}. Other studies have shown that the fugitive dust fraction of $PM_{2.5}$ is closer to 10 percent. Daily $PM_{2.5}$ emissions during construction with the use of BACMs will be approximately two pounds per day compared to the SCAQMD CEQA significance threshold of 55 pounds per day.

In addition to fine particles that remain suspended in the atmosphere semi-indefinitely, construction activities generate many larger particles with shorter atmospheric residence times. This dust is comprised mainly of large diameter inert silicates that are chemically non-reactive and are further readily filtered out by human breathing passages. These fugitive dust particles are therefore more of a potential soiling nuisance as they settle out on parked cars, outdoor furniture or landscape foliage rather than any adverse health hazard. The deposition distance of most soiling nuisance particulates is less than 100 feet from the source based on prior EPA studies. There are several sensitive receptors within 100 feet from the primary construction site. Required use of BACMs will minimize generation of large diameter particulate matter as well as controlling $PM_{10}/PM_{2.5}$. As a result, dust nuisance effects will be mitigated by

control measures and by the temporary duration of construction activities near any individual receiver location.

Exhaust emissions will result from on and off-site heavy equipment. The types and numbers of equipment will vary among contractors such that such emissions cannot be quantified with certainty. Equipment exhaust emissions were calculated presuming that initial clearing will gradually shift toward grading and paving and finally for finish drainage, utility installation, roadway striping and landscaping, etc. Grading activities (which provide fugitive dust exposure) will only occur in the parkway and entry areas and not in the main roadways where paving is the predominant activity. Based on the equipment fleet anticipated to be employed during the roadway improvement project (refer to Appendix D), the air emissions anticipated from the construction activities are presented in Table 4.3-6.

Table 4.3-6

Construction Activity Emissions
(Emissions in Pounds/Day)

Activity	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Hardscape/Resurface						
No Mitigation	4.3	27.8	17.6	0.0	2.6	2.1
Mitigation	4.3	27.8	17.6	0.0	2.6	2.1
Underground Utilities (Dry)						
No Mitigation	2.5	14.3	10.3	0.0	23.8	5.9
Mitigation	2.5	14.3	10.3	0.0	2.8	1.5
Underground Utilities (Wet)						
No Mitigation	2.4	16.0	11.0	0.0	23.8	5.9
Mitigation	2.4	16.0	11.0	0.0	2.9	1.5
Landscape Improvements						
No Mitigation	2.1	10.0	8.0	0.0	0.9	0.8
Mitigation	2.1	10.0	8.0	0.0	0.9	0.8
Signals, Signage and Striping						
No Mitigation	5.9	38.8	40.4	0.1	2.6	2.2
Mitigation	5.9	38.8	40.4	0.1	2.6	2.2
SCAQMD Threshold	**75**	**100**	**550**	**150**	**150**	**55**

NOTE: Because URBEMIS assumes that construction equipment becomes progressively cleaner in the future, this provides a worst case estimate. If construction occurs after 2011, emissions will be slightly lower.

SOURCE: Giroux & Associates (August 2010)
URBEMIS2007 Model (Output in Appendix D)

As indicated in Table 4.3-6, peak daily construction activity emissions will be below SCAQMD CEQA thresholds. Nevertheless, because of the basin's non-attainment status for $PM_10/PM_{2.5}$, SCAQMD recommends use of standard fugitive dust control mitigation measures for any project in the region. Because of the role of NOx in basin smog formation, use of reasonably available NOx control measures is also recommended. Mitigation measures prescribed to reduce/minimize dust are prescribed in Section 4.3.5.

SCAQMD Rule 403 governs fugitive dust emissions from construction projects. This rule sets forth a list of control measures that must be undertaken for all construction projects to ensure that no dust emissions from the project are visible beyond the property boundaries. Adherence to Rule 403 is mandatory and as such, does not denote mitigation under CEQA. The analysis assumes the use of the minimal measures specified in Rule 403 that overlap between the Rule and the URBEMIS model, including:

- Soil stabilizers shall be applied to all disturbed, inactive areas,
- Ground cover shall be quickly applied in all disturbed areas,
- The active construction site shall be watered twice daily,
- Soil transfer shall be controlled with water spray, and
- Unpaved haul roads shall be watered twice daily.

In actuality, Rule 403 specifies several measures that the URBEMIS model does not consider so the modeled PM_{10} and $PM_{2.5}$ emissions associated with fugitive dust are considered as conservative.

As previously noted, construction equipment exhaust contains carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24-hour per day, 365 days per year, 70-year lifetime exposure. Public exposure to heavy equipment emissions will be an extremely small fraction of the above dosage assumption. Diesel equipment is also becoming progressively "cleaner" in response to air quality rules on new off-road equipment.

The SCAQMD does not generally require the analysis of construction related diesel emissions relative to health risk due to the short period for which the majority of diesel exhaust would occur. The majority of diesel exhaust would occur during the estimated 10-12 months of construction activity for this project, but only briefly at any single location. Health risk analyses are typically assessed over a 9-, 30-, or 70-year time frame and not over a period of months due to the lack of health risk associated with such a brief exposure.

Localized Significance Thresholds

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Localized Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005.

Use of an LST analysis for a project is optional. For roadway improvement projects, the only source of LST impact would be during construction. LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

LST pollutant concentration data is currently published for 1-, 2-, and 5-acre sites for varying distances. LST analysis for construction is applicable for all projects of five acres and less. Although the total disturbance area is large, URBEMIS estimates that approximately 2.25 acres will be under simultaneous disturbance during the project life cycle. Given the linear length of the project, it is unlikely that any single receptor would be exposed to a disturbance area larger than two acres. Receptors are only exposed to construction activity emissions in their immediate proximity. A two-acre maximum daily disturbance area was utilized for construction activities at this project site. Because thresholds are more generous for

larger sites, if the project meets standards for a two-acre site, then utilizing a larger acreage would meet thresholds by a greater margin of safety

LST screening tables are only available for 25-, 50-, 100-, 200-, and 500-meter source-receptor distances. Utilizing data for a 2-acre site and a conservative source receptor distance of 25 meters, the thresholds and emissions are determined (pounds per day) for the proposed project are presented in Table 4.2-7.

Table 4.3-7

LST and Project Emissions
(Emissions in Pounds/Day)

Saddleback Valley	CO	NOx	PM_{10}	$PM_{2.5}$
Proposed Project				
Maximum (Unmitigated)	40	39	24	6
Maximum (Mitigated)	40	39	3	2
Localized Significance Threshold	**993**	**131**	**6**	**4**
SOURCE: Giroux & Associates (August 2010)				

As indicated in Table 4.3-7, PM_{10} and $PM_{2.5}$ construction emissions would exceed the LST threshold prior to implementing mitigation measures; however, with the implementation of the mitigation measures prescribed in Section 4.3.5, the project-related emissions would not exceed the LSTs established for the project. Therefore, potential impacts would be reduced to a less than significant level.

4.3.4.2 Long-Term Operational Impacts

The project does not result in any additional vehicle trip generation or associated mileage. Future increases in traffic levels may occur due to buildout of the area, which are not attributed to the proposed project. These possible increases would occur with or without the project. Therefore, operational impacts were not examined in the air quality analysis conducted for the proposed project.

As previously indicated, project implementation will not result in additional development that would generate additional vehicular trips and, as a result, long-term (i.e., operational) air quality impacts. Although potential long-term pollutant emissions will not occur as a result of project implementation, the proposed circulation improvements may result in the redistribution of future traffic, which could affect potential microscale impacts (i.e., CO "hotspots").

Microscale air quality impacts have traditionally been analyzed in environmental documents where the air basin was a non-attainment area for CO. Although CO "hot-spots" generally no longer occur in the SCAB, a CO screening analysis was performed at closest intersections surrounding the project to verify that conclusion. One-hour CO concentrations were calculated on the sidewalk adjacent to these intersections. Peak one-hour levels (i.e., ppm above background) are reflected in Table 4.3-8.

Table 4.3-8

One-Hour CO Concentrations Above Background
(Concentrations in ppm)

Intersection	Existing	2015 No Project	2015 w/ Project	2035 No Project	2035 w/ Project
AM Peak Hour					
Blue Lantern/PCH	0.9	0.7	0.7	0.2	0.3
Ruby Lantern/PCH	0.6	0.5	0.6	0.3	0.3
Amber Lantern/PCH	0.6	0.5	0.7	0.2	0.3
Violet Lantern/PCH	0.6	0.5	0.7	0.2	0.3
Golden Lantern/PCH	0.8	0.7	0.9	0.4	0.5
Copper Lantern/PCH	0.9	0.7	1.0	0.4	0.5
Crystal Lantern/PCH	1.2	0.9	0.9	0.5	0.5
Ruby Lantern/Del Prado	0.5	0.4	0.1	0.2	0.1
Amber Lantern/Del Prado	0.5	0.4	0.2	0.2	0.1
Violet Lantern/Del Prado	0.5	0.4	0.1	0.2	0.1
Golden Lantern/Del Prado	0.6	0.5	0.3	0.2	0.1
Del Prado/PCH	DNE	DNE	0.6	DNE	0.3
Blue Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Ruby Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Amber Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Violet Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Golden Lantern/Alley	N/A	0.0	0.0	0.0	0.0
PM Peak Hour					
Blue Lantern/PCH	1.1	0.9	0.9	0.5	0.5
Ruby Lantern/PCH	0.6	0.6	0.7	0.4	0.4
Amber Lantern/PCH	0.6	0.5	0.8	0.2	0.4
Violet Lantern/PCH	0.6	0.6	0.9	0.3	0.5
Golden Lantern/PCH	0.9	0.7	1.1	0.5	0.6
Copper Lantern/PCH	1.0	0.8	1.2	0.4	0.7
Crystal Lantern/PCH	1.3	1.1	1.1	0.6	0.6
Ruby Lantern/Del Prado	0.6	0.6	0.1	0.5	0.1
Amber Lantern/Del Prado	0.6	0.5	0.2	0.2	0.1
Violet Lantern/Del Prado	0.6	0.5	0.2	0.3	0.1
Golden Lantern/Del Prado	0.8	0.7	0.4	0.4	0.2
Del Prado/PCH	DNE	DNE	0.9	DNE	0.4
Blue Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Ruby Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Amber Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Violet Lantern/Alley	N/A	0.0	0.0	0.0	0.0
Golden Lantern/Alley	N/A	0.0	0.0	0.0	0.0

DNE – Does not exist
N/A – Not Available

SOURCE: Giroux & Associates (August 2010)
Screening Analysis Based on CALINE4 Model

Existing peak (2008) one-hour local CO background levels are 2.0 ppm. Combined background (2.0 ppm) plus local (1.2 ppm) equate to CO levels of 3.2 ppm, which are far below the one-hour standard of 20 ppm. Worst-case one-hour levels are even lower than the allowable 8-hour exposure of 9 ppm. Any redistribution of traffic associated with the proposed project would create negligible changes in local air quality. Micro-scale impacts are less than significant; no mitigation measures are required.

4.3.4 Mitigation Measures

As indicated in Section 4.3.4, construction activities associated with the proposed project are not anticipated to cause emissions to exceed SCAQMD significance thresholds. Nevertheless, mitigation through enhanced dust control measures is recommended for use due to the "non-attainment" status of the South Coast Air Basin.

MM 4.3-1 The following dust control measures shall be implemented during construction of the proposed street improvement project.

- Apply soil stabilizers or moisten inactive areas.
- Prepare and implement, if determined necessary, a high wind dust control plan.
- Address previously disturbed areas if subsequent construction is delayed.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically three times/day).
- Cover all stockpiles with tarps at the end of each day or as needed.
- Provide water spray during loading and unloading of earthen materials.
- Post speed limits throughout the construction zone and approved haul route.
- Minimize in-out traffic from the construction zone.

Diesel exhaust particulates and NOX emissions would not have a significant impacts with or without stringent emissions controls. However, because the South Coast Air Basin is designated "non-attainment" for ozone, of which NOx is a precursor, and, furthermore, because it is an identified carcinogen, reasonably available control measures should be included, as recommended below.

MM 4.3-2 The following diesel exhaust reduction measures shall be implemented during construction of the proposed street improvement project.

- Require 90-day low-NOx tune-ups for off-road equipment.
- Limit allowable idling to five minutes for trucks and heavy equipment.
- Utilize equipment whose engines are equipped with diesel oxidation catalysts, if available.
- Utilize diesel particulate filters on heavy equipment, where feasible.

4.3.5 Level of Significance After Mitigation

Implementation of the Standard Conditions identified in Section 4.3.3 that require compliance with SCAQMD and related regulatory requirements and implementation of the mitigation measures prescribed to reduce project-related emissions will ensure that potential impacts are reduced to a less than significant level. No significant unavoidable impacts will occur as a result of project implementation.