5.5 AIR QUALITY

This section evaluates air quality conditions associated with short and long-term impacts resulting from construction of the proposed Foothill Parkway extension. Information in this section is based on the *Air Quality Assessment Foothill Parkway Westerly Extension*, prepared by RBF Consulting (RBF), dated August 2007. The *Air Quality Assessment* contains quantitative construction emission estimates based on the URBEMIS 2007 model developed by the California Air Resources Board (CARB) (refer to Appendix 15.5, AIR QUALITY ASSESSMENT).

5.5.1 REGULATORY SETTING

Regulatory oversight for air quality in the South Coast Air Basin (SCAB) rests at the regional level with the South Coast Air Quality Management District (SCAQMD), the CARB at the State level, and the Environmental Protection Agency (EPA) Region IX office at the Federal level.

U.S. ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is responsible for implementing the Federal Clean Air Act (FCAA), which was first enacted in 1955 and amended numerous times after. The FCAA established Federal air quality standards known as the National Ambient Air Quality Standards (NAAQS). These standards identify levels of air quality for "criteria" pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2, which is a form of nitrogen oxides [NO_X]), sulfur dioxide (SO_2, which is a form of sulfur oxides [SO_X]), particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively), and lead (Pb); refer to Table 5.5-1, NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS.

CALIFORNIA AIR RESOURCES BOARD

CARB administers the air quality policy in California. The California Ambient Air Quality Standards (CAAQS) were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the CAAQS in Table 5.5-1, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility reducing particulates, hydrogen sulfide, and sulfates.

The California Clean Air Act (CCAA), which was approved in 1988, requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with the CAAQS. These AQMPs also serve as the basis for preparation of the State Implementation Plan (SIP) for the State of California.

Table 5.5-1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California[1]		Federal[2]	
		Standard[3]	Attainment Status	Standards[4]	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m³)	**Nonattainment**	NA[5]	NA[5]
	8 Hours	0.07 ppm (137 μg/m³)	Unclassified	0.08 ppm (157 μg/m³)	**Nonattainment**
Particulate Matter (PM_{10})	24 Hours	50 μg/m³	**Nonattainment**	150 μg/m³	**Nonattainment**
	Annual Arithmetic Mean	20 μg/m³	**Nonattainment**	NA[7]	**Nonattainment**
Fine Particulate Matter ($PM_{2.5}$)	24 Hours	No Separate State Standard		35 μg/m³	Unclassified
	Annual Arithmetic Mean	12 μg/m³	**Nonattainment**	15 μg/m³	**Nonattainment**
Carbon Monoxide (CO)	8 Hours	9.0 ppm (10 mg/m³)	Attainment	9 ppm (10 mg/m³)	Attainment
	1 Hour	20 ppm (23 mg/m³)	Attainment	35 ppm (40 mg/m³)	Attainment
Nitrogen Dioxide (NO_2)[6]	Annual Arithmetic Mean	0.030 ppm (56 μg/m³)	NA	0.053 ppm (100 μg/m³)	Attainment
	1 Hour	0.18 ppm (338 μg/m³)	Attainment	N/A	NA
Lead (Pb)	30 days average	1.5 μg/m³	Attainment	N/A	NA
	Calendar Quarter	N/A	NA	1.5 μg/m³	Attainment
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	N/A	NA	0.030 ppm (80 μg/m³)	Attainment
	24 Hours	0.04 ppm (105 μg/m³)	Attainment	0.14 ppm (365 μg/m³)	Attainment
	3 Hours	N/A	NA	N/A	Attainment
	1 Hour	0.25 ppm (655 μg/m³)	Attainment	N/A	NA
Visibility-Reducing Particles	8 Hours (10 a.m. to 6 p.m., PST)	Extinction coefficient = 0.23 km@<70% RH	Unclassified	**No Federal Standards**	
Sulfates	24 Hour	25 μg/m³	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m³)	Unclassified		
Vinyl Chloride	24 Hour	0.01 ppm (26 μg/m³)	Unclassified		

μg/m³ = micrograms per cubic meter; ppm = parts per million; km = kilometer(s); RH = relative humidity; PST = Pacific Standard Time; N/A = Not Applicable.

Notes:
1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter-PM_{10} 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 the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. In 1990, CARB identified vinyl chloride as a toxic air contaminant, but determined that there was not sufficient available scientific evidence to support the identification of a threshold exposure level. This action allows the implementation of health-protective control measures at levels below the 0.010 ppm ambient concentration specified in the 1978 standard.
2. National standards (other than ozone, particulate matter and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. EPA also may designate an area as *attainment/unclassifiable*, if: (1) it has monitored air quality data that show that the area has not violated the ozone standard over a three-year period; or (2) there is not enough information to determine the air quality in the area. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration is expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. The Federal 1-hour ozone standard was revoked on June 15, 2005 in all areas except the 14 8-hour ozone nonattainment Early Action Compact (EAC) areas.
6. The Nitrogen Dioxide ambient air quality standard was amended in February 22, 2007 to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after the regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.
7. The Environmental Protection Agency revoked the annual PM_{10} standard in 2006 (effective December 16, 2006).

Source: California Air Resources Board and U.S. Environmental Protection Agency, February 22, 2007.

Like the EPA, the CARB also designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as nonattainment.

Under the CCAA, the SCAB is designated as a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The SCAB is designated as an attainment area for CO, NO_2, SO_2, and Pb; refer to Table 5.5-1. Similar to the FCAA, all areas designated as nonattainment under the CCAA are required to prepare plans showing how the area would meet the CAAQS by its attainment dates. The AQMP is the plan for improving air quality in the region.

The amendments to the CCAA establish the CAAQS, and a legal mandate to achieve these standards by the earliest practicable date. These standards apply to the same criteria pollutants as the FCAA, and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride; refer to Table 5.5-1.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The SCAQMD is one of 35 air quality management districts that have prepared Air Quality Management Plans to accomplish a five-percent annual reduction in emissions. The *2007 Air Quality Management Plan for the South Coast Air Basin* (*2007 AQMP*) relies on a multi-level partnership of governmental agencies at the Federal, State, regional, and local level. The *2007 AQMP* proposes policies and measures to achieve Federal and State standards for improved air quality in the SCAB and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under the SCAQMD jurisdiction.

The *2007 AQMP* also addresses several State and Federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The *2007 AQMP* is consistent with and builds upon the approaches taken in the *2003 Air Quality Management Plan*, the *1997 Air Quality Management Plan*, and the *1999 Amendments to the Ozone State Implementation Plan* for the SCAB for the attainment of the Federal ozone air quality standard.

The *2007 AQMP* incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The *2007 AQMP* includes new information on key elements such as:

- Current air quality;
- Improved emission inventories, especially significant increase in mobile source emissions;
- An overall control strategy comprised of: Stationary and Mobile Source Control Measures, South Coast Air Quality Management District, State and Federal Stationary and Mobile Source Control Measures, and the Southern

California Association of Governments Regional Transportation Strategy and Control Measures;

- New attainment demonstration for $PM_{2.5}$ and O_3;
- Milestones to the Federal Reasonable Further Progress Plan; and
- Preliminary motor vehicle emission budgets for transportation conformity purposes.

In addition to the *2007 AQMP* and its rules and regulations, the SCAQMD published the *CEQA Air Quality Handbook*. The *CEQA Air Quality Handbook* provides guidance to assist local government agencies and consultants in developing the environmental documents required by CEQA. With the help of the *CEQA Air Quality Handbook*, local land use planners and other consultants are able to analyze and document how proposed and existing projects affect air quality and should be able to fulfill the requirements of the CEQA review process. The SCAQMD is in the process of developing an *Air Quality Analysis Guidance Handbook* to replace the current *CEQA Air Quality Handbook* approved by the SCAQMD Governing Board in 1993.

STATE TOXICS PROGRAM

Toxic air contaminants are another group of pollutants of concern in Southern California. There are hundreds of different types of toxic air contaminants, with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle engine exhaust. Public exposure to toxic air contaminants can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset spill conditions. Health effects of toxic air contaminants include cancer, birth defects, neurological damage, and death.

California regulates toxic air contaminants through its air toxics program, mandated in Chapter 3.5 (Toxic Air Contaminants) of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 (Air Toxics “Hot Spots” Information and Assessment) (H&SC Section 44300 et. seq.). CARB, working in conjunction with the State Office of Environmental Health Hazard Assessment (OEHHA), identifies toxic air contaminants. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified toxic air contaminant to below a specific threshold, based on its effects on health, or to the lowest concentration achievable through use of best available control technology for toxics. The program is administered by the CARB. Air quality control agencies, including the SCAQMD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by the CARB.

CITY OF CORONA GENERAL PLAN

The *City of Corona General Plan* Environmental Resources Element provides goals, policies, and implementation measures for air quality. The Environmental Resources Element indicates the City recognizes the importance of ongoing land use planning, development, and public education measures to reduce contributing air pollutants

constituents. Applicable Goals and Policies relative to the Project site within the Environmental Resources Element are included in Table 5.5-2, below.

Table 5.5-2
Consistency Analysis with the *City of Corona General Plan*
Goals and Policies for Air Quality

GOALS AND POLICIES	PROJECT CONSISTENCY
Environmental Resources Element Goals	
Land Use Planning and Air Quality Goal 10.18: *Improve air quality conditions within the Corona Planning Area by controlling point sources, reducing vehicle trips, and striving to achieve attainment of ozone, nitrogen dioxide, carbon monoxide, and sulfate standards as enforced by the South Coast Air Quality Management District.*	The proposed Project would result in the redistribution of traffic in the vicinity of the roadway extension; refer to Impact Discussion 5.4-2 in Section 5.4, TRAFFIC AND CIRCULATION. The proposed Project shall comply with the South Coast Air Quality District Management's Air Quality Management Plan and has been demonstrated to not have any air quality impacts/violations post-construction. Also, it would not introduce any point source emissions. Therefore, the Project is consistent with Goal 10.18 of the Environmental Resources Element.
Land Use Planning and Air Quality Goal 10.19: *Reduce vehicle trip generation within the Corona Planning Area through transit, shuttle, carpooling and cycling facilities.*	The Project proposes a Class II Bike Lane along the Foothill Parkway Westerly Extension. Therefore, the Project is consistent with Goal 10.19 of the Environmental Resources Element.
Environmental Resources Element Policies	
Land Use Planning and Air Quality Policy 10.18.3: *Incorporate the provisions of the South Coast Air Quality District Management Plans as conditions of approval for all new development and re-development projects.*	Impact Discussion 5.5-3 concludes that the proposed roadway alignment would be consistent with the implementation of the South Coast Air Quality District's Management Air Quality Management Plan, as well as Rules 402 and 403. Therefore, the Project is consistent with Policy 10.18.3 of the Environmental Resources Element.
Land Use Planning and Air Quality Policy 10.19.5: *Continue to incorporate bicycle lanes in all new and upgrade roadway projects, in order to encourage commuter bicycle trips. Also, improve existing bicycle laneways for greater user safety.*	Refer to the response to Goal 10.19, above. Accordingly, the Project is consistent with Policy 10.19.5 of the Environmental Resources Element.

5.5.2 EXISTING CONDITIONS

SOUTH COAST AIR BASIN

The State of California is divided into 15 air basins, with the Project site being located within the SCAB. The SCAB is a 6,600-square mile area bound by the Pacific Ocean to the west and the San Gabriel, the San Bernardino, and the San Jacinto mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass located in Riverside County. The extent and severity of the air pollution problem in the SCAB is a function of the area's physical characteristics, such as the weather and topography, as well as man-made influences such as development patterns and lifestyles. Also, factors such as wind, sunlight, temperature, humidity, rainfall, and topography all contribute to the accumulation and dispersion of pollutants throughout the SCAB.

Precipitation

Although the SCAB is characterized as a semi-arid climate, the air near the ground surface is moist because of the presence of a shallow marine layer. The ocean has a predominant effect on the SCAB, except for infrequent periods when dry, continental air is carried into the SCAB by offshore winds. Precipitation in the SCAB is approximately nine to 14 inches annually and is rarely in the form of snow or hail due to the generally warm weather within the SCAB. Rainfall tends to be more frequent in the costal areas of the SCAB. Additionally, periods of heavy fog and low stratus clouds, which are referred to as “high fog”, are frequent and a typical characteristic of the SCAB climate.

Temperature

The SCAB is characterized as a “Mediterranean” climate, with a semi-arid environment, including mild winters and moderate rainfall. The distinctive climate of the SCAB is determined by its terrain and geographical location, as the SCAB is a coastal plain with connecting broad valleys and low hills. The annual temperature has little variability throughout the SCAB, averaging 75 degrees Fahrenheit (°F). However, with a less pronounced oceanic influence, the eastern inland portions of the SCAB show greater variability in annual minimum and maximum temperatures. The SCAB has had recorded temperatures of over 100°F in recent years throughout each portion of the SCAB. January is generally the coldest month in all locations, while July and August tend to be the hottest months of the year.

Inversion Layers

Inversion layers exist when the air temperature increases with elevation above the ground. The strength, altitude, and duration of inversions determine the amount of vertical atmospheric mixing, which subsequently contributes to PM_{10} (particulate matter smaller than 10 microns [ten one-millionths of a meter]) concentrations in the SCAB. Temperature inversions occur in a stable atmosphere of warm air over cooler air, hindering the upward dispersion of pollutants. Mixing ceases at the base of the inversion, which is also known as the mixing height, which controls the volume of air available for the mixing and dispersion of air pollutants.

The potential for high contaminant levels varies seasonally for many contaminants. In the late spring, summer, and early fall light winds, low mixing heights, and sunshine combine to produce conditions favorable for the maximum production of oxidants, which is generally oxygen. When fairly deep marine layers occur in the SCAB during the spring and summer seasons, sulfate concentrations achieve yearly peak concentrations. Also, when strong surface inversions are formed on winter nights, especially during the hours before sunrise, coupled with near-calm winds, carbon monoxide from automobile exhaust becomes highly concentrated. The highest yearly concentrations of carbon monoxide, oxides of nitrogen, and nitrates are measured during November, December, and January.

Subsidence inversions are caused by downward vertical motion in the atmosphere. As air descends, it warms due to compression, and as a result becomes warmer than the air beneath it. This is common when the semi-permanent Pacific high pressure system is located off the west coast, which typically occurs during the summer months.

LOCAL AMBIENT AIR QUALITY

CARB monitors ambient air quality at approximately 250 air monitoring stations across the State. Air quality monitoring stations usually measure pollutant concentrations ten feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Ambient air pollutant concentrations in the SCAQMD are measured at 36 air quality monitoring stations. Local air quality levels within the Project area were measured at both the Norco-Norconian Monitoring Station and the Riverside-Rubidoux Monitoring Station. Air quality data from 2002 to 2006 from the monitoring stations is provided in Table 5.5-3, LOCAL AIR QUALITY LEVELS. The following air quality information briefly describes the various types of pollutants.

Carbon Monoxide (CO). Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, unconsciousness, and death. The State and Federal standard for CO is 9.0 parts per million (ppm), averaged over eight hours. The maximum eight-hour concentration at the Riverside-Rubidoux Monitoring Station averaged 3.14 ppm from 2002 to 2006. State and Federal standards were not exceeded between 2002 and 2006. The SCAB has recently achieved attainment for CO.

Ozone (O_3). Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. The troposphere extends approximately ten miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the “good” ozone layer) extends upward from about ten to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B). “Bad” ozone is a photochemical pollutant, and needs volatile organic compounds (VOCs), Nitrogen Oxides (NO_X), and sunlight to form; therefore, VOCs and NO_X are ozone precursors. VOCs and NO_X are emitted from various sources throughout the City. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Table 5.5-3
Local Air Quality Levels[1]

Pollutant	Primary Standard		Year	Maximum[1] Concentration	# of Days State/Federal Std. Exceeded
	California	Federal			
Carbon Monoxide (CO) [2]	9.0 ppm for 8 hours	9.0 ppm for 8 hours	2002 2003 2004 2005 2006	3.09 ppm 3.67 2.97 2.50 2.29	0/0 0/0 0/0 0/0 0/0
Ozone (O_3) (1-Hour) [2]	0.09 ppm for 1 hour	NA	2002 2003 2004 2005 2006	0.16 ppm 0.17 0.14 0.14 0.15	56/NA 80/NA 59/NA 46/NA 45/NA
Ozone (O_3) (8-Hour) [2]	0.07 ppm for 8 hours	0.08 ppm for 8 hours	2002 2003 2004 2005 2006	0.12 ppm 0.14 0.11 0.13 0.17	NA/35 NA/62 NA/35 NA/32 NA/30
Nitrogen Dioxide (NO_x)[3]	0.25 ppm for 1 hour	0.053 ppm annual average	2002 2003 2004 2005 2006	0.1 ppm 0.1 0.1 0.1 0.1	0/NA 0/NA 0/NA 0/NA 0/NA
Sulfur Dioxide (SO_x) [3]	0.25 ppm for 1 hour	0.14 ppm for 24 hours or 0.03 ppm annual arithmetic mean	2002 2003 2004 2005 2006	0.0 ppm 0.0 0.0 0.0 0.0	0/0 0/0 0/0 0/0 0/0
Particulate Matter (PM_{10}) [2,4,5]	50 µg/m^3 for 24 hours	150 µg/m^3 for 24 hours	2002 2003 2004 2005 2006	76.0µg/m^3 114.0 76.0 79.0 74.0	17/0 14/0 110 5/0 10/0
Particulate Matter ($PM_{2.5}$) [3,4,5]	No Separate State Standard	65 µg/m^3 for 24 hours	2002 2003 2004 2005 2006	77.6µg/m^3 104.3 91.7 98.7 68.4	NA/8 NA/8 NA/5 NA/4 NA/1

ppm = parts per million
µg/m^3 = micrograms per cubic meter
NM = Not Measured
PM_{10} = particulate matter 10 microns in diameter or less
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
NA = Not Applicable

Notes:
1. Maximum concentration is measured over the same period as the California Standard.
2. Measurements taken at the Riverside-Rubidoux Monitoring Station located at 5888 Mission Boulevard, Riverside, California 92509.
3. Measurements taken at the Norco-Norconian Monitoring Station located in the City of Norco US-NFAC.
4. PM_{10} exceedances are based on state thresholds established prior to amendments adopted on June 20, 2002.
5. PM_{10} exceedances are derived from the number of samples exceeded, not days.

Source: RBF Consulting, *Air Quality Assessment Foothill Parkway Westerly Extension*, August 2007.

Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some man-made materials (such as rubber, paint, and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

The State standard for O_3 is 0.09 ppm, averaged over one hour. The Federal standard for O_3, averaged over one hour, was revoked as of June 5, 2005, and therefore no longer applies. The 8-hour O_3 levels at the Riverside-Rubidoux Monitoring Station averaged at 0.13 ppm in 2002 to 2006. The State 8-hour standard for O_3 is 0.07 ppm, and was approved by CARB on April 28, 2005. The exceedances for the State standards have not yet been provided by CARB. The Federal standard for O_3 is 0.08 ppm, averaged over eight-hours, which was exceeded 194 times between 2002 and 2006 at the Riverside-Rubidoux Monitoring Station.

<u>Oxides of Nitrogen (NO_X or Nitrogen Dioxide [NO_2])</u>. Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level O_3, and react in the atmosphere to form acid rain. NO_2 (often used interchangeably with NO_X) is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_2 can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_2 concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

For NO_2, the SCAB is designated as being in attainment under both State and Federal standards. Nitrogen dioxide levels measured at the Riverside-Rubidoux Monitoring Station did not exceed the State standard between 2002 and 2006. The NO_2 ambient air quality standard was amended on February 22, 2007 to lower the State 1-hour standard to 0.18 ppm and establish a new Federal annual standard of 0.053 ppm. These changes became effective after regulatory changes were submitted and approved by the Office of Administrative Law.

<u>Oxides of Sulfur (SO_X) or Sulfur Dioxide (SO_2)</u>. Sulfur dioxide is a colorless, pungent gas belonging to the family of sulfur oxide gases (SO_X), formed primarily by combustion of sulfur-containing fossil fuels (primarily coal and oil), and during metal smelting and other industrial processes. The State standard for SO_2 is 0.25 ppm averaged over one-hour and the Federal standard is 0.14 ppm averaged over 24 hours. The SCAB is in attainment for SO_2, as it never exceeded State and Federal standards from 2002 through 2006 at the Riverside-Rubidoux Monitoring Station.

<u>Particulate Matter (PM_{10})</u>. PM_{10} refers to suspended particulate matter which is smaller than 10 microns or ten one-millionths of a meter. PM_{10} arises from sources

such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate into lungs and can potentially damage the respiratory tract. On June 19, 2003, the California Air Resources Board adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (Senate Bill 25).

The Federal 24-hour standard of 150 $\mu g/m^3$ (micrograms per meter cubed) was established. Maximum concentrations measured at the Norco-Norconian Monitoring Station have fluctuated from 76.0 $\mu g/m^3$ over 24 hours in 2002 to 114.0 $\mu g/m^3$ in 2003. The SCAB did not exceed the Federal standard between 2002 and 2006. The State standard for PM_{10} is 50 $\mu g/m^3$ averaged over 24 hours, which was exceeded for 57 days at the Norco-Norconian Monitoring Station between 2002 and 2006.

Fine Particulate Matter ($PM_{2.5}$). Due to recent increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with pre-existing cardiopulmonary disease. In 1997, the Environmental Protection Agency announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the Environmental Protection Agency, the U.S. Supreme Court reversed this decision and upheld the Environmental Protection Agency's new standards.

On January 5, 2005, the EPA published a Final Rule in the Federal Register that designates the SCAB as a nonattainment area for Federal $PM_{2.5}$ standards. On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by CARB that the previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year. Also argued was the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.[1] Based upon a desire to set clean air goals throughout the State, the State standard for $PM_{2.5}$ is 65 $\mu g/m^3$. At the Riverside-Rubidoux Monitoring Station, there were 42 exceedances between 2002 and 2006.

Volatile Organic Compounds (VOCs) or Reactive Organic Gases (ROG). Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases, including reactive organic gases (ROGs) and volatile organic compounds (VOCs). ROGs comprise all hydrocarbons except those exempted by the California Air Resources Board. Therefore, ROGs are a set of organic gases based on State rules and regulations. VOCs are similar to ROGs in that they comprise all organic gases except those exempted by Federal law. VOCs are therefore a set of organic gases based on Federal rules and regulations. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are

[1] California Environmental Protection Agency, Air Resources Board, *Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates,* May 3, 2002.

combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

Visibility. Visibility can be defined as the distance that atmospheric conditions permit a person to see at any given time. Technically, visibility is defined as the farthest distance an observer can distinguish a large black object against the horizon. Reduced visibility causes aesthetic impairment of surroundings and also interferes with aircraft operations. Visibility may be impaired by natural or man-made sources, including natural aerosols such as precipitation, fog, soil particles, volcanic emissions, vegetation, sea spray and organic decomposition products; and man-made sources such as sulfates and nitrates. Based on review of available technical data provided by CARB, visibility was not measured at the Monitoring Stations between 2002 and 2006.

Total Suspended Particulates (TSP). Total Suspended Particulates (TSP) is the name given to the solid matter suspended in the atmosphere. Approximately 9.5% of the TSP is generated by stationary sources. This complicated mixture of natural and man-made materials includes soil particles, biological materials, sulfates, nitrates, organic compounds (or carbon-containing compounds), and lead. A high volume sampler is used to determine TSP concentration by passing a measured column of air through a glass fiber filter. The filter then is weighed to determine the concentration of TSP, after which it is analyzed for lead, sulfate, and nitrate by a laboratory. TSP tends to be at higher concentrations during the day and has an unclear seasonal pattern. High dust levels result from strong winds and loose, arid soil. Larger dust particles pose a less serious health threat than the small particles produced by fossil fuel combustion. TSP monitoring was discontinued in 1991.

Lead (Pb). Lead is a metal that is a natural constituent of air, water, and the biosphere, and it is neither created nor destroyed in the environment. Therefore, it could essentially persist forever. It has been reported that exposure to low levels of lead can adversely affect the development and function of the central nervous system. Lead is not monitored at either of the nearby monitoring locations, as the SCAB has achieved attainment for lead under both the State and Federal standards.

Global Climate Change Gases. The natural process through which heat is retained in the troposphere is called the “greenhouse effect.” The greenhouse effect traps heat in the troposphere through a three-fold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and greenhouse gases in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This ”trapping” of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

Without the greenhouse effect, the Earth’s average temperature would be approximately -19 degrees Celsius (°C) (-2.2° Fahrenheit [°F]) instead of its present 14°C (57°F). The most abundant greenhouse gases are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of greenhouse gases, scientists have established a Global Warming Potential (GWP) for each greenhouse gas based on its ability to absorb

and re-radiate long wave radiation. The GWP of a gas is determined using carbon dioxide as the reference gas with a GWP of 1.

Greenhouse gases include, but are not limited to, the following:[2]

- *Water vapor (H_2O)*. Although water vapor has not received the scrutiny of other greenhouse gases, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively. The primary human-related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than 1 percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IGPCC) has not determined a Global Warming Potential for water vapor.

- *Carbon dioxide (CO_2)*. Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent.[3] Carbon dioxide is the most widely emitted greenhouse gas and is the reference gas (Global Warming Potential of 1) for determining Global Warming Potentials for other greenhouse gases. In 2004, 83.8 percent of California's greenhouse gas emissions were carbon dioxide.[4]

- *Methane (CH_4)*. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane come from landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The Global Warming Potential of methane is 21.

- *Nitrous oxide (N_2O)*. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The Global Warming Potential of nitrous oxide is 310.

- *Hydrofluorocarbons (HFCs)*. HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains

[2] All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[3] United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 to 2004*, April 2006, http://www.epa.gov/climatechange/emissions/usinventoryreport.html.

[4] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, December 2006, http://www.energy.ca.gov/2006publications/CEC 600 2006 013/CEC 600 2006 013 SF.PDF.

momentum. The Global Warming Potential of HFCs range from 140 for HFC-152a to 6,300 for HFC-236fa.

- *Perfluorocarbons (PFCs)*. Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent greenhouse gases with a Global Warming Potential several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years). [5] The Global Warming Potential of PFCs range from 5,700 to 11,900.

- *Sulfur hexafluoride (SF_6)*. Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent greenhouse gas that has been evaluated by the Intergovernmental Panel on Climate Change with a Global Warming Potential of 23,900. However, its global warming contribution is not as high as the Global Warming Potential would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm]). [6]

In addition to the six major greenhouse gases discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- *Hydrochlorofluorocarbons (HCFCs).* HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The Global Warming Potentials of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.

- *1,1,1 trichloroethane.* 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. In 1992, the Environmental Protection Agency issued a Final Rule (57 FR 33754) scheduling the phase out of methyl chloroform by 2002. Therefore, the threat posed by methyl chloroform as a greenhouse gas will diminish. However, the Global Warming Potential of methyl chloroform is 110 times that of carbon dioxide. [7]

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[5] Energy Information Administration, *Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride*, October 29, 2001, http://www.eia.doe.gov/oiaf/1605/gg00rpt/other_gases.html.

[6] United States Environmental Protection Agency, *High GWP Gases and Climate Change, October 19, 2006*, http://www.epa.gov/highgwp/scientific.html#sf6.

[7] United States Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, November 7, 2006, http://www.epa.gov/fedrgstr/EPA AIR/1996/January/Day 19/pr 372.html.

- *Chlorofluorocarbons (CFCs).* CFCs are used as refrigerants, cleaning solvents, and aerosol spray propellants. CFCs were also part of the Environmental Protection Agency's Final Rule (57 FR 3374) for the phase out of ozone depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with Global Warming Potentials ranging from 4,600 for CFC 11 to 14,000 for CFC 13. [8]

- *Ozone*. Ozone occurs naturally in the stratosphere where it is largely responsible for filtering harmful ultraviolet (UV) radiation. In the troposphere, ozone acts as a greenhouse gas by absorbing and re-radiating the infrared energy emitted by the Earth. As a result of the industrial revolution and rising emissions of oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) (ozone precursors), the concentrations of ozone in the troposphere have increased. Due to the short life span of ozone in the troposphere, its concentration and contribution as a greenhouse gas is not well established. However, the greenhouse effect of tropospheric ozone is considered small, as the radiative forcing of ozone is 25 percent of that of carbon dioxide. [9]

SENSITIVE RECEPTORS

Sensitive populations (sensitive receptors) are more susceptible to the effects of air pollution than the general population. Sensitive populations who are in proximity to localized sources of toxics and CO are of particular concern. Land uses that are considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The nearest sensitive receptors to the proposed roadway alignment are residential homes, located east of the Project site from Skyline Drive to Paseo Grande, the Cleveland National Forest, and estate residential uses located west of the Project site.

5.5.3 STANDARDS OF SIGNIFICANCE

CEQA GUIDELINES

Appendix G, *Initial Study Checklist*, of the CEQA Guidelines contains analysis guidelines related to the assessment of air quality impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project may create a significant environmental impact if one or more of the following occurs:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to *Impact Statement 5.5-3*);

[8] United States Environmental Protection Agency, *Class I Ozone Depleting Substances*, March 7, 2006, http://www.epa.gov/ozone/ods.html.

[9] Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis, Summary for Policymakers*, February 2007.

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer *to Impact Statements 5.5-1* and *5.5-2*);

- 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 standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) (refer to *Impact Statements 5.5-4* and *5.5-5*);

- Exposes sensitive receptors to substantial pollutant concentrations (refer to *Impact Statements 5.5-1* and *5.5-2*); and/or

- Create objectionable odors affecting a substantial number of people (refer to *Impact Statement 5.5-1*).

SCAQMD THRESHOLDS

Under CEQA, the SCAQMD is an expert commenting agency on air quality and related matters within its jurisdiction or impacting its jurisdiction. Under the FCAA, the SCAQMD has adopted federal attainment plans for O_3 and PM_{10}. The SCAQMD reviews projects to ensure that they will not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan.

The SCAQMD *CEQA Air Quality Handbook* (Handbook) provides significance thresholds for both construction and operation of projects within the SCAQMD jurisdictional boundaries. Exceedance of the SCAQMD thresholds could result in a potentially significant impact. If the project proposes development in excess of the established thresholds (refer to Table 5.5-4, SCAQMD EMISSION THRESHOLDS), a significant air quality impact may occur and additional analysis is warranted to fully assess the significance of impacts.

Table 5.5-4
SCAQMD Emissions Thresholds

Phase	Pollutant (lbs/day)					
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_X
Construction	75	100	550	150	55	150
Source: RBF Consulting, *Air Quality Assessment Foothill Parkway Westerly Extension*, August 2007.						

Since the Project does not propose trip generating land uses, the SCAQMD CO Hotspots Thresholds were utilized for the operations analysis, which are a measure of mobile (operational) emissions. The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project area are above or below State and Federal CO standards. If the project causes an exceedance of either the State 1-hour or 8-hour CO concentrations, the project would be considered to have a significant local impact. Also, if ambient levels already exceed a State or Federal standard, then project emissions would be considered significant if they

increase 1-hour CO concentrations by 1.0 ppm or more, or 8-hour CO concentrations by 0.45 ppm or more.

Based on these standards, the effects of the proposed alignment have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact.

Cumulative Emissions

The SCAQMD's *2007 AQMP* was prepared to accommodate growth, meet State and Federal air quality standards, and minimize the fiscal impact that pollution control measures have on the local economy. According to the SCAQMD's *CEQA Air Quality Handbook*, project-related emissions that fall below the established construction and operational thresholds should be considered less than significant unless there is pertinent information to the contrary.

If a project exceeds these emission thresholds, the SCAQMD *CEQA Air Quality Handbook* states that the significance of a project's contribution to cumulative impacts should be determined based on whether the rate of growth in average daily trips exceeds the rate of growth in population.

METHODOLOGY

The following models and guidelines are used as tools to create the analytical basis for the impact analysis. The tools are discussed below.

SCAQMD CEQA AIR QUALITY HANDBOOK

The Handbook provides guidance to assist local government agencies and consultants in developing the environmental documents required by CEQA. With the help of the Handbook, local land use planners and other consultants are able to analyze and document how proposed and existing projects affect air quality and should be able to fulfill the requirements of the CEQA review process. The SCAQMD is in the process of developing the *Air Quality Analysis Guidance Handbook* to replace the Handbook, which was approved by the SCAQMD Governing Board in 1993. Therefore, in addition to the Handbook, the analysis for this Project utilized the most recent information provided by the SCAQMD website, as well as consulting with the SCAQMD.

Per the Handbook, short-term (construction) and long-term (operational) emissions from both mobile and stationary sources resulting from the proposed alignment were analyzed and compared to the air district's standards for criteria pollutants.

URBEMIS 2007

Emissions were estimated using the approach included in the URBEMIS model combined with emission factors developed by the California Air Resources Board

and the South Coast Air Quality Management District. The URBEMIS model is used to calculate construction and operational emissions associated with land development projects, and includes Environmental Protection Agency, South Coast Air Quality Management District, and the California Air Resources Board emission factors embedded within it. URBEMIS was developed under the guidance of several California air districts and is available from the South Coast Air Quality Management District's website.

URBEMIS 2007 operational emissions are comprised of two separate sources: area sources (i.e., emissions from space heating and landscape maintenance), and mobile sources. These emissions are calculated for the build-out period and consider future fleet mixes and emission controls.

URBEMIS 2007 was developed to provide meaningful analysis of both short- and long-term impacts, and to encourage mitigation measures during project planning. URBEMIS 2007 uses EMFAC 2007 emission factors (for on-road mobile sources) and OFFROAD 2007 emission factors (for off-road mobile sources).

Where site or project specific data was available, URBEMIS 2007 factors were modified to reflect the information. Where little or no information was available for the Project, default values were selected. For the cumulative analysis, air emissions that occur in the SCAB were utilized.

SCREEN3

A screening risk assessment of diesel-fired toxics from construction haul trucks was performed using the SCREEN3 dispersion model developed by the Environmental Protection Agency's Office of Air Quality Planning and Standards. The SCREEN3 model uses a Gaussian plume dispersion algorithm that incorporates source-related and meteorological factors to estimate pollutant concentration from continuous sources. It is assumed that the pollutant does not undergo any chemical reactions, and that no other removal processes, such as wet or dry deposition, act on the plume during its transport from the source.

Using the aforementioned concentrations obtained from the screening model, the diesel toxic cancer risk can be defined as the following:

$$Risk = \frac{F_{wind} \times EMFAC \times URF_{70\,year\,exposure}}{Dilution}$$

where, *Risk* = is the excess cancer risk (probability in one-million);
Fwind = the frequency of the wind blowing from the exhaust source to the receptor (the default value is 1.0);
EMFAC = the exhaust particulate emission factor (the level from the screening model);
URF70 year exposure = the CARB unit risk probability factor (300 x 10-6, or 300 in a million cancer risk per $\mu g/m^3$ of diesel combustion generated PM10 inhaled in a 70-year lifetime based upon the California Air Resources Board 1999 Staff Report from the Scientific Review Panel [SRP] on Diesel Toxics); and,

Dilution = the atmospheric dilution ratio during source-to-receptor transport (the default value of 1.0 assumes no dilution).

Thus, the risk of cancer to any given person being exposed to a concentration of pollution equal to EMFAC (in $\mu g/m^3$) over a continuous period of 70 years would be:

$$\text{Risk} = 300 \times 10^{-6} \times \text{EMFAC} = 300 \times 10^{-6} \times \text{EMFAC} \quad \text{per person}$$

For the construction-related diesel-fired toxics analysis, an area-source consistent in dimensions with the proposed grading area will be assumed. A simplified terrain model (which is consistent with the area surrounding the Project site) with no building downwash corrections and a worst-case wind direction will be utilized. The quantitative threshold used would be the South Coast Air Quality Management District Hazard Index of one in one million.

Potential impacts associated with the proposed alignment have been identified. The impacts are categorized according to topic, then numbered consecutively under each category. The numbered mitigation measures in Section 5.5.5, MITIGATION MEASURES, directly correspond with the numbered impact statements.

5.5.4 IMPACTS

SHORT-TERM (CONSTRUCTION) EMISSIONS

5.5-1 *Construction of the proposed roadway alignment would result in PM_{10}, $PM_{2.5}$, and NO_x emissions that would exceed SCAQMD's threshold of significance.* ***Significance: Construction-related activities would result in significant and unavoidable short-term PM_{10}, $PM_{2.5}$, and NO_x impacts.***

Impact Discussion: Construction of the proposed roadway alignment would generate short-term air quality impacts during grading and construction operations. The short-term air quality analysis considers cumulative construction emissions in combination with Project emissions. Temporary impacts from the Project and cumulative construction activities would include:

- Particulate (fugitive dust) emissions from clearing and grading activities on-site;
- Exhaust emissions and potential odors from the construction equipment used on-site, as well as the vehicles used to transport materials to and from the site; and
- Exhaust emissions from the motor vehicles of the construction crew.

Construction activities generate the above described emissions due to increases in use of power and vehicle emissions. It should be noted that emissions produced during grading and construction activities are "short-term" in nature as they occur only for the duration of construction. Construction activities are anticipated to take place for 29 months over 8-hour work day shifts.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (also known as PM_{10} and $PM_{2.5}$) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working within the Project vicinity. Fugitive dust emissions are associated with land clearing, ground evacuation, cut and fill operations, and truck travel on unpaved roadways, including demolition activities. Additionally, fugitive dust emissions also vary substantially from day to day, depending on the level of activity, the specific operations, and weather conditions.

Fugitive dust from grading and construction is generally expected to be short-term and would cease upon Project completion. Fugitive dust material is most often comprised of inert silicates, rather than the complex organic particulates released from combustion sources, which are the most harmful to health. Dust, which is larger than 10 microns, generated by such activities usually becomes a local nuisance rather than a serious health problem. However, a serious health concern is the amount of PM_{10} generated as a result of fugitive dust emissions.

PM_{10} and $PM_{2.5}$ is emitted both during construction activities and as a result of wind erosion over exposed soil surfaces. Clearing and grading activities comprise the major sources of construction dust emissions, but traffic and general disturbance of the soil also generates significant dust emissions. PM_{10} and $PM_{2.5}$ emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions and other factors, making quantification difficult. The highest potential for construction dust impacts would occur during the dry late spring, summer, and early fall months when soils are dry. Despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to significantly reduce PM_{10} and $PM_{2.5}$ emissions from construction activities. However, according to the *Air Quality Assessment*, the daily construction emissions would exceed the established thresholds and, therefore, would be considered significant.

Construction Exhaust Emissions

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the Project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting excavated materials from the Project site and fill soils to the Project site. Emitted pollutants would include CO, VOC, SO_x, NO_x, PM_{10}, and $PM_{2.5}$. Standard SCAQMD regulations would be required to maintain all construction equipment, shut down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403. However, construction equipment exhaust would cause an exceedance of the SCAQMD's NO_x thresholds during the entire construction period; refer to Table 5.5-5, PROJECTED CONSTRUCTION EMISSIONS, below. Therefore, a Diesel Reduction Plan shall be implemented to reduce the increased levels of nitrogen oxides generated by on-site construction equipment. However, even with implementation of the Diesel Reduction Plan and compliance with the SCAQMD standards, emissions from the proposed alignment would remain significant and unavoidable.

Table 5.5-5
Projected Construction Emissions

Emissions Source	Pollutant (pounds/day)[1]					
	VOC	NO_X[3]	CO	PM_{10}	$PM_{2.5}$	SO_X
Year 1 (Demolition and Mass Grading)						
Unmitigated Construction Emissions[2]	33.14	307.65	147.24	1,786.35	382.96	0.05
Mitigated Emissions	33.14	307.65	147.24	482.00	110.56	0.05
SCAQMD Threshold	75	100	550	150	55	150
Threshold Exceeded?	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**
Year 2 (Mass Grading and Asphalt Laydown)						
Unmitigated Emissions[2]	33.74	291.04	137.47	1,785.52	382.19	0.05
Mitigated Emissions[3]	33.74	291.04	137.47	481.17	97.78	0.05
SCAQMD Threshold	75	100	550	150	55	150
Threshold Exceeded?	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**
Year 3 (Asphalt Laydown)						
Unmitigated Construction Emissions[2]	9.28	66.45	37.73	4.34	3.98	0.02
Mitigated Emissions	9.28	66.45	37.73	4.34	3.98	0.02
SCAQMD Threshold	75	100	550	150	55	150
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

VOC = volatile organic compounds; NO_X = nitrogen oxides; SO_X = sulfur oxides
CO = carbon monoxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = coarse particulate matter

1 - Calculations include emissions from numerous sources, including grading, construction worker trips, stationary equipment, diesel mobile equipment, and asphalt off-gassing.
2 - Refer to Appendix 15.5 (Air Quality Assessment) for assumptions used in this analysis, including quantified emissions reduction by standard mitigation measure practices). Mitigation includes applying soil stabilizers to inactive areas, replacing groundcover in disturbed areas quickly, watering exposed surfaces twice daily, and covering stockpiles with a tarpaulin.
3 - It should be noted that the URBEMIS 2007 model does not quantify the emissions reduction for NOx associated with recommended mitigation measures. Nonetheless, the mitigated emissions are assumed to exceed the SCAQMD thresholds.

Source: RBF Consulting, *Air Quality Assessment Foothill Parkway Westerly Extension*, August 2007.

Reactive Organic Gases

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates VOC emissions, which are O_3 precursors. According to the *Air Quality Assessment* and as illustrated in Table 5.5-5 above, VOC emissions would be below SCAQMD standards.

Asbestos

Structural. Implementation of the proposed alignment may require the demolition of five on-site structures (refer to Section 5.3, PUBLIC HEALTH AND SAFETY). These structures first appeared on 1968 aerial photographs. Due to the age of the structures (prior to the banned use of asbestos containing materials [ACMs] in 1978), the potential for ACMs to be found on-site is considered likely. Regulations have been established, which require demolition activities to minimize asbestos released into the air. Primarily, this is accomplished through the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), which is enforced by CARB and SCAQMD. The asbestos NESHAP specifies work practices to be followed during the demolition of all structures that contain, or have the potential to contain asbestos.

These work practices have the potential to reduce airborne asbestos to safe levels. Should renovation or demolition of any on-site structures be required, the Project would be subject to the asbestos NESHAP and SCAQMD Rule 1403, *Asbestos Emissions from Demolition/Renovation Activities*. As noted in Mitigation Measure 5.3-1h, an asbestos survey shall be conducted prior to construction activities by an Asbestos Hazard Emergency Response Act and California Occupational Safety and Health Administration certified building inspector to determine the levels of asbestos in structures should renovation or demolition occur. Therefore, no airborne asbestos would be generated during demolition activities.

Naturally Occurring Asbestos. Chrysotile and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults. Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The asbestos contents of many manufactured products have been regulated in the U.S. for a number of years. For example, CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about possible health hazards from activities that disturb rocks and soil-containing asbestos and may result in the generation of asbestos laden dust. These concerns recently led CARB to revise their asbestos limit for crushed serpentinite and ultramafic rock in surfacing applications from five percent to less than 0.25 percent, and to adopt a new rule requiring best practices dust control measures for activities that disturb rock and soil containing Naturally Occurring Asbestos (NOA).

While it is present all over the State of California, naturally occurring asbestos can be found most abundantly in and around Humboldt County, in areas of San Benito and Monterey counties, and in western El Dorado County. The EPA's Pacific Southwest Region has a long history of involvement in assessing and minimizing the risk from asbestos in California, including Alameda, Calaveras, Fresno, Los Angeles, Santa Clara, Santa Cruz, San Benito, and San Mateo counties. According to a general Ultramafic rock formation map created by the State of California Department of Conservation, Division of Mines and Geology, the Project site is not anticipated to be underlain by Ultramafic rock formations.[10] No impacts would occur in this regard.

Diesel Particulate Matter

The proposed alignment is greater than five acres and it is anticipated that grading activities would disturb more than the maximum of five acres per day. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. Since the Project site is greater than five acres and estimated daily grading activities would be approximately six acres, a Localized Significance Thresholds analysis was not performed. However, it should be noted that pursuant to SCAQMD methodology, the dispersion modeling should be performed only for diesel particulate matter.

[10] State of California, Department of Conservation, Division of Mines and Geology, *A General Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos*, August 2000.

As previously stated, the CARB identified diesel engine particulate matter as a toxic air contaminant in 1998. Mobile sources (including trucks, buses, automobiles, trains, ships, and farm equipment) are by far the largest source of diesel emissions. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Diesel exhaust is composed of two phases, either gas or particulate – both contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particulate phase has many different types that can be classified by size or composition. The size of diesel particulates of greatest health concern are fine and ultrafine particles. These particles may be composed of elemental carbon with adsorbed compounds such as organics, sulfates, nitrates, metals, and other trace elements. Diesel exhaust is emitted from a broad range of on- and off-road diesel engines.

Health risk assessments for diesel engine particulate matter are typically conducted for areas that would expose sensitive receptors to high concentrations of diesel engine particulate over a long period of time. Per guidelines of the OEHHA and the California Air Pollution Control Officers Association, estimating the cancer risk from diesel engine particulate is typically not required for construction activities, as they occur for a short period of time and therefore would not measurably increase cancer risk. However, to provide a conservative analysis of construction impacts, a screening analysis was performed using the EPA-approved SCREEN3 model. It should be noted that potential cancer risks and serious respiratory ailments are correlated in the screening analysis. Thus, both are inherently analyzed with the SCAQMD cancer risk threshold.

Construction vehicle pollutant emission generators would consist primarily of haul truck activities such as earthwork haulage, graders, pavers, contractor vehicles, and diesel-electric generators. Construction emissions utilized within the SCREEN3 model were taken from the URBEMIS 2007 construction outputs for the proposed alignment; refer to Table 5.5-5. Note that, for cancer-risk potential, only PM_{10} from diesel exhaust (not the inert silicates from dust) is the single most contributing factor.

According to the URBEMIS 2007 modeling conducted, the highest PM_{10} emissions occur in Year 1 with a total 482.00 lbs/day of PM_{10}, which includes 13.88 lbs/day of diesel exhaust (refer to Appendix 15.5 for modeling output information). It is anticipated that Year 1 would include a majority of the grading and earthwork activities. Typically, the greatest amount of diesel engine particulate matter is generated during grading and earthwork activities. The Year 1 emissions were utilized for the screening analysis as the worst-case scenario. Based upon the on-site emission levels, the aggregate emission rate was input into the SCREEN3 model. This methodology essentially applies all of the diesel emissions over this working area and provides a worst-case assessment of the impacts to sensitive receptors.

The expected diesel construction emission concentrations from the SCREEN3 model are shown below in Table 5.5-6, SCREEN3 PREDICTED EMISSION CONCENTRATIONS. Based upon the model results, the particulate matter concentrations are below the SCAQMD Cancer Risk Threshold of one in one million

for both construction years. Therefore, it is anticipated that impacts would be less than significant for cancer risks from toxic air emissions during construction activities.

Table 5.5-6
SCREEN3 Predicted Emission Concentrations

Construction Year	SCREEN3 Input [1] [(grams/second)/ meters^2]	SCREEN3 Pollutant Concentration Results[2]	Calculated Cancer Risk[3] (in a million)	SCAQMD Cancer Risk Threshold	Significant?
Year 1	1.9×10^{-7}	7.2 µg/m^3	0.00216	**1.0**	No

Notes:
1. SCREEN3 inputs were calculated by converting the diesel engine particulate matter emissions in lbs/day for construction Years 1 in grams per meters squared. The following conversion factors were utilized.
   - 1 day = 86,400 seconds
   - 1 pound = 453.592 grams
   - 1 acre = 4,046.873 square meters
2. Pollutant concentrations based upon SCREEN3 modeling results.
3. The calculated cancer risk was based upon the following equation:

$$Risk = \frac{F_{wind} \times EMFAC \times URF_{70\,year\,exposure}}{Dilution}$$

Risk = is the excess cancer risk (probability in one-million);

F_{wind} = the frequency of the wind blowing from the exhaust source to the receptor (the default value is 1.0);

EMFAC = the exhaust particulate emission factor (the level from the screening model);

$URF_{70\,year\,exposure}$ = the CARB unit risk probability factor (300×10^{-6}, or 300 in a million cancer risk per µg/m^3 of diesel combustion generated PM_{10} inhaled in a 70-year lifetime based upon the California Air Resources Board (CARB) *1999 Staff Report from the Scientific Review Panel [SRP] on Diesel Toxics*); and,

Dilution = the atmospheric dilution ratio during source-to-receptor transport (the default value of 1.0 assumes no dilution).

Source: RBF Consulting, *Air Quality Assessment Foothill Parkway Westerly Extension*, August 2007.

Odors

Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. SCAQMD Rule 1113 limits the amount of volatile organic compounds from architectural coatings and solvents. Following compliance with the SCAQMD rules, no construction activities or materials would create objectionable odors or noxious fumes. Therefore, impacts would be less than significant and no mitigation would be required.

It is anticipated that odors, asbestos, and diesel particulate matter emissions during construction of the proposed alignment would be considered less than significant. However, as shown in Table 5.5-5, above, construction emissions associated with the Foothill Parkway extension would exceed the SCAQMD thresholds for PM_{10}, $PM_{2.5}$, and NO_x, and would therefore be considered significant. Mitigation Measures 5.5-1a through 5.5-1d in Section 5.5.5, MITIGATION MEASURES, are required in order to reduce the pollutant emission levels associated with the short-term construction of the Project. However, the applied mitigation measures would not provide a reduction substantial enough to reduce impacts to less than significant levels. Therefore, PM_{10}, $PM_{2.5}$, and NO_x emissions would exceed the SCAQMD thresholds, resulting in a significant and unavoidable impact.

LONG-TERM (OPERATIONAL) EMISSIONS

5.5-2 *Long-term mobile emissions would occur as a result of Project implementation.* ***Significance: Analysis has concluded that impacts would be less than significant.***

Impact Discussion: Unlike land development projects, which include residential, commercial, or retail developments, transportation-related projects do not directly create vehicle trips. Instead, transportation-related projects typically result in the redistribution of traffic along the local and regional transportation networks. Therefore, the SCAQMD required carbon monoxide (CO) screening to determine if the potential exists for air quality impacts due to the redistribution of traffic associated with the proposed Foothill Parkway extension.

CO is the primary criteria pollutant, and unlike ozone, it is directly emitted from mobile sources. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of its impacts upon local air quality. Comparisons of levels with State and Federal CO standards indicate the severity of the existing concentrations for receptors within the Project area; refer to Table 5.5-7, FEDERAL AND STATE CARBON MONOXIDE STANDARDS, below.

Table 5.5-7
Federal and State Carbon Monoxide Standards

Jurisdiction	Averaging Time	CO Standard
Federal	1 Hour	35 ppm
	8 Hour	9 ppm
State	1 Hour	20 ppm
	8 Hour	9 ppm
ppm = parts per million		
Source: RBF Consulting, *Air Quality Assessment Foothill Parkway Westerly Extension*, August 2007.		

As previously discussed, the SCAB has recently been redesignated as an attainment area for Federal CO standards. The redesignation indicates that the SCAB has not exceeded standards within the last five years. There has been a decline in CO emissions even though vehicle miles traveled (VMT) on U.S. urban and rural roads have increased. On-road mobile source CO emissions have declined 24 percent from 1989 to 1998 despite a 23 percent rise in motor VMT over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997, while VMT increased 18 percent in the 1990s. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection and maintenance (I/M) programs. I/M programs help improve air quality by identifying high-emitting vehicles in need of repair (through visual inspection, emissions testing, and/or the downloading of fault codes from a vehicle's onboard computer) and causing them to be fixed as a prerequisite to vehicle registration within a given non-attainment area.

In order to determine the Project's impacts to the surrounding area, a comparison study was used instead of CO modeling. The previous *2003 Air Quality Management Plan* (2003 AQMP), prepared by the SCAQMD, analyzed and measured the CO levels at the Long Beach Boulevard/Imperial Highway intersection, which was considered the worst-case intersection in the entire SCAB. Data has shown that the monitoring station at the Long Beach Boulevard/Imperial Highway intersection consistently records the highest eight-hour CO concentrations in the SCAB each year. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Los Angeles County, with an average daily traffic (ADT) volume of about 100,000 vehicles per day. Future daily volumes within the Project study area are much lower; refer to Table 5.5-8, AVERAGE DAILY TRAFFIC VOLUMES IN THE PROJECT VICINITY. It should be noted that these areas did not experience an exceedance of the State or Federal thresholds during the AM, PM, or peak hours.[11]

As shown in Table 5.5-8, the area affected by the proposed alignment is expected to experience a much lower CO concentration than the worst-case intersection in the previous 2003 AQMP. Furthermore, the "With Project" scenario indicates that with implementation of the proposed alignment, traffic along other roadway segments within the study area would be reduced. It should also be noted that as the Project would improve vehicular flow and reduce traffic congestion, odor impacts from vehicular exhaust would be less than significant. Due to the direct corollary between exhaust odors and exhaust particulate matter, odors from exhaust are noticeable during periods of long queuing, traffic volumes in excess of 100,000 vehicles per day, or large volumes of heavy truck traffic.[12] Therefore, impacts associated with long-term operational emissions would be considered less than significant.

Table 5.5-8
Average Daily Traffic Volumes in the Project Vicinity

Study Roadway Segment	Year 2010				Year 2025			
	No Project Volume (ADT)	No Project V/C – LOS	With Project Volume (ADT)	With Project V/C – LOS	No Project Volume (ADT)	No Project V/C – LOS	With Project Volume (ADT)	With Project V/C – LOS
6th St west of Smith Ave	28,400	0.53 – A	28,400	0.53 – A	42,700	0.79 – C	42,700	0.79 – C
10th St west of Lincoln Ave	18,400	0.71 – C	18,400	0.71 – C	21,700	0.84 – D	21,700	0.84 – D
Green River Rd west of Palisades Dr	26,600	0.49 – A	26,600	0.49 – A	52,800	0.98 – E	52,800	0.98 – E
Serfas Club Dr south of SR-91	10,600	0.30 – A	10,600	0.30 – A	28,700	0.80 – C	28,700	0.80 – C
Paseo Grande north of Foothill Pkwy	5,700	0.44 – A	5,300	0.41 – A	7,700	0.59 – A	7,400	0.57 – A
Ontario Ave east of Paseo Grande	8,000	0.62 – B	7,300	0.56 – A	11,600	0.89 – D	10,700	0.82 – D
Ontario Ave east of Lincoln Ave	16,300	0.45 – A	16,200	0.45 – A	18,800	0.52 – A	18,800	0.52 – A
Green River Rd west of Paseo Grande	17,900	0.50 – A	17,900	0.50 – A	29,000	0.81 – D	29,000	0.81 – D

[11] South Coast Air Quality Management District, *2003 Air Quality Management Plan, Chapter 4 Revision to the Federal Carbon Monoxide Attainment Demonstration Plan, 2003.*

[12] U.S. Environmental Protection Agency, *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*, March 2006.

Table 5.5-8 (Continued)
Average Daily Traffic Volumes in the Project Vicinity

Study Roadway Segment	Year 2010				Year 2025			
	No Project Volume (ADT)	No Project V/C – LOS	With Project Volume (ADT)	With Project V/C – LOS	No Project Volume (ADT)	No Project V/C – LOS	With Project Volume (ADT)	With Project V/C – LOS
Foothill Pkwy east of Paseo Grande	10,800	0.42 – A	11,000	0.42 – A	21,500	0.83 – D	21,700	0.84 – D
Foothill Pkwy east of Lincoln Ave	10,400	0.40 – A	10,500	0.41 – A	21,800	0.84 – D	21,900	0.85 – D
Upper Dr south of Foothill Pkwy	6,800	0.19 – A	6,800	0.19 – A	7,900	0.22 – A	7,900	0.22 – A

Notes:
1. V/C = Volume to Capacity ratio, ADT = Average Daily Trips, LOS = Level of Service.
Source: RBF Consulting, *Foothill Parkway Extension Traffic Assessment,* June 2007.

Mobile Source Toxic Air Contaminants

As previously mentioned, the proposed alignment is not a trip-generating project such as residential, commercial, or industrial land development project. The SCAQMD currently provides rules and regulations and other policies for Mobile Source Air Toxics (MSATs); however, these policies are oriented for analyzing land use projects. For this analysis, the methodology and information used for analyzing MSATs was obtained from the California Department of Transportation (Caltrans).

MSATs are a subset of the 188 air toxics defined by the FCAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

There are several uncertainties that do not allow quantitative estimates of health effects from MSAT emissions in the Project area. This analysis acknowledges that the Project may result in slightly increased exposure to MSAT emissions in certain locations compared to no project conditions. However, the analysis shows that exposure to MSAT emissions in the future would be less than current conditions. The concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated. However, one can examine MSAT emissions in the Project area and estimate the relative impacts of MSAT emissions under different scenarios. In California, vehicle emissions are estimated using the EMFAC2007 program published by CARB. Although EMFAC2007 does not calculate MSAT emissions, it does calculate VOC (Volatile Organic Compound) emissions. It should be noted that except for Diesel Particulate Matter (DPM), MSAT emissions are proportional to VOC emissions. Therefore, the relative changes in VOC emissions in the Project area are the same as the relative changes in MSAT emissions (except DPM). For DPM, the primary source is Heavy Duty Trucks; therefore, the exhaust PM_{10} emissions for Heavy Duty Trucks is used to calculate DPM concentrations.

The emission factors from EMFAC2007 are pollutant emissions in grams per mile of vehicle travel. Multiplying these emission factors by the number of vehicle miles traveled in the Project area provides an estimate of the total emissions from vehicles traveling through the Project area. Table 5.5-9, ADT VEHICLE MILES TRAVELED, presents the average daily traffic volumes for existing conditions as well as future conditions with and without the Project. The length of each segment is also presented in the table. The traffic volumes and segment length are multiplied together and summed to estimate the vehicle miles traveled through the Project area for each of the scenarios.

Table 5.5-9
ADT Vehicle Miles Traveled

Location/Description	Existing ADT	Year 2010 With Project	Year 2025 With Project	Length (Miles [Approximate])
Existing Foothill Parkway West of Lincoln Avenue	3,600	12,800	24,200	0.29
New Foothill Parkway Extension	N/A	11,000	21,700	2.0
Existing Green River Road west of Paseo Grande	12,900	17,900	29,000	2.0
Totals	16,500	41,700	74,900	**4.29**
Vehicle Miles Traveled (VMT)	**37,785**	**178,893**	**321,321**	
Source: RBF Consulting, *Foothill Parkway Extension Traffic Assessment*, June 2007.				

Vehicle emissions vary by speed. Generally, emissions are higher on a grams per mile basis for slower speeds. For some pollutants, including VOC, emissions increase with speed at speeds greater than 50 miles per hour (mph). Emissions for a range of speeds, from 15 mph to 45 mph, are presented as average speeds for all scenarios.

Table 5.5-10, VOC EMISSIONS ALONG THE PROPOSED ALIGNMENT, presents the estimated VOC emissions from traffic along Foothill Parkway for speeds in five mph increments between 15 mph and 45 mph for the Existing, Year 2010, and Year 2025 scenarios. The table clearly shows a reduction in VOC emissions if one assumes that speeds remain constant. Although the proposed alignment would introduce new traffic within the area, future vehicle emissions are anticipated to significantly decrease over time. As shown in Table 5.5-10, VOC emissions in 2010 and 2025 are projected to be lower than existing conditions for any speed.

Table 5.5-10
VOC Emissions Along the Proposed Alignment

Speed (mph)	Existing (lbs/day)	2010 (lbs/day)	2025 (lbs/day)
15	43.57	25.24	7.66
20	28.82	17.49	5.41
25	22.91	13.74	4.33
30	18.91	11.25	3.67
35	16.24	9.66	3.25
40	14.74	8.75	3.00
45	14.16	8.33	2.92
Source: EMFAC 2007			

Table 5.5-11, DPM EMISSIONS ALONG FOOTHILL PARKWAY, presents estimates of DPM emissions from traffic along Foothill Parkway for speeds in five mph increments between 15 mph and 45 mph for the five scenarios being analyzed. Similar to VOC emissions provided in Table 5.5-11, DPM would also decrease in future buildout years. Although the proposed alignment would introduce a new roadway within the area, emissions associated with DPM are anticipated to significantly decrease over time.

Table 5.5-11
DPM Emissions Along Foothill Parkway

Speed (mph)	Existing (lbs/day)	2010 (lbs/day)	2025 (lbs/day)
15	43.57	5.50	3.92
20	28.82	4.00	2.92
25	22.91	3.17	2.25
30	18.91	2.67	1.92
35	16.24	2.33	1.67
40	14.74	2.08	1.50
45	14.16	2.00	1.42
Source: EMFAC 2007			

CARB has found that DPM poses the greatest cancer risks among all identified air toxics. Diesel trucks contribute more that half of the total diesel combustion sources. However, CARB has adopted a Diesel Risk Reduction Plan (DRRP) with control measures that would reduce the overall DPM emissions by approximately 85 percent from 2000 to 2020. These reduction measures are not reflected in the EMFAC2007 emission factors used in the analysis above. It should also be noted that the EPA issued a Final Rule on *Controlling Emissions of Hazardous Air Pollutants from Mobile Sources*, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the FCAA. In its rule, the EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Therefore, even with a 64 percent increase in VMT between years 2000 and 2020, roadway projects will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by up to 65 percent, as well as reducing highway diesel particulate matter emissions by 87 percent. Thus, the EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to control MSATs. The EPA is preparing a subsequent rule under the authority of Section 202(l) of the FCAA that will address these issues and make adjustments to the primary and secondary MSATs.

Based upon the control measures incorporated into CARB's DRRP and the EPA's Final Rule on *Controlling Emissions of Hazardous Air Pollutants from Mobile Sources*, future DPM emissions would be reduced beyond what is indicated in Table 5.5-10 and Table 5.5-11. In addition, total toxic risk from diesel exhaust may only be exposed for a much shorter duration. Furthermore, roadways that have daily traffic

volumes below 140,000 to 150,000 average daily trips[13] do not contain enough traffic to generate particulate matter that would result in an adverse impact. Therefore, impacts would be less than significant in this regard.

CONFORMITY WITH REGIONAL PLANS

5.5-3 *The proposed roadway alignment would be consistent with the implementation of the Air Quality Management Plan (AQMP).* ***Significance: Less than significant impact.***

Impact Discussion: As noted under the *Standards of Significance* discussion, above, a potentially significant impact to air quality would occur if the Project would conflict with or obstruct the implementation of the applicable air management or attainment quality plan. Although the proposed alignment would represent an incremental negative impact to air quality in the SCAB, the primary concern is that the project-related impacts have been properly anticipated in the regional air quality planning process, and reduced whenever feasible. Therefore, it is necessary to assess the Project's consistency with the AQMP.

The SCAQMD Handbook states that the purpose of assessing the Project's consistency with the latest AQMP is to determine its consistency with the assumptions and objectives of the regional air quality plans. The most recent would need to be found consistent with the 2007 AQMP, which has been recently adopted by the SCAQMD. If a project is found to interfere with the region's ability to comply with Federal and State air quality standards, local governments then need to consider project modifications or provide mitigation measures to eliminate the inconsistency of the project plans. In order for a project to be considered "consistent" with the latest AQMP, the project must be consistent with the goals, objectives, and assumptions in the respective plan to achieve the Federal and State air quality standards.

Per the Handbook, there are two main indicators of a project's consistency with the AQMP:

- Whether the project would increase the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of the air quality standards or the interim emission reductions specified in the AQMP; and
- Whether the project would exceed the AQMP's assumptions for 2020 or yearly increments, based on the year of project build-out and phase.

Per SCAQMD methodology, the first criteria applies to long-term operational emissions. Short-term construction related emissions are not reflected in the AQMP consistency analysis as these emissions are short-term and transitory in nature, and thus do not have the inherent ability to cause a severe air quality violation. On an operational basis, the project is a roadway extension and, as it is an "infrastructure

[13] Federal Highways Administration technical staff determined that this range of average daily traffic would be roughly equivalent to the Clean Air Act definition of a major Hazardous Air Pollutant (HAP) source (i.e., 25 tons per year [tpy] for all HAPs or 10 tpy for any single HAP). Source: U.S. Department of Transportation Federal Highway Administration, *Interim Guidance on Air Toxic Analysis in NEPA Documents*, February 2006.

project," is classified as an indirect source by the SCAQMD[14]. As such, direct emissions from the project are not quantified as it is not a trip generating project (rather vehicle trips are redistributed, new trips are not created). Thus, alternate means were utilized to analyze the project (i.e., localized air quality emissions and MSATs). The results of such analyses concluded that an impact would not occur.

The proposed westerly extension of Foothill Parkway has been master planned by both the City and the County (in the General Plans) since the 1980's, as both agencies recognized the desirability of developing a high-grade arterial which would facilitate continuous east/west travel across the City. Therefore, both the County and the City have identified the proposed westerly extension of Foothill Parkway, as well as its consistency within the Circulation Element of both General Plans. The proposed westerly extension of Foothill Parkway is also included in the *South Corona Community Facilities Plan* (CFP), which was adopted by the City of Corona in 1989 to establish land use policies and infrastructure requirements for the southern portion of the City, located south of Ontario Avenue. According to the CFP, the City is required to develop a precise alignment and further evaluate potential design issues. Therefore, the proposed alignment would be consistent with the AQMP and would result in less than significant impacts.

CUMULATIVE IMPACTS

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

The City of Corona is subject to the SCAQMD's Air Quality Management Plan (AQMP). Additionally, the City is located within the Riverside County subregion of the *Regional Comprehensive Plan and Guide* (RCPG), which governs population growth. The *General Plan* is consistent with the RCPG, and since the RCPG is consistent with the AQMP, growth under the *General Plan* is consistent with the AQMP. Therefore, development in the City would not conflict or obstruct the AQMP and cumulative impacts would not result.

The proposed westerly extension of Foothill Parkway is identified within the General Plan. Therefore, the proposed Project would not conflict or obstruct implementation of the AQMP and would not contribute to cumulative impacts.

Level of Significance Before Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

Level of Significance After Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

[14] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993. Chapter 9, Emission Calculation Procedures.

Mitigation Measures: None are required.

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

Threshold: 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 standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Threshold: Exposes sensitive receptors to substantial pollutant concentrations.

Construction Impacts

The SCAQMD neither recommends quantified analyses of cumulative construction or operational emissions, nor does it provide separate methodologies or thresholds of significance to be used to assess cumulative construction or operational impacts. Instead, the SCAQMD recommends that a project's potential contribution to cumulative impacts should be assessed using the same significance criteria as those for project-specific impacts. Therefore, individual development projects that generate construction-related or operational emissions that exceed the SCAQMD recommended daily thresholds for project-specific impacts would also cause a cumulative considerable increase in emissions for those pollutants for which the SCAB is nonattainment.

Of the projects that have been identified within the Project study area, there are a number of related projects that have not been built or are currently under construction. Since project applicants have no control over the timing or sequencing of the related projects, any quantitative analysis to ascertain the daily construction emissions that assumes multiple, concurrent construction would be speculative.

According to the City's *General Plan*, the City anticipates several construction projects each year. The total amount of construction and development within the City would exceed the SCAQMD's recommended thresholds of significance, resulting in a cumulative impact.

With respect to the proposed Project's construction-period air quality emissions and cumulative SCAB conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2007 AQMP pursuant to FCAA mandates. As such, the proposed alignment would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures. In addition, the proposed alignment would comply with adopted 2007 AQMP emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted 2007 Plan emissions control measures) would also be imposed on construction projects throughout the SCAB, which would include each of the related projects mentioned above.

Although compliance with SCAQMD rules and regulations would reduce construction-related impacts, the project-related construction emissions have been concluded to be significant and unavoidable for NO_X, PM_{10}, and $PM_{2.5}$ emissions during the excavation, demolition, and grading phase. Thus, it can be reasonably inferred that the project-related construction activities, in combination with those from other projects in the area, would deteriorate the local air quality and lead to cumulative construction-related impacts.

Level of Significance Before Mitigation –

Overall Cumulative Impact: Potentially Significant Impact.

Project Cumulative Contribution: Potentially Significant Impact.

Level of Significance After Mitigation –

Overall Cumulative Impact: Significant and Unavoidable Impact.

Project Cumulative Contribution: Significant and Unavoidable Impact.

Mitigation Measures: 5.5-1a though 5.5-1d.

Cumulative Operational Impacts

Due to the SCAB's nonattainment status for O_3 and PM_{10} for both Federal and State air quality standards, and $PM_{2.5}$ for Federal standards, additional emissions in excess of SCAQMD thresholds under a long-term condition for VOC, NO_x, CO, and PM_{10} would be considered significant and unavoidable for cumulative impacts. However, the proposed alignment would not exceed the SCAQMD's operational emission thresholds.

Due to the recent increase in population and the demand for land use intensification within the City of Corona as well as adjacent communities, increasing pressure on the City's arterial street system has occurred. As a result, congestion on State Route 91, Interstate 15, and at the interchange of the two freeways has resulted in a significant amount of regional "by-pass" traffic using City streets to avoid freeway congestion. The following are Project objectives that shall alleviate the above-stated congestion conditions:

- Minimize congestion on the local circulation network and provide a continuous connection from Lincoln Avenue to Green River Road;
- Accommodate planned circulation needs by providing the extension of Foothill Parkway consistent with the *City of Corona General Plan* Circulation Element;
- Provide a roadway design that is sensitive to the environmental resources in the study area and minimizes, to the extent feasible, impacts to sensitive plant and wildlife species, while providing adequate geometric design to minimize safety hazards and maximize operational efficiency;

- Develop a roadway design that is compatible with the provisions of the Western Riverside County Multi-Species Habitat Conservation Plan;
- Improve air quality in the SCAB by providing system improvements that would reduce traffic congestion, and thereby the amount of pollutants generated;
- Avoid impacts to the Cleveland National Forest; and
- Implement circulation improvements in south Corona to provide public service access (i.e., emergency response) to existing and planned uses in the area.

The proposed alignment would be implemented in order to improve traffic circulation within the area, thereby improving air quality. The proposed alignment would not result in CO hotspots and would also be consistent with the SCAQMD AQMP, as discussed above in the Long-Term (Operational) Emissions and the Consistency with Regional Plans Impact sections. Therefore, operational cumulative impacts would be less than significant.

Global Climate Change

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change agreement with the goal of controlling greenhouse gas emissions, including methane. As a result, the Climate Change Action Plan (CCAP) was developed to address the reduction of greenhouse gases in the United States. The CCAP consists of more than 50 voluntary programs. Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere (i.e., chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform) were to be phased out by year 2000.

On June 1, 2005, the Governor of California signed Executive Order S-3-05, which established the following greenhouse gas emission reduction targets for the State of California:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

Executive Order S-3-05 also recognized the importance of preparedness, in that it directed the Secretary of the California Environmental Protection Agency (CA EPA) to lead an effort to evaluate the impacts of climate change on California and to examine adaptation measures that would best prepare the State to respond to the adverse consequences of climate change. In response to S-3-05, the California Climate Action Team was convened, which was comprised of representatives from CA EPA, CARB, Integrated Waste Management (IWM), California Energy Commission (CEC), and several other State departments. The California Climate Action Team prepared the *Climate Action Team Report for Governor*

Schwarzenegger and the Legislature (dated March 2006), which provides an overview of scientific evidence regarding climate change as well as potential effects on California. The report also provides recommendations regarding strategies the State should pursue to reduce climate change emissions.

In addition to Executive Order S-3-05, the California Legislature passed Assembly Bill 32 (Global Warming Solutions Act) on August 31, 2006. It requires the State's global warming emissions to be reduced to 1990 levels by 2020. The reduction would be accomplished through an enforceable statewide cap on global warming emissions that would be phased in starting in 2012. On or before June 30, 2007, the CARB is required to publish a list of discrete greenhouse gas emissions that can be implemented. Emission reductions shall include carbon sequestration projects and best management practices that are technologically feasible and cost-effective. However, Assembly Bill 32 does not provide thresholds or methodologies for analyzing a project's impacts regarding global climate change. Assembly Bill 32 (AB-32) primarily provides a timeframe for establishing plans, policies, and studies to address global climate change.

The United States Bureau of Transportation Statistics suggests that an average United States "trip" is about 11.4 miles. The amount of gasoline consumed per year can be estimated by multiplying the total miles traveled per project trip by the United States fuel economy average of 25 miles per gallon. Combustion of one gallon of gasoline produces about 19 pounds of carbon dioxide. One of the main strategies to reduce greenhouse gas emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in greenhouse gas emissions.

Global Climate Change impacts are a result of cumulative emissions from anthropogenic activities in the region, the state, and the world. A reduction in vehicle miles traveled results in a decrease in fuel consumption and a decrease in greenhouse gas emissions. It should be noted that modeling and gauging the impacts associated with an increase in greenhouse gases, including carbon dioxide levels and the effect on climate change, would be purely speculative. No federal, state or regional regulatory agency has provided methodology or criteria for greenhouse gas emission and climate change impact analysis. Two of the most effective means to reduce greenhouse gas emissions from transportation sources are outside of the direct control of the local jurisdictions. The most direct approach to improving the energy efficiency of the transportation sector is to increase vehicle fuel economy in new cars, light and heavy-duty trucks. The City and County does not control the fuel economy standards, as the EPA and CARB govern this area.

As previously mentioned, the proposed westerly extension of Foothill Parkway has been master planned by both the City and the County (in the General Plans) since the 1980s, as both agencies recognized the desirability of developing a high-grade arterial which would facilitate continuous east/west travel across the City as well as provide much needed access to State Route 91. As indicated in Table 5.5-8, the proposed alignment is anticipated to alleviate traffic along surrounding roadways

within the Project study area. The purpose of the proposed alignment is to improve both existing and future mobility and reduce congestion.

Both the County and the City have identified the proposed westerly extension of Foothill Parkway as well as its consistency within the Circulation Element of both General Plans. The proposed westerly extension of Foothill Parkway is also included in the South Corona Community Facilities Plan (CFP), which was adopted by the City of Corona in 1989 to establish land use policies and infrastructure requirements for the southern portion of the City, located south of Ontario Avenue. According to the CFP, the City is required to develop a precise alignment and further evaluate potential design issues. Therefore, the proposed alignment would be consistent with the AQMP and would result in less than significant impacts.

In conclusion, the proposed alignment would improve the operational deficiencies that would result from increased traffic demand and congestion from forecasted growth. Additionally, there is significant uncertainty involved in making predictions of the extent of which the Project operations would have on greenhouse gas emissions and global climate change. As the proposed alignment would not directly generate traffic (additional vehicle miles traveled), it would not result in a significant increase of greenhouse gases beyond “no project” conditions.

Level of Significance Before Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

Level of Significance After Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

Mitigation Measures: None are required.

Threshold: Create objectionable odors affecting a substantial number of people.

Construction activities in accordance with the *General Plan* and the proposed Project have the potential to generate airborne odors due to the construction equipment. However, these emissions would occur during daytime hours and would be isolated to the vicinity of the construction site. Therefore, a limited number of people would be impacted and cumulative impacts would not occur.

Level of Significance Before Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

Level of Significance After Mitigation –

Overall Cumulative Impact: Less Than Significant Impact.

Project Cumulative Contribution: Less Than Significant Impact.

Mitigation Measures: None are required.

5.5.5 MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements provided in the Impacts Subsection for the proposed alignment:

SHORT-TERM (CONSTRUCTION) EMISSIONS

5.5-1a Prior to approval of the Project plans and specifications, the Public Works Director, or his designee, shall confirm that the plans and specifications stipulate that, in compliance with SCAQMD Rule 403, excessive fugitive dust emissions shall be controlled by regular watering or other dust preventive measures, as specified in the SCAQMD's Rules and Regulations. In addition, SCAQMD Rule 402 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Implementation of the following measures would reduce short-term fugitive dust impacts on nearby sensitive receptors:

- All active portions of the construction site shall be watered to prevent excessive amounts of dust;
- On-site vehicles speed shall be limited to 15 miles per hour (mph);
- All on-site roads shall be paved as soon as feasible, watered periodically, or chemically stabilized;
- All material excavated or graded shall be sufficiently watered to prevent excessive amounts of dust. Watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is done for the day;
- If dust is generated and visibly occurs beyond the site boundaries, clearing, grading, earth moving, or excavation activities that generate dust shall cease during periods of high winds (i.e., greater than 25 mph averaged over one hour); and
- All material transported off site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust.

5.5-1b Prior to approval of the Project plans and specifications, the Public Works Director shall confirm that the plans and specifications stipulate that, in compliance with SCAQMD Rule 403, ozone precursor emissions from

construction equipment vehicles shall be controlled by maintaining equipment engines in good condition and in proper tune per manufacturer's specifications, to the satisfaction of the Resident Engineer. The City inspector shall be responsible for ensuring that contractors comply with this measure during construction.

5.5-1c Prior to approval of the Project plans and specifications, the Director of Field Services, or his designee, shall confirm that the construction bid packages include a separate "Diesel Fuel Reduction Plan." This plan shall identify the actions to be taken to reduce diesel fuel emissions during construction activities (inclusive of grading and excavation activities). Reductions in diesel fuel emissions 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; and c) other appropriate measures with equal or better efficiency (as determined in consultation with the South Coast Air Quality Management District). Prior to the issuance of a grading permit, the Diesel Fuel Reduction Plan shall be filed with the City of Corona. The Diesel Fuel Reduction Plan shall include the following provisions:

- All diesel fueled off-road construction equipment shall be CARB certified or use post-combustion controls that reduce pollutant emissions to the same level as CARB certified equipment. CARB certified off-road engines are engines that are three years old or less and comply with lower emission standards. Post-combustion controls are devices that are installed downstream of the engine on the tailpipe to treat the exhaust. These devices are now widely used on construction equipment and are capable of removing over 90 percent of the PM_{10}, carbon monoxide, and volatile organic compounds from engine exhaust, depending on the specific device, sulfur content of the fuel, and specific engine type. The most common and widely used post-combustion control devices are particulate traps (i.e., soot filters), oxidation catalysts, and combinations thereof.

- All diesel fueled on-road construction vehicles shall meet the emission standards applicable to the most current year to the greatest extent possible. To achieve this standard, new vehicles shall be used or older vehicles shall use post-combustion controls that reduce pollutant emissions to the greatest extent feasible.

- The effectiveness of the latest diesel emission controls is highly dependant on the sulfur content of the fuel. Therefore, diesel fuel used by on-road and off-road construction equipment shall be low sulfur (>15 ppm) or other alternative low polluting diesel fuel formulation.

5.5-1d All trucks that are to haul excavated or graded material on-site shall comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads.

LONG-TERM (OPERATIONAL) EMISSIONS

5.5-2 No mitigation measures are required.

CONFORMITY WITH REGIONAL PLANS

5.5-3 No mitigation measures are required.

CUMULATIVE IMPACTS

Short-Term Cumulative Impacts

Refer to Mitigation Measures 5.5-1a though 5.5-1d.

Cumulative Operational Impacts

No mitigation measures are required.

5.5.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Despite compliance with recommended Mitigation Measures 5.5-1a through 5.5-1d, NO_x, PM_{10}, and $PM_{2.5}$ emissions during construction would remain above SCAQMD thresholds. Cumulative construction impacts related to regional emissions would also be significant and unavoidable.

If the City of Corona approves the Foothill Parkway Westerly Extension Project, the City shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.