4.1 AIR QUALITY

This section examines the degree to which the proposed projects could cause significant adverse changes to air quality. Both short-term construction and long-term operational emissions are discussed in this section. This analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the quantity of pollutants released into the air, measured in pounds per day (ppd). "Concentrations" refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). Calculations are presented in Appendix B.

Pollutants and Effects

Criteria air pollutants are defined as pollutants for which the federal and State governments have established ambient air quality standards for outdoor concentrations to protect public health. The federal and State standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), particulate matter ten microns or less in diameter (PM_{10}), and lead (Pb). These pollutants are discussed below.

Carbon Monoxide (CO). CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft and trains. In urban areas such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follows the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February.[1] The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

Ozone(O_3). O_3 is a colorless gas that is formed in the atmosphere when reactive organic gases (ROG), which includes volatile organic compounds (VOC) and nitrogen oxides (NO_X) react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of ROG and NO_X, components of O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O_3 formation. Ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures and cloudless skies. The greatest source of smog-producing gases is the automobile. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue and some immunological changes.

Nitrogen Dioxide(NO_2). NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10}. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a relationship between NO_2 and

[1]Inversion is an atmospheric condition in which a layer of warm air traps cooler air near the surface of the earth, preventing the normal rising of surface air.

chronic pulmonary fibrosis. Some increase of bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 ppm.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter, or $PM_{2.5}$, is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., motor vehicles, power generation and industrial facilities), residential fireplaces and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X and VOC. Inhalable particulate matter, or PM_{10}, is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates and nitrates can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body. These substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

Sulfur Dioxide(SO_2). SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries. Generally, the highest levels of SO_2 are found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.

Lead(Pb). Pb in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturers of batteries, paint, ink, ceramics, ammunition and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95 percent. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities have become lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time and growth.

Toxic Air Contaminants (TACs). TACs are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical; its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are

emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as PM_{10} and $PM_{2.5}$ or as vapors (gases). TACs include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

The public's exposure to TACs is a significant public health issue in California. The Air Toxics "Hotspots" Information and Assessment Act is a state law requiring facilities to report emissions of TACs to air districts. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting health risks.

REGULATORY FRAMEWORK

The Federal Clean Air Act (CAA) governs air quality in the United States. In addition to being subject to the requirements of CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). At the federal level, CAA is administered by the United States Environmental Protection Agency (USEPA). In California, the CCAA is administered by the California Air Resources Board (CARB) at the State level and by the air quality management districts and air pollution control districts at the regional and local levels.

Federal

United States Environmental Protection Agency (USEPA). CAA governs air quality in USEPA is responsible for enforcing the CAA. USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). NAAQS are required under the 1977 CAA and subsequent amendments. USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. USEPA has jurisdiction over emission sources outside State waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by CARB.

As required by the CAA, NAAQS have been established for seven major air pollutants: CO, NO_2, O_3, $PM_{2.5}$, PM_{10}, SO_2, and Pb. The CAA requires USEPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The federal standards are summarized in **Table 4.1-1**. The USEPA has classified the South Coast Air Basin (Basin) as maintenance for CO and nonattainment for O_3, $PM_{2.5}$, and PM_{10}.

Clean Air Act (CAA). Actions taken by federal agencies could affect state, tribal, and local agencies' ability to attain and maintain the NAAQS. The 1990 amendments to CAA clarified and strengthen the provisions in Section 176 (c), which requires the USEPA to create rules that would ensure that federal actions would not violate the NAAQS or interfere with the purpose stated in State Implementation Plan (SIP), Transportation Implementation Plan (TIP), or Facility Implementation Plan (FIP).

TABLE 4.1-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS FOR THE SOUTH COAST AIR BASIN

		California		Federal	
Pollutant	Averaging Period	Standards	Attainment Status	Standards	Attainment Status
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	Nonattainment	--	--
	8-hour	0.070 ppm (137 µg/m^3)	n/a	0.075 ppm (147 µg/m^3)	Nonattainment
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	Nonattainment	150 µg/m^3	Nonattainment
	Annual Arithmetic Mean	20 µg/m^3	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	--	35 µg/m^3	Nonattainment
	Annual Arithmetic Mean	12 µg/m^3	Nonattainment	15.0 µg/m^3	Nonattainment
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Maintenance
	8-hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Maintenance
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	Attainment	100 ppb (188 µg/m^3)	--
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Attainment	53 ppb (100 µg/m^3)	Attainment
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 µg/m^3)	Attainment	75 ppb (196 µg/m^3)	Attainment
	24-hour	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3)	Attainment
Lead (Pb)	30-day average	1.5 µg/m^3	Attainment	--	--
	Calendar Quarter	--	--	0.15 µg/m^3	Attainment

n/a = not available
SOURCE: CARB, *Ambient Air Quality Standards*, February 7, 2012.

State

California Air Resources Board (CARB). In addition to being subject to the requirements of CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). In California, the CCAA is administered by CARB at the State level and by the air quality management districts and air pollution control districts at the regional and local levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the CAA, administering the CCAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. CARB regulates mobile air pollution sources, such as motor vehicles. CARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB established passenger vehicle fuel specifications, which became effective in March 1996. CARB oversees the functions of local air pollution control districts and air quality management districts, which, in turn, administer air quality activities at the regional and county levels. The State standards are summarized in **Table 4.1-1**.

The CCAA requires CARB to designate 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 Los Angeles County portion of the Basin is designated as a nonattainment area for O_3, $PM_{2.5}$, PM_{10}, and NO_2.[2]

Toxic Air Contaminants (TACs). CARB's Statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" [Health and Safety Code Section 39666(f)]. The Toxic Air Contaminant Identification and Control Act also requires CARB to use available information gathered from the Air Toxics "Hot Spots" Information and Assessment Act program to include in the prioritization of compounds.

California has established a two-step process of risk identification and risk management to address the potential health effects from air toxic substances and protect the public health of Californians. During the first step (identification), CARB and the Office of Environmental Health Hazard Assessment (OEHHA) determine if a substance should be formally identified as a TAC in California. During this process, CARB and the OEHHA staff draft a report that serves as the basis for this determination. CARB staff assesses the potential for human exposure to a substance and the OEHHA staff evaluates the health effects. After CARB and the OEHHA staff hold several comment periods and workshops, the report is then submitted to an independent, nine-member Scientific Review Panel (SRP), who reviews the report for its scientific accuracy. If the SRP approves the report, they develop specific scientific findings which are officially submitted to CARB. CARB staff then prepares a hearing notice and draft regulation to formally identify the substance as a TAC. Based on the input from the public and the information gathered from the report, the CARB decides whether to identify a substance as a TAC. In 1993, the California Legislature amended the Toxic Air Contaminant Identification and Control Act by requiring CARB to identify 189 federal hazardous air pollutants as State TACs.

In the second step (risk management), CARB reviews the emission sources of an identified TAC to determine if any regulatory action is necessary to reduce the risk. The analysis includes a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk.

The Air Toxics "Hot Spots" Information and Assessment Act (Health and Safety Code Section 44360) supplements the Toxic Air Contaminant Identification and Control Act by requiring a Statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. The "Hot Spots" Act also requires facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

California's Diesel Risk Reduction Program. CARB identified particulate emissions from diesel-fueled engines (diesel PM) TACs in August 1998. Following the identification process, the CARB was required by law to determine if there is a need for further control, which led to the risk management phase of the program.

[2]CARB, Area Designation Maps, available at http://www.arb.ca.gov/desig/adm/adm.htm, accessed on March 8, 2012.

For the risk management phase, CARB formed the Diesel Advisory Committee to assist in the development of a risk management guidance document and a risk reduction plan. With the assistance of the Advisory Committee and its subcommittees, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles and the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines. The Diesel Advisory Committee approved these documents on September 28, 2000, paving the way for the next step in the regulatory process: the control measure phase.

During the control measure phase, specific Statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles have and continue to be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

Regional

Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). While Southern California is a leader in reducing emissions, and ambient levels of air pollutant improving, the Southern California Association of Governments (SCAG) region continues to have the worst air quality in the nation. The SCAG has prepared the 2012-2035 RTP/SCS, which includes a strong commitment to reduce emissions from transportation sources to comply with SB 375. One of goals listed in the 2012-2035 RTP/SCS to reduce air pollution is to encourage active transportation (i.e., non-motorized transportation such as bicycling). SCAG has supported the following policies and actions related to active transportation to help the region confront congestion and mobility issues and consequently improve air quality:

- Transportation Demand Management (TDM) strategies include integrating bicycling through folding bikes on buses programs, triple racks on buses, and dedicated racks on light and heavy rail vehicles;
- Encourage and support local jurisdictions to develop "Active Transportation Plans" for their jurisdiction if they do not already have one;
- Expand Compass Blueprint program to support member cities in the development of bicycle plans;
- Expand the Toolbox Tuesday's program to encourage local jurisdictions to direct enforcement agencies to focus on bicycling and walking safety to reduce multimodal conflicts;
- Support local advocacy groups and bicycle-related businesses to provide bicycle-safety curricula to the general public;
- Encourage children, including those with disabilities, to walk and bicycle to school;
- Encourage local jurisdictions to adopt and implement the proposed SCAG Regional Bikeway Network; and
- Support local jurisdictions to connect all of the cities within the SCAG region via bicycle facilities.

Local

South Coast Air Quality Management District (SCAQMD). The 1977 Lewis Air Quality Management Act created the SCAQMD to coordinate air quality planning efforts throughout Southern California. This Act merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under this Act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, the SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain State and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary sources, area sources, point sources, and certain mobile source emissions. The SCAQMD is also responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The SCAQMD monitors air quality within the project area. The SCAQMD has jurisdiction over an area of 10,743 square miles, consisting of Orange County; the non-desert portions of Los Angeles, Riverside, and San Bernardino counties; and the Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air Basin. The Basin is a subregion of the SCAQMD and covers an area of 6,745 square miles. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin is bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino and San Jacinto Mountains to the north and east; and the San Diego County line to the south (**Figure 4.1-1**).

Air Quality Management Plan (AQMP). All areas designated as nonattainment under the CCAA are required to prepare plans showing how the area would meet the State air quality standards by its attainment dates. AQMP is the SCAQMD plan for improving regional air quality. It addresses CAA and CCAA requirements and demonstrates attainment with State and federal ambient air quality standards. The AQMP is prepared by SCAQMD and SCAG. The AQMP provides policies and control measures that reduce emissions to attain both State and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the Basin must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations.

The SCAQMD is currently developing the 2012 AQMP to continue the progression toward clean air and compliance with State and federal requirements. It includes a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on- and off-road mobile sources and area sources. The 2012 AQMP proposes attainment demonstration of the federal 24-hour $PM_{2.5}$ standard by 2014 in the Basin through adoption of all feasible measures while incorporating current scientific information and meteorological air quality models. It also updates the USEPA approved 8-hour O_3 control plan with new commitments for short-term NO_X and VOC reductions. The 2012 AQMP also addresses several State and federal planning requirements. The 2012 AQMP builds upon the approach taken in the 2007 AQMP, adopted on June 1, 2007, for the attainment of federal PM and O_3 standards, and highlights the significant amount of reductions needed and the urgent need to engage in interagency coordinated planning to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under the CAA.

Toxic Air Contaminants (TACs). The SCAQMD has a long and successful history of reducing air toxics and criteria emissions in the Basin. SCAQMD has an extensive control program, including traditional and innovative rules and policies. These policies can be viewed in the SCAQMD's *Air Toxics Control Plan for the Next Ten Years* (March 2000). To date, the most comprehensive study on air toxics in the Basin is the Multiple Air Toxics Exposure Study (MATES-III), conducted by the SCAQMD. The monitoring program measured more than 30 air pollutants, including both gases and particulates. The monitoring study was accompanied by a computer modeling study in which SCAQMD estimated the risk of cancer from breathing toxic air pollution throughout the region based on emissions and weather data. MATES-III found that the cancer risk in the region from carcinogenic air pollutants ranges from about 870 in a million to 1,400 in a million, with an average regional risk of about 1,200 in a million.

An addendum to the plan was completed in March 2004 that included a status update on the implementation of the various mobile and stationary source strategies. Revised projections were based on accomplishments thus far and a new inventory was included to reflect the updated 2012 AQMP.

LEGEND:

South Coast Air Basin

State of California

SOURCE: California Air Resources Board, State and Local Air Monitoring Network Plan, October 1998

Approx. Scale

N

0 75 150 MILES

FIGURE 4.1-1

SOUTH COAST AIR BASIN

EXISTING AIR QUALITY

Local Climate

The mountains and hills within the Basin contribute to the variation of rainfall, temperature, and winds throughout the region. Within the project site and its vicinity, the average wind speed, as recorded at the Downtown Los Angeles Wind Monitoring Station, is five miles per hour, with calm winds occurring approximately eight percent of the time. Wind in the vicinity of the project site predominately blows from the west.[3]

The annual mean temperature near the project site is 74.1°F. The project area experiences an average winter temperature of 67.1°F and an average summer temperature of 80.9°F. Total precipitation in the project area averages 14.9 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation averages 9.0 inches during the winter, 3.75 inches during the spring, 2.0 inches during the fall, and less than one inch during the summer.[4]

Air Pollution Climatology

The proposed projects are located within the Los Angeles County portion of the Basin. Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the Basin.

The Basin is in an area of high air pollution potential due to its climate and topography. The general region lies in the semi-permanent high pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of its perimeter. The mountains and hills within the area contribute to the variation of rainfall, temperature, and winds throughout the region.

The Basin experiences frequent temperature inversions. Temperature typically decreases with height. However, under inversion conditions, temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere. This interaction creates a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and NO_2 react under strong sunlight, creating smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to CO and NO_2 emissions. CO concentrations are generally worse in the morning and late evening (around 10:00 p.m.). In the morning, CO levels are relatively high due to cold temperatures and the large number of cars traveling. High CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO emissions are produced almost entirely from automobiles, the highest CO concentrations in the Basin are associated with heavy traffic. NO_2 concentrations are also generally higher during fall and winter days.

[3]SCAQMD, *Meteorological Data*, Available at:http://www.aqmd.gov/smog/metdata/MeteorologicalData.html, accessed on September 6, 2012.

[4]Western Regional Climate Center, *Historical Climate Information*, Available at: http://www.wrcc.dri.edu, accessed on September 6, 2012.

Local Climate

The mountains and hills within the Basin contribute to the variation of rainfall, temperature, and winds throughout the region. Within the proposed alignment, the average wind speed, as recorded at the Downtown Wind Monitoring Station, is approximately five miles per hour, with calm winds occurring 7.9 percent of the time. Wind in the vicinity of the proposed alignment predominately blows from the southwest.[5]

The annual average temperature in the project area is 74.1°F.[6] The project area experiences an average winter temperature of 67.1°F and an average summer temperature of 80.9°F. Total precipitation in the project area averages approximately 14.9 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation averages 9.0 inches during the winter, 3.8 inches during the spring, 2.0 inches during the fall, and less than one inch during the summer.[7]

Air Monitoring Data

The SCAQMD monitors air quality conditions at 38 locations throughout the Basin. The proposed projects are located across a wide area of the City of Los Angeles. Typical air quality conditions have been represented by the Los Angeles-North Main Street Monitoring Station located on 1630 North Main Street (**Figure 4.1-2**). Criteria pollutants monitored at the Los Angeles-North Main Street Monitoring Station include O_3, CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2.

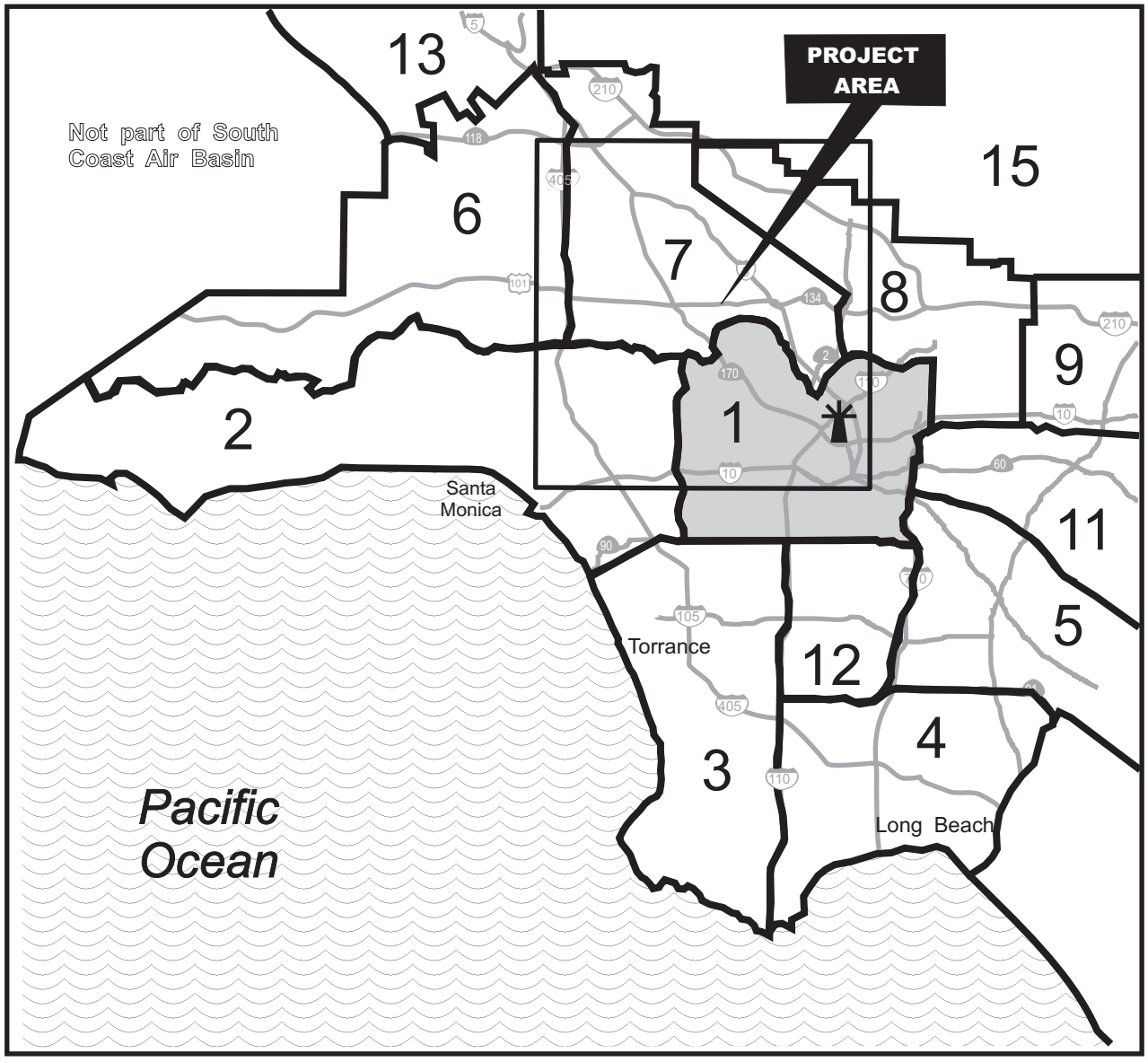
Table 4.1-3 shows pollutant levels, the State and federal standards, and the number of exceedances recorded at the Los Angeles-North Main Street Monitoring Station from 2009 to 2011. Criteria pollutants CO, NO_2, and SO_2 did not exceed the State and federal standards from 2009 to 2011. However, the one-hour State standard for O_3 was exceeded one to three times during this period. The eight-hour State standard for O_3 was exceeded zero to five times while the eight-hour federal standard for O_3 was exceeded zero to two times. The 24-hour State standard for PM_{10} was exceeded zero to four times during this period and the annual State standard for $PM_{2.5}$ was also exceeded each year from 2009 to 2011. The 24-hour federal standard for PM_{10} and the annual federal $PM_{2.5}$ was not exceeded between the year 2009 to 2011.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. CARB has identified the following groups who are most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers and retirement homes.

The study area for the First Year of the Five Year Implementation Strategy project consists of approximately 40 miles bicycle network in the communities of Hollywood, Westside, Central Los Angeles, and Northeast Los Angeles. The study area for the My Fig Project consists of approximately 3.5 miles along Figueroa Street. These urbanized areas include all of sensitive receptors discussed above.

[5]SCAQMD, Meteorological Data, available at http://www.aqmd.gov/smog/metdata/MeteorologicalData.html, accessed on September 6, 2012.
[6]Western Regional Climate Center, Historical Climate Information, available at http://www.wrcc.dri.edu, accessed on September 6, 2012.
[7]*Ibid*.



LEGEND: Los Angeles Monitoring Station

Air Monitoring Areas in Los Angeles County:

1. Central Los Angeles
2. Northwest Coastal
3. Southwest Coastal
4. South Coastal
5. Southeast Los Angeles County
6. West San Fernando Valley
7. East San Fernando Valley
8. West San Gabriel Valley
9. East San Gabriel Valley
10. Pomona/Walnut Valley (not shown)
11. South San Gabriel Valley
12. South Central Los Angeles
13. Santa Clarita Valley
14. Antelope Valley (not shown)
15. San Gabriel Mountains

Approx. Scale

N

0 4.5 9.0 Miles

SOURCE: South Coast Air Quality Management District Air Monitoring Areas Map, 1999.

FIGURE 4.1-2

AIR MONITORING AREA

TABLE 4.1-2:AMBIENT AIR QUALITY DATA

Pollutant	Pollutant Concentration & Standards	2009	2010	2011
Ozone (O_3)	Maximum 1-hr Concentration (ppm)	0.14	0.10	0.13
	Days > 0.09 ppm (State 1-hr standard)	3	1	1
	Maximum 8-hr Concentration (ppm)	0.10	0.08	0.07
	Days > 0.07 ppm (State 8-hr standard)	5	1	0
	Days > 0.075 ppm (National 8-hr standard)	2	1	0
Carbon Monoxide (CO)	Maximum 1-hr concentration (ppm)	3	3	n/a
	Days > 20 ppm (State1-hr standard)	0	0	n/a
	Days > 35 ppm (National 1-hr standard)	0	0	n/a
	Maximum 8-hr concentration (ppm)	2.2	2.3	2.4
	Days > 9.0 ppm (State 8-hr standard)	0	0	0
	Days > 9 ppm (National 8-hr standard)	0	0	0
Nitrogen Dioxide (NO_2)	Maximum 1-hr Concentration (ppm)	0.16	0.09	0.11
	Days > 0.18 ppm (State 1-hr standard)	0	0	0
	Days > 0.100 ppm (National 1-hr standard)	n/a	n/a	n/a
Respirable Particulate Matter (PM_{10})	Maximum 24-hr concentration ($\mu g/m^3$)	70	41	53
	Days > 50 $\mu g/m^3$ (State 24-hr standard)	4	0	1
	Days > 150 $\mu g/m^3$ (National 24-hr standard)	0	0	0
Fine Particulate Matter ($PM_{2.5)}$	Maximum 24-hr concentration ($\mu g/m^3$)	64	39	49
	Exceed State Standard (12 $\mu g/m^3$)	Yes	Yes	Yes
	Days > 35 $\mu g/m^3$ (National 24-hr standard)	7	5	8
Sulfur Dioxide (SO_2)	Maximum 24-hr Concentration (ppm)	0.002	0.002	0.002
	Days > 0.04 ppm (State 24-hr standard)	0	0	0
	Days > 0.14 ppm (National 24-hr standard)	0	0	0

n/a = not available
SOURCE: CARB, Air Quality Data Statistics, *Top 4 Summary*, http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed on April 30, 2012.
CO pollutant concentration was obtained from SCAQMD, Historical Data by Year, available at http://www.aqmd.gov/smog/historicaldata.htm, accessed on September 6, 2012.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the proposed projects would have a significant impact related to land use impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Create objectionable odors affecting a substantial number of people.

The SCAQMD has developed specific CEQA significance thresholds to assess construction and operational air quality impacts.

Construction Phase Significance Criteria

The proposed projects would have a significant impact related to construction activity if:

- Daily regional and localized construction emissions were to exceed SCAQMD construction emissions thresholds for VOC, NO_X, CO, SO_X, $PM_{2.5}$, or PM_{10}, as presented in **Table 4.1-3**;
- The proposed projects would generate significant emissions of TACs; and/or
- The proposed projects would create an odor nuisance.

TABLE 4.1-3: SCAQMD DAILY CONSTRUCTION EMISSIONS THRESHOLDS		
Criteria Pollutant	**Regional Emissions (Pounds Per Day)**	**Localized Emissions (Pounds Per Day) /a/**
Volatile Organic Compounds (VOC)	75	--
Nitrogen Oxides (NO_X)	100	74
Carbon Monoxide (CO)	550	680
Sulfur Oxides (SO_X)	150	--
Fine Particulates ($PM_{2.5}$)	55	3
Particulates (PM_{10})	150	5
/a/The analysis assumed a one-acre construction area with a 25-meter (82-foot) receptor distance.		
SOURCE: SCAQMD, 2012.		

Operational Phase Significance Criteria

The proposed projects would have a significant impact related to operational activity if:

- Daily operational emissions were to exceed SCAQMD operational emissions thresholds for VOC, NO_X, CO, SO_X, $PM_{2.5}$, or PM_{10}, as presented in **Table 4.1-4**;
- Project-related traffic causes CO concentrations at study intersections to violate the CAAQS for either the one- or eight-hour period. The CAAQS for the one- and eight-hour periods are 20 and 9.0 ppm, respectively;
- The proposed projects would generate significant emissions of TACs;
- The proposed projects would create an odor nuisance; and/or
- The proposed projects would not be consistent with the AQMP.

TABLE 4.1-4: SCAQMD DAILY OPERATIONAL EMISSIONS THRESHOLDS	
Criteria Pollutant	**Pounds Per Day**
Volatile Organic Compounds (VOC)	55
Nitrogen Oxides (NO_X)	55
Carbon Monoxide (CO)	550
Sulfur Oxides (SO_X)	150
Fine Particulates ($PM_{2.5}$)	55
Particulates (PM_{10})	150
SOURCE: SCAQMD, 2012.	

IMPACTS

Construction

Proposed installation of the bicycle lanes is anticipated to begin in early 2013 and would take less than 12 months to complete. Minor construction including excavation and construction of streetscape improvements anticipated in connection with the My Fig Project is expected to also be completed within approximately 20 months. While the total construction time would extend for this duration, the project is comprised of approximately 39.5 miles and construction in front of any one business or residence would only require a few days to a few weeks for the My Fig Project.

Regional. Construction activity would mainly include reconfiguration of roadway striping and would not include excavation or construction. Construction of the proposed projects has the potential to generate air quality emissions through vehicle trips generated by construction workers and the application of road paint. My Fig Project would include minor excavation and construction of streetscape improvements. The operation of heavy-duty construction equipment is not anticipated during construction activity. However, this worst-case analysis assumed one paving equipment and four on-site construction workers. Potential impacts associated with air emissions were evaluated based on a spreadsheet methodology. The spreadsheet included equipment type and hours and worker commute trips. Equipment engine emissions were estimated using OFFROAD2007 and commute trips emissions were estimated using EMFAC2011. Regional emissions were compared to SCAQMD regional thresholds to determine project impact significance.

Table 4.1-5 shows the maximum estimated daily regional emissions associated with construction activity. Daily construction emissions would not exceed the SCAQMD regional significance threshold for all criteria pollutants. Therefore, the proposed projects would result in a less-than-significant impact related to regional construction emissions.

TABLE 4.1-5: DAILY CONSTRUCTION EMISSIONS – YEAR 2013

	Pounds Per Day					
Construction Activity	**VOC**	**NO_X**	**CO**	**SO_X**	**$PM_{2.5}$**	**PM_{10}**
On-Site	1	6	3	0	<1	<1
Off-Site	<1	<1	1	0	<1	<1
Maximum Regional Total	1	6	4	0	<1	<1
Regional Significance Threshold	**75**	**100**	**550**	**150**	**55**	**150**
Exceed Threshold?	No	No	No	No	No	No
Maximum On-Site Total	1	6	3	0	<1	<1
Localized Significance Threshold /a/	**--/b/**	**74**	**680**	**-- /b/**	**3**	**5**
Exceed Threshold?	--	No	No	--	Yes	Yes

/a/ The analysis assumed aone-acre project site and a 25-meter (82-foot) receptor distance.
/b/ SCAQMD has not developed localized significance methodology for VOC or SO_X.
SOURCE: TAHA, 2010.

Localized. Localized impacts from on-site daily emissions associated with construction activities were evaluated for sensitive receptors located adjacent to construction activity. Emissions for the localized construction air quality analysis of $PM_{2.5}$, PM_{10}, CO, and NO_2 were compiled using Localized Significance Threshold (LST) methodology promulgated by the SCAQMD in *Sample Construction Scenarios for Project Less than Five Acres in Size*. Localized on-site emissions were calculated using similar methodology to the regional emission calculations. LSTs were developed based upon the size or total area of the emissions source, the ambient air quality in each source receptor area, and the distance to the sensitive receptor. The proposed projects would include implementation of approximately 43 miles of re-striping activity, but it is anticipated that reconfiguration of roadway striping would be carried out in smaller project segments. Hence, localized emissions were compared to localized thresholds for a one-acre project site to determine project impact significance.

As shown in **Table 4.1-6**, daily construction emissions would not exceed the SCAQMD localized significance thresholds. Therefore, the proposed projects would result in a less-than-significant impact related to localized construction emissions.

Toxic Air Contaminant (TACs). The greatest potential for TAC emissions during construction would be diesel particulate emissions associated with heavy-duty equipment operations. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of individual cancer

risk. "Individual Cancer Risk" is the likelihood that a person continuously exposed to concentrations of TACs over a 70-year lifetime will contract cancer based on the use of standard risk assessment methodology. Construction activity would occur throughout the project area and sensitive receptor exposure to construction TACs would vary during the process. Exposure to diesel particulate matter and related TACs are anticipated to be low. Therefore, the proposed projects would result in a less-than-significant impact related to construction TAC emissions.

Odor. Potential sources that may emit odors during construction activities include equipment exhaust and paving and painting activities. Odors from these sources would be localized and generally confined to the immediate area surrounding the construction site. The proposed projects would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. The proposed projects' construction would not cause an odor nuisance. Therefore, the proposed projects would result in a less-than-significant impact related to construction odors.

Operational

Regional. The proposed projects are intended to promote bicycle as a viable alternative to private automobile. Bicycle travel is an environmentally sustainable means of transportation - there are no tailpipe emissions, no evaporative emissions, no emissions from gasoline pumping or oil refining, and zero CO_2 or other pollutants that contribute to poor air quality. Implementation of the proposed bike lanes would reduce regional air pollutant emissions associated with mobile sources via reduction in automobile vehicle miles traveled. Since pollutant emissions are directly proportional to the number of trips/vehicle miles travel (VMT), the proposed projects would lower mobile emissions. Therefore, the proposed projects would not result in a significant impact related to regional mobile emissions.

The Los Angeles County Bicycle Plan indicates that the total number of bicycle commuterscould increase from the current estimate of 2,612 to 12,021 by the year 2030 in the Metro Planning Area. The Metro Planning Area is located in a dense urban area of central County of Los Angeles. This planning area contains a large portion of the incorporated City of Los Angeles, including Downtown Los Angeles and South Los Angeles. The planning area's unincorporated communities include East Los Angeles, Florence-Firestone, Walnut Part, West Athens-Westmont, West Rancho Dominguez-Victoria, and Willowbrook. Such an increase in bicycle commuters would result in an estimated decrease of 95 pounds of VOC per weekday, 66 pounds of NO_X per weekday, 866 pounds of CO per weekday, and less than one pound of PM_{10} and $PM_{2.5}$ per weekday. Therefore, increasing bicycle ridership would result in a beneficial outcome for air quality emissions.

Localized. Reconfiguration of roadway striping would potentially remove one or more vehicular travel lanes. Alternatively, existing parking lanes could be removed instead of vehicular travel lanes to incorporate the proposed bicycle lanes. Reducing the number of travel lanes would result in local traffic congestion, resulting in a signalized intersection worsening Level of Service (LOS) E or F. Localized high concentrations of CO concentration could occur where large amounts of traffic operate under heavily congested conditions and if vehicles would be idling for a substantial period of time. Many roadway segments affected by the proposed projects already operate at or near capacity during peak hour periods and any incremental change in traffic volumes or vehicle idling emissions would not be significant. In addition, despite the fact the components of the proposed projects in traffic may decrease vehicle speeds and increase idle times at certain intersections, CO concentrations in the Basin have not exceeded State standards since 1992 due to stringent State and federal mandates for lowering vehicle emissions. This is accurate even when considering the most congested City intersections with the highest traffic volumes and largest percentage of vehicle idle time. It is not anticipated that any intersection affected by the proposed projects contains the requisite vehicle volumes and delays to generate a CO hotspot. Therefore, the proposed projects would result in a less-than-significant impact related to localized CO concentrations.

Toxic Air Contaminants (TACs). The SCAQMD recommends that health risk assessments be conducted for substantial sources of diesel particulate emissions (e.g., truck stops and warehouse distribution facilities) and has provided guidance for analyzing mobile source diesel emissions.[8] The proposed projectswould not generate daily truck trips. Based on the limited activity of TAC sources, the proposed projects would not warrant the need for a health risk assessment associated with on-site activities. Therefore, the proposed projects would result in no significant impact related to TAC.

Typical sources of acutely and chronically hazardous TACs include industrial manufacturing processes and automotive repair facilities. The proposed projects would not include any of these potential sources. It is expected that the proposed projects would not release substantial amounts of TACs. Therefore, the proposed projects would result in no significant impact related to TAC.

Odor. According to the SCAQMD *CEQA Air Quality Handbook*, land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies and fiberglass molding. The proposed projects are not the type of land uses that are typically associated with odor complaints. Therefore, the proposed projects would result in no significant impact.

Air Quality Management Plan Consistency. The 2012 AQMP was prepared to accommodate growth, to reduce the high levels of pollutants within areas under the jurisdiction of SCAQMD, to return clean air to the region, and to minimize the impact on the economy.Consistency with the AQMP can be assessed by determining how a project accommodates increased in population or employment. Generally, a project that is planned in a way that minimizes vehicle miles traveled (VMT) both within the project area and the surrounding community would also minimize air pollutant emissions. Therefore, the proposed projects would be consistent with the goals of the AQMP.

City of Los Angeles General Plan Consistency. The proposed projects would be consistent to the Transportation Element in the City's General Plan. The proposed projects would be consistent with Objective 2, which would mitigate the impacts of traffic growth, reduce congestion, and improve air quality by implementing a comprehensive program of multimodal strategies that encompass physical and operational improvements as well as demand management. As mentioned, the proposed projects would improve air quality by switching automobile travelers to bicycle use, which would not produce criteria pollutants. The proposed projects would continue with the City's efforts to reduce air quality emissions. Therefore, the proposed projects would be consistent with the objectives of the City's General Plan.

MITIGATION MEASURES

Construction

Construction impacts related to air quality emissions and applicable plans, policies, and regulations would be less than significant. No mitigation measures are required.

Operations

Operational impacts related to air quality emissions and applicable plans, policies, and regulations would be less than significant. No mitigation measures are required.

[8]SCAQMD, Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions, December 2002.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Construction

Construction impacts related to air quality emissions and applicable plans, policies, and regulations were determined to be less than significant without mitigation.

Operations

Operational impacts related to air quality emissions and applicable plans, policies, and regulations were determined to be less than significant without mitigation.

CUMULATIVE IMPACTS

A significant impact would occur if the proposed projects resulted in a cumulative net increase in any criteria pollutant above threshold standards. The SCAQMD's approach for assessing cumulative air quality impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Acts. The SCAQMD has set forth significance thresholds designed to assist in the attainment of ambient air quality standards. The proposed projects would not result in significant emissions. Therefore, the proposed projects would not result in a cumulatively considerable impact related to construction air quality.