IV. ENVIRONMENTAL IMPACT ANALYSIS
D. AIR QUALITY

ENVIRONMENTAL SETTING

This section examines the degree to which the proposed Circulation Element Update may result in significant adverse changes to air quality. This section considers both short-term construction emissions resulting from implementation of the roadway and intersection improvements identified in the proposed Circulation Element Update and long-term effects related to the performance of the proposed Circulation Element Update roadway network under future traffic conditions. The analysis contained herein focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the actual quantity of pollutant measured in pounds per day (ppd). "Concentrations" refer to the amount of pollutant material per volumetric unit of air. "Concentrations" are measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

Regulatory Setting

Air quality in the United States is governed by the Federal Clean Air Act (CAA). In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). At the Federal level, the 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 at the regional and local levels.

United States Environmental Protection Agency (USEPA)

The USEPA is responsible for enforcing the Federal CAA. The USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 CAA and subsequent amendments. The USEPA regulates emission sources that are under the exclusive authority of the Federal government, such as aircraft, ships, and certain types of locomotives. The agency 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 the stricter emission standards established by the CARB.

California Air Resources Board (CARB)

In California, the CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for meeting the state requirements of the Federal 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. The CAAQS are generally more stringent than the corresponding Federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The CARB regulates mobile air pollution sources, such as motor vehicles. The agency 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. The CARB established passenger vehicle fuel specifications, which became effective in March 1996. The 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 level.

South Coast Air Quality Management District (SCAQMD)

The South Coast Air Quality Management District (SCAQMD) monitors air quality within the project area. 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 the 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 South Coast Air Basin (SCAB). 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 source, area source, point source and certain mobile source emissions. The SCAQMD is also responsible for establishing permitting requirements for stationary sources and ensuring that new, modified or relocated stationary sources do not create net emission increases and therefore, are consistent with the region's air quality goals.

SCAQMD has jurisdiction over an approximately 10,743 square mile area of the SCAB. This area includes all of Orange County, Los Angeles County (except for the Antelope Valley), the western urbanized portions of San Bernardino County, and the western and Coachella Valley portions of Riverside County. The SCAB 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 IV.D-1). Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the SCAB.

Attainment Status

The CCAA requires CARB to designate areas within California as either attainment or non-attainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as non-attainment for a pollutant if air quality data shows that a State standard for a

Figure IV.D-1, SCAB Boundary Map

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 not used as a basis for designating areas as non-attainment.

Under the CCAA, the Los Angeles County portion of the SCAB is designated as a non-attainment area for ozone, carbon monoxide, and respirable particulate matter. The air basin is designated as an attainment area for nitrogen dioxide, sulfur dioxide, sulfates, and lead.[1]

Air Quality Management Plan (AQMP)

All areas designated as non-attainment under the CCAA are required to prepare plans showing how the area would meet the state air quality standards by its attainment dates. The Air Quality Management Plan (AQMP) is the region's plan for improving air quality in the region. In response to Federal and State Clean Air Act requirements to bring air emissions within healthful levels, the SCAQMD has prepared a series of air quality management plans, the most recent of which was adopted by SCAQMD's Governing Board in August 2003. This AQMP is referred to as the 2003 AQMP. The 2003 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources including stationary sources, on-road and off-road mobile sources and area sources.

The 2003 AQMP is an update to the 1997 AQMP, which was amended in 1999. The 1997 AQMP was designed to accommodate growth, to reduce the high levels of pollutants within the areas under the jurisdiction of the SCAQMD, to return clean air to the region by 2010, and to minimize the impact on the economy. The 2003 AQMP is generally similar to the structure of the 1997 AQMP. The key improvements incorporated into the AMQP are summarized as follows:

1. Revised emissions inventory projections using 1997 as the base year, the CARB on-road motor vehicle emissions model EMFAC2002, and SCAG 2001 Regional Transportation Plan (RTP) forecast assumptions;

2. Revised control strategy that updates remaining control measures from the 1997/1999 State Implementation Plans (SIP) and incorporation of new control measures based on current technology assessments;

3. Reliance on 1997 ozone episodes and updated modeling tools for attainment demonstration relative to ozone and PM_{10}; and

[1] *California Air Resources Board: Proposed Area Designations and Maps, September 2000.*

4. An initial assessment of progress toward the new Federal 8-hour ozone and $PM_{2.5}$ standards.[2]

Environmental review of individual projects within the SCAB must demonstrate that daily construction and operational emissions thresholds, as established by the SCAB, 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. Projects that are considered to be consistent with AQMP growth projections should not interfere with attainment and should not contribute to the exceedance of an existing Federal or State air quality standard, because such growth is included in the projections utilized in the formulation of the AQMP.

National and State Ambient Air Quality Standards

As required by the Federal CAA, the NAAQS have been established for six major air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter, sulfur oxides, and lead. Pursuant to the CCAA, the State of California has also established ambient air quality standards, known as California Ambient Air Quality Standards (CAAQS). These standards are equivalent to or more stringent than the corresponding Federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particulates. Since the CAAQS are equivalent to or more stringent than the NAAQS, the CAAQS are used as the comparative standard in the air quality analysis contained in this report.

Both State and Federal standards are summarized in Table IV.D-1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

Pollutants and Effects

Air quality studies generally focus on the five pollutants that are most commonly measured and regulated: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and respirable particulate matter (PM_{10}).

Carbon Monoxide

Carbon monoxide (CO), a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, CO is

[2] *In 1997, US EPA promulgated a new Federal 8-hour standard for ozone and a 24-hour and an annual average standard for fine particulate matter ($PM_{2.5}$). The implementation guidelines for the new standards have not yet been finalized, and the SIP to demonstrate attainment with these new standards is expected to be due in 2007.*

emitted by motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. Automobile exhausts release most of the CO in urban areas. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient carbon monoxide concentrations generally follow 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[3] are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. The highest CO concentrations measured in the South Coast Air Basin (SCAB) are typically recorded during the winter.

Table IV.D-1
State and National Ambient Air Quality Standards

Pollutant	Averaging Period	California Standard	Federal Standards	
			Primary	Secondary
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	0.12 ppm (235 µg/m^3)	Same as Primary Standard
	8 Hour	---	0.08 ppm (157 µg/m^3)	
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	30 µg/m^3	---	Same as Primary Standard
	24 Hour	50 µg/m^3	150 µg/m^3	
	Annual Arithmetic Mean	---	50 µg/m^3	---
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	None
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	---	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1 Hour	0.25 ppm (470 µg/m^3)	---	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	---	0.03 ppm (80 µg/m^3)	---
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3))	---
	3 Hour	---	---	0.5 ppm (1300 µg/m^3))
	1 Hour	0.25 ppm (655 µg/m^3))	---	---

Source: California Air Resources Board, Federal and State Air Quality Standards 1999 (1/25/99).

[3] *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.*

Ozone

Ozone (O_3), a colorless toxic gas, is the chief component of urban smog. O_3 enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting their growth. Although O_3 is not directly emitted, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO_x) under sunlight.[4] O_3 is present in relatively high concentrations within the Basin, and the damaging effects of photochemical smog are generally related to the concentration of O_3. Meteorology and terrain play major roles in ozone 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.

Nitrogen Dioxide

Nitrogen dioxide, a brownish gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as nitrogen oxides (NO_x) and are major contributors to ozone formation. NO_2 also contributes to the formation of PM_{10} of PM_{10}. At atmospheric concentration, NO_2 is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 ppm.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a product of high-sulfur fuel combustion. Main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2. 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 cause plant leaves to turn yellow, as well as erode iron and steel. 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 concentrations have been reduced to levels well below the state and national standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM_{10}, of which SO_2 is a contributor.

Suspended 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 gases emitted from industries and motor vehicles that undergo chemical reactions in the atmosphere. PM_{10} and $PM_{2.5}$

[4] *ROG and NO_x are emitted from automobiles and industrial sources.*

represent fractions of particulate matter. Respirable particulate matter (PM_{10}) refers to particulate matter less than 10 microns in diameter, about one/seventh the thickness of a human hair. Fine particulate matter ($PM_{2.5}$) refers to particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair. Major sources of PM_{10} include motor vehicles; 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. $PM_{2.5}$ results from fuel combustion (from 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 sulfur dioxide, nitrogen oxides, and volatile organic compounds.

PM_{10} and $PM_{2.5}$ 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_{10} and $PM_{2.5}$ 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, particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues.[5] Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

Regional and Local Setting

Climate and Topography

The mountains and hills within the SCAB contribute to the variation of rainfall, temperature, and winds throughout the region. Winds in the City of El Segundo are primarily from the west, with an average wind speed, as recorded at the Lennox Wind Monitoring Station, of approximately 4.65 miles per hour[6].

The annual average temperature in El Segundo is approximately 65 degrees Fahrenheit. Temperatures range from the high 40s to high 60s during the winter and from the low 60s to high 80s during the summer. Total precipitation in El Segundo averages approximately 14.79 inches annually.

---

[5] *The NAAQS for $PM_{2.5}$ was adopted in 1997. Presently, no methodologies for determining impacts relating to $PM_{2.5}$ have been developed or adopted by federal, state, or regional agencies. Additionally, no strategies or mitigation programs for $PM_{2.5}$ have been developed or adopted by Federal, State, or regional agencies. Currently, this standard is not enforceable. However, the standard may be reinstated in the future. Thus, this air quality analysis does not analyze $PM_{2.5}$.*

[6] *Based on data from the Lennox wind monitoring station.*

Precipitation occurs mostly during the fall, winter and spring months and relatively infrequently during the summer.

Air Pollution Potential

El Segundo is located within the Los Angeles County portion of the SCAB. Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the basin. However, the western areas of Los Angeles County, particularly along the coast, generally experience better air quality than the remainder of the County.

The SCAB is 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 SCAB experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usual mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The SCAB 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 SCAB 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 nitrogen dioxide react under strong sunlight, creating pollution, commonly referred to as 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 carbon monoxide and nitrogen dioxide emissions. CO concentrations are generally worse in the morning and late evening (around 10:00 p.m.). Morning levels are relatively high due to the large number of cars during the commute and colder temperatures. The high levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the SCAB are associated with heavy traffic. Nitrogen dioxide (NO_2) levels are also generally higher during autumn or winter days. High levels of NO_2 in the fall and winter usually occur on days with summer-like conditions.

Air Monitoring Data

The SCAQMD monitors air quality conditions at 37 locations throughout the SCAB. The project site is located in the SCAQMD's Air Monitoring Area No. 3, which is served by the Southwest Coastal LA

County Monitoring Station, located near the intersection of 120th Street and La Cienega Boulevard, in the City of Hawthorne, just east of the eastern City boundary (Figure IV.D-2). Historical data from the Southwest Coastal LA County Monitoring Station was used to characterize existing conditions within the City and to establish a baseline for estimating future conditions.

Criteria pollutants monitored at the Southwest Coastal LA County Monitoring Station include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and respirable particulate matter (PM_{10}). Table IV.D-2 shows the number of violations recorded at the Southwest Coastal LA County Monitoring Station during the 2000 to 2002 period. The CAAQS for the criteria pollutants are also shown in Table IV.D-2. As Table IV.D-2 indicates, criteria pollutants CO, NO_2, and SO_2 did not exceed the CAAQS between the years 2000 and 2002. However, during the 2000 to 2002 period, O_3 exceeded the State Standard at least once in 2000 and 2001, and PM_{10} exceed the State standard 8 to 12 times.

Table IV.D-2
2000 to 2002 Criteria Pollutant Violations – Southwest Coastal LA County Monitoring Station

Pollutant	State Standard	Number of Days Above State Standard		
		2000	2001	2002
Ozone	0.09 ppm (1-hour)	1	1	0
Carbon Monoxide	9.0 ppm (8-hour avg.)	0	0	0
Nitrogen Dioxide	0.25 ppm (1-hour)	0	0	0
Sulfur Dioxide	0.04 ppm (24-hour avg.)	0	0	0
PM10	50 µg/m^3 (24-hour avg.)	9	8	12
Source: South Coast Air Quality Management District, see Appendix B.				

Carbon Monoxide

Background Carbon Monoxide Conditions

Carbon monoxide concentrations are typically used as an indicator of conformity with the CAAQS because: (1) CO levels are directly related to vehicular traffic volumes, the main source of air pollutants and (2) localized CO concentrations and characteristics can be modeled using USEPA and SCAQMD methods. In other words, the operational air quality impacts associated with a project are generally best reflected through the estimated changes in related CO concentrations.

For purposes of this assessment, the ambient, or background, concentration of CO is first established. This background level is typically defined as the highest of the second-maximum eight-hour readings over the past two years.[7] A review of data from the Southwest Coastal LA County Monitoring Station

[7] *Garza, Vicente J., Peter Graney, Daniel Sperling. Transportation Project-Level Carbon Monoxide Protocol. Institute of Transportation Studies, University of California, Davis. May 1996.*

.

Figure IV.D-2, Monitoring Stations

for the 2000 to 2002 period indicates that the average eight-hour background concentration is approximately 6.6 ppm.[8] Assuming a typical persistence factor of 0.7, the estimated one-hour background concentration is approximately 9.5 ppm,[9] The existing eight- and one-hour background concentrations do not exceed the State CO standard of 9.0 ppm and 20.0 ppm, respectively.

Existing Carbon Monoxide Concentrations at Project Area Intersections

There is a direct relationship between traffic/circulation congestion and CO impacts since exhaust fumes from vehicular traffic comprise the primary source of CO. Carbon monoxide is a localized gas that dissipates very quickly under normal meteorological conditions. Therefore, CO concentrations decrease substantially as distance from the source (intersection) increases. The highest CO concentrations are typically found along sidewalk locations directly adjacent to congested roadway intersections.

To provide a worst case simulation of CO concentrations within the area that might be affected by the proposed Circulation Element Update, CO concentrations at sidewalks adjacent to 7 study intersections were modeled. The study intersections were selected based on existing and projected traffic congestion, traffic volumes and capacity (V/C) ratio, and level of service (LOS). The greatest potential for CO impacts would occur at high volume, high congestion intersections. Therefore two of the study intersections (Imperial Highway/Sepulveda Boulevard and Aviation Boulevard/Rosecrans Avenue) were selected because they have the highest levels of traffic and congestion in the City. Five other study intersections were selected because they are located adjacent to residential areas (i.e., sensitive receptors). The selected study intersections were:

- Imperial Highway/Main Street,
- Imperial Highway/Sepulveda Boulevard
- Grand Avenue/Main Street,
- Aviation Boulevard/120th Street,
- Aviation Boulevard/Utah Street,
- Aviation Boulevard/Rosecrans Avenue
- El Segundo Boulevard/Isis Avenue

---

[8] *Source: SCAQMD*

[9] *Persistence factor is the ratio between the eight- and one-hour second annual maximum CO concentrations measured at a continuous air monitoring station. A persistence factor of 0.7 is typically used in urban areas.*

At each intersection, traffic related CO contributions, based upon existing traffic levels, were added to the background CO conditions determined from monitoring data from the Southwest Coastal LA County Monitoring Station. Traffic CO contributions were estimated using the CALINE 4 dispersion model. Existing conditions at the seven study intersections are shown in Table IV.D-3. One-hour CO concentrations range from approximately 10.1 ppm to 14.6 ppm. Eight-hour CO concentrations range from approximately 7.0 ppm to 10.1 ppm. Presently, none of the study intersections exceed the State one-hour CO standard of 20.0 ppm. The two most congested intersections in the City, Imperial/Sepulveda and Aviation/Rosecrans, presently exceed the State eight-hour CO standard of 9.0 ppm.

Table IV.D-3
Existing (2003) Carbon Monoxide (CO) Concentrations (parts per million)[a]

Intersection	1-hour	8-hour
Imperial Highway/Main Street	11.6	8.1
Imperial Highway/Sepulveda Boulevard	14.1	9.8
Grand Avenue/Main Street	10.1	7.0
Aviation Boulevard/120th Street	11.1	7.7
Aviation Boulevard/Utah Street	11.3	7.8
Aviation Boulevard/Rosecrans Avenue	14.6	10.1
El Segundo Boulevard/Isis Avenue	11.3	7.8
State Standard	20.0	9.0

/a/ All concentrations include one- and eight-hour ambient concentrations of 9.5 ppm and 6.6 ppm, respectively. CO concentrations shown represent conditions at 25 feet from roadway edge.
SOURCE: Christopher A Joseph & Associates.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the types of population groups and activities involved. CARB has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. These locations are called sensitive receptors.

Sensitive receptors located throughout and adjacent to the City of El Segundo include: the residential neighborhoods located in the northwestern quadrant of the City which also include park and school areas; residential communities of Del Aire and Hollyglen located east of the City, within unincorporated Los Angeles County and the City of Hawthorne, respectively, and also include park and school areas; and the residential communities in the City of Manhattan Beach located southwest of the City. No specific sensitive receptors are located within 25 feet of the roadway edge at the Imperial/Sepulveda and Aviation/Rosecrans intersections.

ENVIRONMENTAL IMPACTS

Threshold of Significance

The CEQA Guidelines (Section 15064.7) provide that, when applicable, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make determinations of significance. The following are the significance criteria that the SCAQMD has established to determine project impacts.

Construction

The proposed Circulation Element Update would have a significant impact if:

- Daily construction emissions were to exceed the SCAQMD construction emission thresholds for CO, ROG, NO_x, SO_x, or PM_{10}. The SCAQMD significance thresholds for construction activities are provided in Table IV.D-4.

Operation

The proposed Circulation Element Update would have a significant impact if:

- Daily operational emissions were to exceed the SCAQMD operational emissions thresholds for CO, ROG, NO_x, SO_x, or PM_{10}. The SCAQMD significance thresholds for operational emissions are provided in Table IV.D-4.

- Operation of the proposed Circulation Element Update roadway system results in CO concentrations at study intersections that violate the CAAQS for either the one- or eight-hour period. The CAAQS for the one- and eight-hour period are 20.0 ppm and 9.0 ppm, respectively. If CO concentrations currently exceed the CAAQS, then an incremental increase of 1.0 ppm over "no project" conditions for the one-hour period would be considered a significant impact. An incremental increase of 0.45 ppm over the "no project" conditions for the eight-hour period would be considered significant.[10]

[10] *Consistent with the SCAQMD Regulation XIII definition of a significant impact.*

Table IV.D-4
SCAMQD Daily Construction and Operational Emissions Thresholds

Criteria Pollutants	Pounds Per Day	
	Construction	Operations
Carbon Monoxide (CO)	550	550
Reactive Organic Gas (ROG)	75	55
Nitrogen Oxides (NO_x)	100	55
Sulfur Oxides (SO_x)	150	150
Particulates (PM_{10})	150	150
Source: South Coast Air Quality Management District.		

Project Impacts

Construction Phase Impacts

Construction emissions could result from the implementation of roadway improvements that are identified in the proposed Circulation Element Update, including the construction of new roadways through the Sepulveda/Rosecrans site, and from the implementation of identified intersection improvements at 14 intersections. Minimal or no construction emissions would be expected to result from the conversion of Nash and Douglas Streets from one-way to two-way, as this activity would occur within the existing right-of-way and would involve only restriping of the existing roadway and possible installation of new street lighting or traffic signal poles (i.e., no major grading or construction activity required), or from the deletion of roadways from the Circulation Element network, as no construction activity would be associated with this component of the proposed Circulation Element Update. Impacts from construction emissions associated with these components of the proposed Circulation Element Update would not exceed SCAQMD thresholds and would be less than significant.

Because this is a Program EIR, and the particular characteristics of specific roadway and intersection improvements projects are not and cannot be known at this time, a prototypical construction scenario has been developed to represent a "typical" construction project that could be associated with implementation of the proposed Circulation Element Update. This prototypical project consists of the expansion of an intersection with two additional travel lanes in each direction, on each leg of the intersection for a distance of 200 feet from the intersection[11]. This project would involve a construction

[11] *Although the calculations are based on an typical intersection improvement, construction activities associated with the proposed Circulation Element Update could include construction of roadway improvements, which would generate construction emissions that would also be generally consistent with the prototypical construction scenario.*

area conservatively assumed to exist of approximately 1.5 acres[12], with approximately 4,750 cubic yards of soil export and a similar amount of concrete poured[13].

Construction activities associated with this prototypical scenario that would generate pollutant emissions would include: (1) grading/excavation, (2) preparation of the new roadway base; (3) construction workers travel to and from the construction site, (4) delivery and hauling of construction supplies to the construction site and haul trips to remove excavated soil from the construction site, and (5) fuel combustion by on-site construction equipment. These construction activities would temporarily create emissions of dusts, fumes, equipment exhaust, and other air contaminants. However, PM_{10} is the most significant source of air pollution from construction, particularly during site preparation and grading.

Table IV.D-5 shows the estimated daily emissions associated with the prototypical construction of an intersection improvement. Daily emissions were derived using the applicable emission factors and formulas found in the SCAQMD CEQA Handbook, appendix to Chapter 9 and were prepared using the URBEMIS 2002 model. Emissions at the levels estimated for the prototypical construction scenario could occur at any location where construction would be associated with implementation of the proposed Circulation Element Update, including the Rosecrans/Sepulveda site, at the 14 intersections where improvements have been identified, and any roadway widening or extension.

Table IV.D-5
Estimated Daily Construction Emissions for a Single Prototypical Intersection Improvement (pounds per day)

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10} /a/
Grading/Excavation	84.78	11.82	97.99	0.07	4.59
Concrete Pour & Roadway Construction	45.31	6.68	52.26	0.02	2.47
Maximum	84.78	11.82	97.99	0.07	4.59
SCAQMD Threshold	550	75	100	150	150
Exceed Threshold?	No	No	No	No	No

/a/ Assumes proper implementation of SCAQMD Rule 403.
SOURCE: Christopher A Joseph & Associates

[12] *Calculated as follows: 4 legs of the intersection, expanded by 40 feet (two travel lanes and shoulder) on each side, or 80 feet total, for a distance of 200 feet (4 x 80 x 200 = 64,000 square feet, or approximately 1.47 acres).*

[13] *Calculated as follows: 64,000 square feet of construction area, excavated to a depth of 2 feet to the roadway base (128,000 cubic feet, or 4,741 cubic yards of soil removal) and construction of new concrete roadway to the existing grade.*

However, it is not likely that only one intersection improvement would be implemented at a time. Based on the City's past experience with roadway improvement financing, requirements related to construction contracting and phasing, and the City's capacity to design and implement roadway and intersection improvements, a more typical construction scenario would encompass the construction of up to three intersection improvements at any given time. Emissions associated with this construction scenario are shown in Table IV.D-6. As shown, estimated daily construction emissions would exceed the SCAQMD threshold for NOx and thus NOx emissions would be significant. Emissions of other pollutants would be below the SCAQMD thresholds and less than significant impacts would occur. Daily PM_{10} emissions identified in Table IV.D-5 and IV.D-6 assume proper implementation of SCAQMD Rule 403.[14] Implementation of mitigation measures 1 to 12, recommended by SCAQMD, would ensure proper implementation of Rule 403 such that a less than significant impact is anticipated.

Table IV.D-6
Estimated Daily Construction Emissions for the Prototypical Construction Scenario (pounds per day)

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10} /a/
Grading/Excavation	254.34	35.46	293.97	0.21	13.77
Concrete Pour & Roadway Construction	135.93	20.04	156.78	0.06	7.41
Maximum	254.34	35.46	293.97	0.21	13.77
SCAQMD Threshold	550	75	100	150	150
Exceed Threshold?	No	No	Yes	No	No

/a/ Assumes proper implementation of SCAQMD Rule 403.
SOURCE: Christopher A Joseph & Associates

Fugitive Dust Abatement

Construction activity associated with implementation of the proposed Circulation Element Update would be subject to the provisions of SCAQMD Rule 403-Fugitive Dust. Rule 403 applies to any activity or man-made condition capable of generating fugitive dust. Rule 403 requires the use of best available control measures to suppress fugitive dust emissions. The requirements of Rule 403 that are applicable to construction activities associated with the proposed Circulation Element Update are as follows:

(1) A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source.

---

[14] *Implementation of Rule 403 is estimated to reduce dust and PM_{10} emissions by approximately 30 percent during the demolition phase and by approximately 75 percent during the grading phase. The larger reduction in PM_{10} emissions during the grading phase is due to the heightened level of activity that would occur during this phase, which includes the use of construction vehicles, earthmoving activities, and haul truck trips. The resulting daily PM_{10} emissions, shown in Table IV.D-6, would not exceed the SCAQMD significance threshold of 150 ppd.*

(2) A person conducting active operations within the boundaries of the South Coast Air Basin shall utilize one or more of the applicable best available control measures to minimize fugitive dust emissions from each fugitive dust source type which is part of the active operation.

(3) Any person in the South Coast Air Basin shall:

(A) prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations; or

(B) take at least one of the actions listed in Table IV.D-7 and:

(i) prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations; and

(ii) remove all visible roadway dust tracked-out upon public paved roadways as a result of active operations at the conclusion of each work day when active operations cease.[15]

Table IV.D-7
SCAQMD Rule 403 – Track-Out Control Options

(1)	Pave or apply chemical stabilization and sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that existing vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the Executive Officer and the USEPA as equivalent to the methods specified may be used.

SOURCE: South Coast Air Quality Management District, Rule 403 - Fugitive Dust, Table 3. See Appendix H.

Operational Impacts

Regional Impacts

Regional operational emissions are generated by motor vehicles. The proposed Circulation Element Update would not result in any increase in traffic utilizing the City's Circulation Element roadway network. All future traffic evaluated in this EIR is already reflected in the SCAG regional model or City of El Segundo General Plan, as the proposed Circulation Element Update would not change any of the existing land use designations in the General Plan. Therefore, no additional regional emissions

[15] *See Air Quality Appendix for the complete text of SCAQMD Rule 403.*

would occur as a result of the proposed Circulation Element Update and no impacts related to regional air emissions would occur.

Localized Impacts

Overall, background CO concentrations in year 2025 will be lower than existing conditions due to stringent state and federal mandates for lowering vehicle emissions. Although traffic volumes would be higher, based upon continued development in the City in accordance with the existing General Plan and regional traffic growth in accordance with SCAG forecasts, CO emissions from individual vehicles are expected to be lower due to technological advances in vehicle emissions systems, as well as turnover in the vehicle fleet. In other words, increases in traffic volumes are expected to be offset by increases in cleaner-running cars as a percentage of the entire vehicle fleet on the road.

The CALINE 4 micro-scale dispersion model was used to calculate CO concentrations at the seven study intersections for the operation of the proposed Circulation Element Update roadway system in 2025. CO concentrations at the seven study intersections are shown in Table IV.D-8. As indicated, one-hour CO concentrations would range from approximately 6.4 ppm to 10.3 ppm at worst-case sidewalk receptors. Eight-hour CO concentrations are anticipated to range from approximately 4.4 ppm to 7.1 ppm. The State one- and eight-hour standards of 20.0 ppm and 9.0 ppm, respectively, would not be exceeded at worst-case sidewalk receptor locations at any of the study intersections. Thus, a less than significant impact is anticipated at the study intersections. In addition, because the intersections with the highest levels of traffic and congestion (Imperial/Sepulveda and Aviation/Rosecrans) would not exceed the State standard, other intersections in the City would also not exceed the standard. Impacts related to CO concentrations would be less than significant.

Table IV.D-8
Future (2025) Carbon Monoxide (CO) Concentrations (parts per million)[a]

Intersection	1-hour	8-hour
Imperial Highway/Main Street	7.5	5.2
Imperial Highway/Sepulveda Boulevard	10.3	7.1
Grand Avenue/Main Street	6.4	4.4
Aviation Boulevard/120th Street	7.9	5.5
Aviation Boulevard/Utah Street	8.4	5.8
Aviation Boulevard/Rosecrans Avenue	9.9	6.9
El Segundo Boulevard/Isis Avenue	8.5	5.9
State Standard	20.0	9.0

/a/ All concentrations include one- and eight-hour ambient concentrations of 6.1 ppm and 4.2 ppm, respectively. CO concentrations shown represent conditions at 25 feet from roadway edge.
SOURCE: Christopher A Joseph & Associates.

2003 AQMP Consistency

A project is consistent with the AQMP if it is consistent with the population, employment and household assumptions, which were used in the development of the AQMP. Consistency with growth projections is especially important for projects involving general plan amendments, such as the proposed Circulation Element Update. SCAG traffic analysis is based on General Plan information, and the 2003 AQMP air quality impacts are based on SCAG traffic data. The proposed Circulation Element Update is consistent with the SCAG traffic model and does not incorporate any changes to the land uses set forth in the El Segundo General Plan or zoning. Thus the proposed Circulation Element Update would be consistent with the growth projections utilized in the AQMP.

Regarding the 2003 AQMP, a project is consistent with the plan if the project demonstrates that it would not contribute to future violations of Federal and State ambient air quality standards and is consistent with growth projections.[16] The analysis of CO concentrations presented above indicates that the proposed Circulation Element Update would accommodate future traffic levels without resulting in violations of state standards for CO. Therefore the proposed Circulation Element Update would be consistent with the 2003 AQMP.

CUMULATIVE IMPACTS

Air emissions from construction activity associated with the prototypical construction scenario that would occur under the proposed Circulation Element Update would be exceed SCAQMD thresholds for NOx and would be significant. Potential cumulative impacts with other construction activity occurring in the same area, and at the same time, as the roadway and intersection improvement projects could occur to the extent that emissions associated with these activities were to overlap. To the extent that this occurs, cumulative construction air quality impacts would be significant, based on potential exceedance of the SCAQMD thresholds for construction emissions. However, as discussed above, the proposed Circulation Element Update would be consistent with the AQMP, which is the region's mechanism for achieving State and Federal air quality standards. As such, the proposed Circulation Element would not hinder the ability of the region to attain state and federal air quality standards through the AQMP. Therefore cumulative air quality impacts of the proposed Circulation Element Update, in conjunction with other regional growth, would be less than significant, based on SCAQMD methodology for determining AQMP consistency.

The analysis of local CO concentration impacts associated with implementation of the proposed Circulation Element Update considers the effects of both background growth in the region, as reflected in the SCAG regional model, and within the City, in accordance with the existing land use designations of the City's General Plan. Consequently, impacts of cumulative growth are already incorporated into the 2025 traffic projections utilized to model the future CO concentrations shown in Table IV.D-8

[16] *Personal communication with James Koizumi, SCAQMD CEQA Section, November 21, 2003.*

above. As indicated, impacts of cumulative traffic growth within the City to 2025 with respect to CO concentrations would be less than significant.

SUBSEQUENT ENVIRONMENTAL DOCUMENTATION

Subsequent environmental documentation shall be prepared for any roadway or intersection improvement project identified in the proposed Circulation Element Update to identify emissions associated with construction of that specific roadway or intersection improvement. The subsequent environmental documentation shall address the following:

- Prior to implementation of specific roadway or intersection improvements, impacts associated with construction emissions shall be examined in light of this Program EIR to determine whether a new Initial Study would be required to be prepared leading to either an EIR or Negative Declaration. This examination shall provide quantified estimates of construction emissions based upon the specific site, schedule and construction equipment utilization characteristics of the proposed roadway or intersection improvement and compare the estimated emissions to the SCAQMD thresholds for construction emissions. The analysis shall incorporate the mitigation measures identified below as appropriate, along with any other mitigation measures identified by the project-specific analysis.

MITIGATION MEASURES

Construction

The following is a list of feasible control measures that the SCAQMD recommends for construction emissions of PM_{10}. These mitigation measures shall apply to all construction activities associated with implementation of the proposed Circulation Element Update, including construction of new roadways on the Sepulveda/Rosecrans site and construction of identified intersection improvements at 14 intersections. Because of the limited construction activity that would be associated with the conversion of Nash and Douglas Streets from one-way to two-way operation, no mitigation measures are required for this component of the proposed Circulation Element Update.

Fugitive Dust, PM_{10}

Compliance with SCAQMD Rule 403, including but not limited to the following:

D-1 The construction area and vicinity (500-foot radius) shall be swept (preferably with water sweepers) and watered at least twice daily. Site wetting shall occur often enough to maintain a 10 percent surface soil moisture content throughout all earth-moving activities.

D-2 All unpaved roads, parking and staging areas shall be watered at least once every two hours of active operations.

D-3 Site access points shall be swept/washed within thirty minutes of visible dirt deposition.

D-4 On-site stockpiles of debris, dirt or rusty material shall be covered or watered at least twice daily.

D-5 All haul trucks hauling soil, sand and other loose materials shall either be covered or maintain two feet of freeboard.

D-6 All haul trucks shall have a capacity of no less than twelve and three-quarter (12.75) cubic yards.

D-7 At least 80 percent of all inactive disturbed surface areas shall be watered on a daily basis when there is evidence of wind-driven fugitive dust.

D-8 Operations on any unpaved surfaces shall be suspended when winds exceed 25 mph.

D-9 Traffic speeds on unpaved roads shall be limited to 15 miles per hour.

D-10 Operations on any unpaved surfaces shall be suspended during first and second stage smog alerts.

D-11 Haul trucks shall be staged in non-residential areas.

D-12 Haul truck routes shall be planned to avoid residential areas, schools, and parks.

NOx Emissions

D-13 Equipment shall be turned off when not in use for more than 5 minutes.

Operation

Impacts of the proposed Circulation Element Update with respect to regional emissions and localized CO concentrations would be less than significant. No mitigation measures are required.

LEVEL OF IMPACT AFTER MITIGATION

Construction

Construction impacts associated with the conversion of Nash and Douglas Streets from one-way to two-way operation would be less than significant.

Impacts of the proposed Circulation Element Update with respect to construction emissions would be significant and unavoidable for NOx emissions and less than significant for all other emissions.

Operation

Impacts of the proposed Circulation Element Update with respect to operational emissions would be less than significant.