2.13 Air Quality

2.13.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion State law. These laws, and related regulations by the United States Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and State ambient air quality standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO); nitrogen dioxide (NO_2); ozone (O_3); particulate matter, which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$); lead, and sulfur dioxide (SO_2). In addition, State standards exist for visibility-reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and State standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both State and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

2.13.1.1 Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the United States Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The Build Alternative must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. USEPA regulations at 40 Code of Federal Regulations (CFR) 93

govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for State standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), SO_2. California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead; however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and Transportation Improvement Program (TIP); the project has a design concept and scope[1] that have not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and USEPA-approved emissions models; and in particulate matter areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot

[1] "Design concept" refers to the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

analyses) may be required for projects located in CO and particulate matter nonattainment or maintenance areas to examine localized air quality impacts.

2.13.2 Affected Environment

This section is based on the *Air Quality Report* (April 2023) prepared for the proposed Project.

2.13.2.1 Climate, Meteorology, and Topography

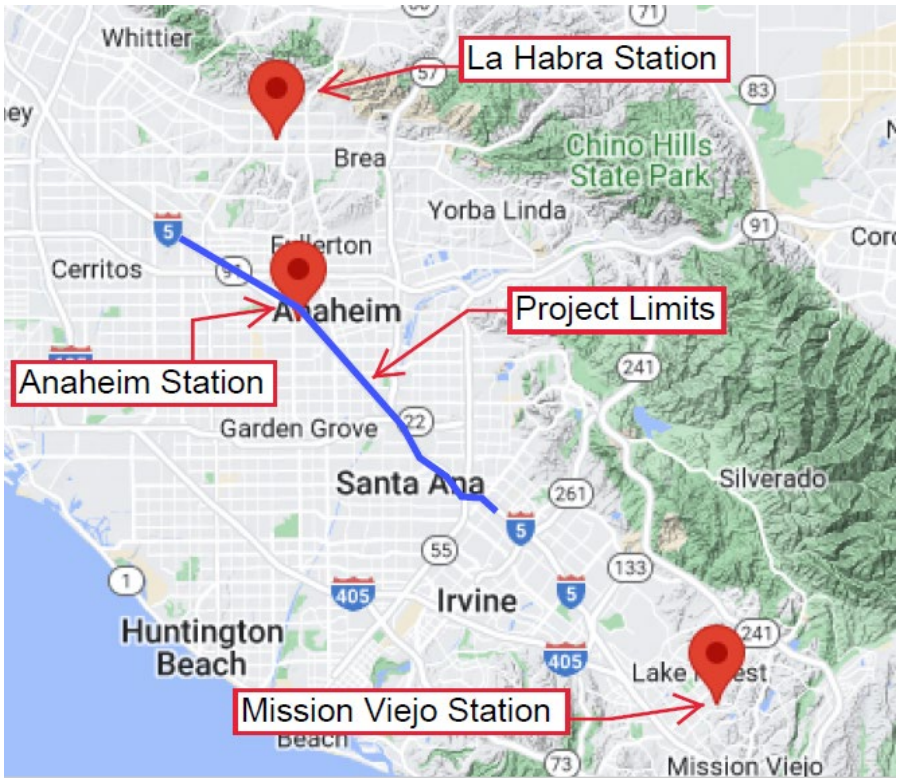
The Project Area is located within the South Coast Air Basin (Basin), which includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the Basin.

Meteorology (weather) and terrain can influence air quality. Certain weather parameters are highly correlated to air quality, including temperature, the amount of sunlight, and the type of winds at the surface and above the surface. Winds can transport O_3 and O_3 precursors from one region to another, contributing to air quality problems downwind of source regions. Furthermore, mountains can act as barriers that prevent O_3 from dispersing.

The climate of the Project Area is generally Mediterranean in character, with cool winters (average 70° Fahrenheit [°F] in January) and warm, dry summers (average 92°F in August) (U.S. Climate Data n.d.). Temperature inversions are common, affecting localized pollutant concentrations in the winter and enhancing O_3 formation in the summer. Mountains averaging 10,000 feet in elevation tend to trap pollutants in the region by limiting air flow. Annual average rainfall is 13.99 inches, mainly falling during the winter months. Predominant wind patterns near the Project Area flow from the southwest during onshore events and from the northeast during offshore events.

2.13.2.2 Monitored Air Quality

The SCAQMD operates a network of air monitoring stations throughout the Basin to monitor air pollutants such as O_3, CO, PM_{10}, and $PM_{2.5}$. The nearest air monitoring station is the Anaheim Air Quality Monitoring Station, located at 1630 West Pampas Lane, which monitors four criteria pollutants (O_3, CO, PM_{10}, and $PM_{2.5}$). The nearest station that monitors NO_2 is the La Habra station, at 621 West Lambert Road. The air quality at these stations is representative of the air quality in the Study Area as they are in the same geographic area. Figure 2.13-1 shows the location of the air quality



Source: CARB iADAM (CARB n.d.-b) (accessed February 2023)

Figure 2.13-1: Map of the Air Quality Monitoring Stations near the Study Area

monitoring stations near the Project limits, and Table 2.13.1 lists air quality trends identified for data collected between 2017 and 2021. The California and national standards for 8-hour O_3 were exceeded in 2017 through 2020. The California standards for 1-hour O_3 were exceeded in 2018 through 2020. Both California and national standards for 1-hour and 8-hour CO were not exceeded in all 5 years. For PM_{10}, exceedances of the federal standards for 24-hour PM_{10} were not reported in any of the 5 years. The 24-hour PM_{10} and California annual PM_{10} standards were exceeded in all 5 years. For $PM_{2.5}$, exceedances of the national standards for 24-hour $PM_{2.5}$ were reported in all 5 years. Both the California and national standards for annual $PM_{2.5}$ were exceeded in 2020. The California and federal standards for 1-hour and annual NO_2were not exceeded in all 5 years.

Table 2.13.1: Air Quality Concentrations for the Past 5 Years near Project Area

Pollutant	Standard	2017	2018	2019	2020	2021
Ozone (from the Anaheim Station)						
Max 1-hour concentration (ppm)		0.090	0.112	0.096	0.142	0.089
No. days exceeded:	State: >0.09 ppm	0	1	1	6	0
Max 8-hour concentration (ppm)		0.076	0.071	0.082	0.097	0.068
No. days exceeded:	State: >0.07 ppm Federal: >0.07 ppm	4 4	1 1	1 1	15 15	0 0
Carbon Monoxide (from the Anaheim Station)						
Max 1-hour concentration (ppm)		2.5	2.3	2.4	2.3	2.1
No. days exceeded:	State: >20 ppm Federal: >35 ppm	0 0	0 0	0 0	0 0	0 0
Max 8-hour concentration (ppm)		2.1	1.9	1.3	1.7	1.5
No. days exceeded:	State: >9.0 ppm Federal: >9 ppm	0 0	0 0	0 0	0 0	0 0
PM_{10} (from the Anaheim Station)						
Max 24-hour concentration (µg/m^3)		95.7	94.6	127.6	74.8	63.6
No. days exceeded:	State: >50 µg/m^3 Federal: >150 µg/m^3	5 0	2 0	4 0	5 0	1 0
Max annual concentration (µg/m^3)		26.9	27.7	24.4	26.1	23.2
Exceeded for the year:	State: >20 µg/m^3	Yes	Yes	Yes	Yes	Yes
$PM_{2.5}$ (from the Anaheim Station)						
Max 24-hour concentration (µg/m^3)		53.9	63.1	36.1	60.2	54.4
No. days exceeded:	Federal: >35 µg/m^3	8	7	4	12	10
Max annual concentration (µg/m^3)		11.4	11.4	9.4	12.4	11.6
Exceeded for the year:	State: >12 µg/m^3 Federal: >12 µg/m^3	No No	No No	No No	Yes Yes	No No
Nitrogen Dioxide (from the La Habra Station)						
Max 1-hour concentration (ppb)		76.2	67.1	59.4	57.2	63.8
No. days exceeded:	State: >180 ppb Federal: >100 ppb	0 0	0 0	0 0	0 0	0 0
Max annual concentration (ppb)		14	13	12	12	12
Exceeded for the year:	State: >30 ppb Federal: >53 ppb	No No	No No	No No	No No	No No

Source: *Air Quality Assessment Report* (April 2023).
µg/m^3 = micrograms per cubic meter
avg. = average
max = maximum
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
ppb = parts per billion
ppm = parts per million
USEPA = United States Environmental Protection Agency

Table 2.13.2 shows the status of USEPA-approved SIPs relevant to the proposed Project.

Table 2.13.2: Status of SIPs Relevant to the Project Area

Name/Description	Status
2021 South Coast $PM_{2.5}$ Redesignation Request and Maintenance Plan	Under development by CARB
2021 South Coast PM_{10} Maintenance Plan	Submitted to USEPA on July 22, 2021
2020 South Coast $PM_{2.5}$ SIP Revision	Under development by CARB
2019 South Coast 8-Hour Ozone SIP Update	Under development by CARB
2018 South Coast SIP Revisions and Updates	Submitted to USEPA on December 20, 2018

Source: CARB, www.arb.ca.gov/our-work/programs/california-state-implementation-plans/statewide-efforts (accessed February 2023).
CAL-CET2020 = Caltrans California Construction Emissions Tools 2020
CARB = California Air Resources Board
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
SIP = State Implementation Plan
USEPA = United States Environmental Protection Agency

2.13.2.3 Criteria Pollutant Attainment/Nonattainment Status

As noted earlier, the six criteria pollutants are O_3, CO, PM (including both $PM_{2.5}$ and PM_{10}), NO_2, SO_2, and lead. The primary standards for these criteria pollutants are shown in Table 2.13.3 along with a brief description of the health effects associated with exposures to these pollutants and the typical sources of these pollutants. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, and damage to vegetation and property).

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the USEPA to identify regions as "attainment," "nonattainment," or "maintenance," depending on whether the regions meet the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of nonattainment (e.g., marginal, moderate, serious, severe, and extreme) are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS.

Table 2.13.3: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard	Federal Standard	Basin Attainment Status		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	---	Nonattainment	---	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude O_3 is almost entirely formed from ROG or VOC and NO_X in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Nonattainment	Extreme Nonattainment		
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3	Nonattainment	Attainment/ Maintenance	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
	Annual	20 µg/m^3	---	Nonattainment	Attainment/ Maintenance		
Fine Particulate Matter ($PM_{2.5}$)	24-hour	---	35 µg/m^3	Nonattainment	Moderate Nonattainment	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter—a toxic air contaminant—is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion, including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning. Also formed through atmospheric chemical (including photochemical) reactions involving other pollutants, including NO_X, SO_X, ammonia, and ROG.
	Annual	12 µg/m^3	12.0 µg/m^3	Nonattainment	Moderate Nonattainment		
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Attainment	Attainment/ Maintenance	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O_3.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Attainment	Attainment/ Maintenance		

Table 2.13.3: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard	Federal Standard	Basin Attainment Status		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	Attainment	Unclassifiable/ Attainment	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NO_X" group of O_3 precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Attainment	Attainment/ Maintenance		
Lead (Pb)	30-day average	1.5 µg/m^3	---	Attainment	Attainment	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.
	Rolling 3-month average	---	0.15 µg/m^3	Attainment	Attainment		
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	Attainment/ Unclassified	Attainment/ Unclassified	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, and steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.
	3-hour[2]	---	0.5 ppm (1,300 µg/m^3)	Attainment/ Unclassified	Attainment/ Unclassified		
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm	Attainment/ Unclassified	Attainment/ Unclassified		
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 µg/m^3)	---	Attainment/ Unclassified	---	Colorless, flammable, and poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	---	Attainment/ Unclassified	---	Neurological effects, liver damage, and cancer. Also considered a toxic air contaminant.	Industrial processes
Sulfates	24-hour	25 µg/m^3	---	Attainment/ Unclassified	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.

Table 2.13.3: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard	Federal Standard	Basin Attainment Status		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Visibility-Reducing Particles	8-hour	See footnote 2	---	Attainment/ Unclassified	---	Reduces visibility. Produces haze. Note: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See Particulate Matter, above.

Source: *Air Quality Assessment Report* (April 2023).

[1] This is a secondary standard. It is not to be exceeded more than once per year.

[2] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

--- indicates that there is no standard.

$\mu g/m^3$ = micrograms per cubic meter
Basin = South Coast Air Basin
CAAQS = California Ambient Air Quality Standards
CARB = California Air Resources Board
mg/m^3 = milligrams per cubic meter
NAAQS = National Ambient Air Quality Standards
NO_X = nitrogen oxides
ppm = parts per million
ppb = parts per billion
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
USEPA = United States Environmental Protection Agency
VOC = volatile organic compounds

The Basin's attainment status for each of the criteria pollutants is listed in Table 2.13.3.

2.13.2.4 Sensitive Receptors

Under the FCAA, ambient air quality must meet the standards for criteria air pollutants in all locations generally accessible to the public; however, some land uses are considered more sensitive to air pollution than others. Sensitive receptors are defined as facilities that house or attract children, the elderly, people with illnesses, people participating in outdoor sports, or others who are especially sensitive to the effects of air pollutants. Sensitive receptors include schools, parks, hospitals, and convalescent homes. Residential areas are also considered sensitive receptors because residents may include children, the elderly, and the infirm, and residents are often in their homes for extended periods of time. Table 2.13.4 summarizes the list of sensitive receptors' locations and distances from the Project Area. Refer to Figure 2.13-2 for a graphical representation of these sensitive receptors.

Table 2.13.4. List of Sensitive Receptors Location and Distance

ID	Sensitive Receptors	Type	Distance to Project Limits (feet)
1	Church of Jesus Christ of Latter-Day Saints	Church	697
2	Four Square Gospel Church (historical)	Church	50
3	First Church of the Nazarene	Church	369
4	First Congregational Church	Church	684
5	New Beginning Free Will Baptist Church	Church	164
6	University of California, Irvine Medical Center	Hospital	623
7	Carl E. Gilbert Elementary School	School	982
8	Grace School	School	667
9	Herbert Hoover Elementary School	School	672
10	McMillan School	School	314
11	Betsy Ross Elementary School	School	487
12	Saint Jeanne de Lestonnac School	School	210
13	James A. Whitaker Elementary School	School	611
14	Tustin High School	School	429
15	Fairmont Preparatory Academy	School	575
16	Southern California Institute of Technology	School	649
17	South Baylo University Anaheim Main Campus	School	317
18	Rancho Santiago Community College District Office	School	388
19	ITT Technical Institute	School	636

Source: *Air Quality Assessment Report.* April 2023.

Sensitive Receptors Within 1,000 ft of Project Footprint	
1	Church of Jesus Christ of Latter Day Saints
2	Four Square Gospel Church (historical)
3	First Church of the Nazarene
4	First Congregational Church
5	New Beginning Free Will Baptist Church
6	University of California Irvine Medical Center
7	Carl E Gilbert Elementary School
8	Grace School
9	Herbert Hoover Elementary School
10	McMillan School
11	Betsy Ross Elementary School
12	Saint Jeanne de Lestonnac School
13	James A Whitaker Elementary School
14	Tustin High School
15	Fairmont Preparatory Academy
16	Southern California Institute of Technology
17	South Baylo University Anaheim Main Campus
18	Rancho Santiago Community College District Office
19	ITT Technical Institute

LEGEND

Project Footprint

1,000 ft Study Area

City Boundary

Sensitive Receptors

Church

Hospital

School

0 0.75 1.5 Miles

SOURCE: Google (2022)

I:\WSP2203.07\GIS\MXD\EIR_EA\SensitiveReceptors_AQ_EIR_EA.mxd (4/3/2023)

FIGURE 2.13-2

I-5 Managed Lanes Project
(Red Hill Avenue to Orange County/Los Angeles County Line)

Sensitive Receptor Locations

EA No. 0Q950

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2.13.3 Environmental Consequence

2.13.3.1 Short-Term Impacts

Build Alternatives (Alternatives 2, 3, and 4)

Construction Air Quality Conformity

Under the transportation conformity regulations (40 CFR 93.123(c)(5)), construction-related activities that cause temporary increases in emissions are not required in a hot-spot analysis. These temporary increases in emissions are those that occur only during the construction phase and last 5 years or less at any individual site.

Construction for Alternative 2 consists of restriping and signage updates along the existing high-occupancy vehicle (HOV) lanes plus two park-and-ride lots. Construction for Alternative 3 would include the same activities as Alternative 2 but would also include construction related to ramp improvements and improvements related to a retaining wall and a soundwall. Construction for Alternative 4 would include the same activities as Alternative 3 but would also include construction of an additional Express Lane (EL) between State Route (SR) 57 and SR-91. The construction schedule for Alternative 4 has been provided below as a conservative assumption of construction duration. Construction for Alternative 4 is planned to be conducted in three main phases—two for the mainline widening and one for the tolling infrastructure—and is anticipated to start in May 2026. It is estimated to last approximately 3 years; thus, no construction activities would last more than 5 years at any individual site. Emissions from construction-related activities are thus considered temporary increased as defined in 40 CFR 93.123(c)(5) and are not required to be included in particulate matter hot-spot analyses to meet conformity requirements.

Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants (TACs), such as diesel exhaust particulate matter (DPM).

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. During construction, short-term degradation of air quality is expected from the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment powered by gasoline and

diesel engines are also anticipated and would include CO, NO_X, VOCs, directly emitted PM_{10} and $PM_{2.5}$, and TACs such as DPM. Construction activities are expected to increase traffic congestion in the area, resulting in increases in emissions from traffic during the delays. These emissions would be temporarily increased and limited to the immediate area surrounding the construction site.

The construction emissions were estimated for the Build Alternatives using the California Department of Transportation (Caltrans) California Construction Emissions Tools 2020 (CAL-CET2020), Version 1.0, which is consistent with the guidance provided by Caltrans for evaluating construction impacts from roadway projects. Tables 2.13.5, 2.13.6, and 2.13.7 present the maximum construction-related emissions during a peak construction day for each Build Alternative. The PM_{10} and $PM_{2.5}$ emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures. The emissions presented in the tables below are based on the best information available at the time of calculations and specify the following build schedules for the Build Alternatives:

- **Alternative 2:** Anticipated to take approximately 11 months beginning in 2026.
- **Alternative 3:** Anticipated to take approximately 36 months beginning in 2026.
- **Alternative 4:** Anticipated to take approximately 36 months beginning in 2026.

Additionally, the SCAQMD has established rules for reducing fugitive dust emissions. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., a minimum of twice per day), as well as Project Feature PF-AQ-1 identified below, fugitive dust and exhaust emissions from construction activities associated with the Build Alternatives would not result in any adverse air quality impacts.

PF-AQ-1 The contractor shall comply with the California Department of Transportation (Caltrans) Standard Specifications in Section 14-9 (2022) for reducing impacts from construction activities. Section 14-9.02 specifically requires compliance by the contractor with all applicable air-pollution-control rules, regulations, and ordinances related to air quality, including air quality management district rules and regulations.

Table 2.13.5: Construction Emissions for Alternative 2

Construction Phases (lbs/day)	VOC	CO	NO_x	Total PM_{10}	Total $PM_{2.5}$
Land Clearing/Grubbing	0.3	1.9	2.1	165.2	16.7
Roadway Excavation and Removal	0.7	4.5	4.8	43.6	4.7
Structural Excavation and Removal	0.1	0.3	0.7	201.7	20.2
Base/Subbase/Imported Borrow	1.0	7.0	6.7	83.0	8.8
Structure Concrete	0.3	0.7	1.3	0.1	0.1
Paving	7,351.5	1.8	4.8	0.4	0.4
Drainage/Environment/Landscaping	0.9	2.4	5.7	0.5	0.5
Traffic Signalization/Signage/ Striping/Painting	0.6	1.7	4.1	0.3	0.3
Other Operation	0.0	0.0	0.0	0.0	0.0
Maximum (lbs/day)	7,351.5	7.0	6.7	201.7	20.2
Total (Tons/Construction Project)	**77.3**	**0.3**	**0.5**	**3.7**	**0.4**

Source: *Air Quality Assessment Report* (April 2023).
CAL-CET2020 = Caltrans California Construction Emissions Tools 2020
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gases

Table 2.13.6: Construction Emissions for Alternative 3

Construction Phases (lbs/day)	VOC	CO	NO_x	Total PM_{10}	Total $PM_{2.5}$
Land Clearing/Grubbing	6.7	37.8	40.1	40.8	6.7
Roadway Excavation and Removal	16.9	108.7	113.7	21.0	9.9
Structural Excavation and Removal	4.9	13.1	27.1	55.0	7.0
Base/Subbase/Imported Borrow	24.9	175.1	168.9	32.7	15.3
Structure Concrete	7.3	19.5	34.1	2.2	2.2
Paving	1,809.8	39.1	104.8	8.2	8.0
Drainage/Environment/Landscaping	7.7	19.5	47.2	3.8	3.7
Traffic Signalization/Signage/ Striping/Painting	8.0	21.9	54.3	3.9	3.8
Other Operation	0.0	0.0	0.0	0.0	0.0
Maximum (lbs/day)	1,809.8	175.1	168.9	55.0	15.3
Total (Tons/Construction Project)	**81.9**	**22.9**	**30.5**	**6.0**	**2.7**

Source: *Air Quality Assessment Report* (April 2023).
CAL-CET2020 = Caltrans California Construction Emissions Tools 2020
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gases

Table 2.13.7: Construction Emissions for Alternative 4

Construction Phases (lbs/day)	VOC	CO	NO_x	Total PM_{10}	Total $PM_{2.5}$
Land Clearing/Grubbing	7.5	42.2	44.7	41.2	7.1
Roadway Excavation and Removal	18.8	121.3	126.9	22.1	10.9
Structural Excavation and Removal	5.4	14.7	30.3	55.2	7.2
Base/Subbase/Imported Borrow	27.8	195.5	188.6	34.3	16.8
Structure Concrete	8.1	21.8	38.1	2.5	2.4
Paving	1,811.5	43.6	117.0	9.1	9.0
Drainage/Environment/Landscaping	8.6	21.7	52.7	4.3	4.2
Traffic Signalization/Signage/Striping/ Painting	8.9	24.4	60.6	4.3	4.2
Other Operation	0.0	0.0	0.0	0.0	0.0
Maximum (lbs/day)	1,811.5	195.5	188.6	55.2	16.8
Total (Tons/Construction Project)	**82.50**	**25.6**	**34.1**	**6.3**	**2.9**

Source: *Air Quality Assessment Report* (April 2023).
CAL-CET2020 = Caltrans California Construction Emissions Tools 2020
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gases

Construction activities are expected to temporarily increase traffic congestion in the area, resulting in temporary increases in emissions from traffic during the delays. These emissions would be temporary and limited to the immediate area surrounding the construction site. Project Feature PF-AQ-1 would address temporary air quality impacts.

Naturally Occurring Asbestos

The Project Area is in Orange County, extending into Los Angeles County. This area is not generally known to contain serpentine or ultramafic rock, according to the California Department of Conservation, Division of Mines and Geology (2022). Naturally occurring asbestos (NOA) in bedrock is typically associated with serpentine and peridotite deposits. Note that during demolition activities, the likelihood of encountering structural asbestos is low due to the nature of the demolished materials. The material would consist of concrete and metal piping. Therefore, the potential for NOA to be present within the Project Area is considered to be low. Furthermore, prior to the commencement of construction, qualified geologists would further examine the soils and makeup of the existing structure. Should the Project geologist encounter asbestos during the analysis, proper procedures from 29 CFR Section 1926.1101 shall be executed to handle the materials. Therefore, the impact from NOA during construction would be minimal to none. In the unlikely event that NOA, serpentine,

or ultramafic rock is discovered, SCAQMD will be notified per Section 93105, Title 17, of the California Code of Regulations (CCR).

Lead

Lead is normally not an air quality issue for transportation projects unless the project involves disturbance of soils containing high levels of aerially deposited lead, painting, or modification of structures with lead-based coatings. The current right-of-way (ROW) within the Project Area was constructed prior to the prohibition of vehicular leaded fuels; thus, soils adjacent to paved areas within the ROW may contain aerially deposited lead from vehicle exhaust. Additionally, yellow pavement traffic markings (thermoplastic and paint) on I-5 and the arterials crossing I-5 potentially contain hazardous levels of lead chromate found in thermoplastic, and paint on the existing bridge structures constructed before 1979 that cross the Project Area may be lead-based paint. Should a Build Alternative be selected as the Preferred Alternative, Project Feature PF-HAZ-1 (described in Section 2.12) would require that studies be conducted along the I-5 ROW within the Project disturbance limits to determine whether lead contamination exists.

No Build Alternative (Alternative 1)

The No Build Alternative would not result in the construction of any improvements to I-5 in the Project Area except for ongoing and planned projects and, therefore, would not result in temporary impacts to air quality.

2.13.3.2 Permanent Impacts

Build Alternatives (Alternative 2, 3, and 4)

Regional Air Quality Conformity

The Build Alternatives are currently included in the future commitments section of the Connect SoCal 2020–2045 RTP/SCS and in the 2023 FTIP under ID No. ORA210604 (SCAG 2021a). However, the Build Alternatives are not captured in future regional models, and efforts to incorporate the Build Alternatives into such models are being taken. Once updated later in 2023, the 2020–2045 RTP and the FTIP will capture the Build Alternatives in regional models.

SCAG approved the 2020–2045 RTP/SCS on September 3, 2020 and the 2023 FTIP on October 6, 2022. FHWA approved Amendment No. 2 to the 2020–2045 RTP/SCS on December 16, 2022 and Amendment No. 23-01 to the 2023 FTIP and determined that it conforms to the SIP on January 27, 2023.

Project Level Conformity

The Project Area is within an attainment/maintenance area for federal CO standards, a nonattainment area for federal $PM_{2.5}$ standards, and an attainment/maintenance area for federal PM_{10} standards; thus, a project-level hot-spot analysis is required under 40 CFR 93.109 for all three pollutants. The results of these hot-spot analyses are provided below.

Carbon Monoxide

The methodology required for a CO local analysis is summarized in the Caltrans *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol), Sections 3 (Determination of Project Requirements) and 4 (Local Analysis).

The CO Protocol was developed for project-level conformity (hot-spot) analysis and provides two conformity requirement decision flowcharts that are designed to assist project sponsors in evaluating the requirements that apply to specific projects. The flowchart in Figure 1 of the Caltrans CO Protocol (provided as Appendix F in the *Draft Air Quality Report* [March 2023]) applies to new projects and was used in this local analysis conformity decision. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the project. The flowchart begins with Section 3.1.1:

- **3.1.1. Is this project exempt from all emissions analyses?**
  NO.

  Table 1 of the CO Protocol is Table 2 of 40 CFR 93.126. Section 3.1.1 inquires whether the Project is exempt. Such projects appear in Table 1 of the CO Protocol. None of the Build Alternatives are exempt projects listed in Table 1 of the CO Protocol; therefore, the Build Alternatives are not exempt from all emissions analyses.

- **3.1.2. Is the project exempt from regional emissions analyses?**
  NO.

  Table 2 of the CO Protocol is Table 3 of 40 CFR 93.127. The question attempts to determine whether the Build Alternatives are listed in Table 2. Projects that are included in Table 2 of the CO Protocol are exempt from regional conformity. Because Alternative 4 would expand and add traffic lanes to an existing highway, it is not exempt from regional emission analysis.

- **3.1.3. Is the project locally defined as regionally significant?**
  YES.

  As noted above, Alternative 4 will add traffic lanes to an existing highway. Therefore, Alternative 4 is regionally significant.

- **3.1.4. Is the project in a federal attainment area?**
  YES.

  The Build Alternatives are within an attainment/maintenance area for the federal CO standard; therefore, the Build Alternatives are subject to a regional conformity determination.

- **3.1.5. Is there a currently conforming RTP and TIP?**
  YES.

  3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?

  YES.

  The proposed Project is currently included in the future commitments section of the Connect SoCal 2020–2045 RTP/SCS and in the 2023 FTIP under ID No. ORA210604 (SCAG 2021a). However, the Build Alternatives are not captured in future regional models, and efforts to incorporate the Build Alternatives into such models are being taken. Once updated later in 2023, the 2020–2045 RTP and the FTIP will capture the Build Alternatives in regional models. SCAG approved the 2023 FTIP on October 6, 2022, and the FHWA both approved the 2023 FTIP and determined that it conforms to the SIP on January 27, 2023.

- **3.1.7. Has the project design concept and/or scope changed significantly from that in the regional analysis?**
  NO.

  As discussed in Section 3.1.6, regional conformity for all the Build Alternatives has been demonstrated for the FTIP. The Build Alternatives are all consistent with the proposed Project Description in the 2023 FTIP under ID No. ORA210604.

- **3.1.9. Examine local impacts.**
  Section 3.1.9 of the flowchart directs the project evaluation to Section 4 (Local Analysis) of the CO Protocol. This concludes the evaluation procedure in Figure 1 (provided as Appendix F in the *Air Quality Report* [January 2023]).

  Section 4 contains Figure 3 (Local CO Analysis). This flowchart is provided as Appendix F in the *Draft Air Quality Report* (March 2023) and is used to determine the type of CO analysis required for the Build Alternatives. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the Build Alternatives. The flowchart begins at Level 1:

- **Level 1. Is the project in a CO nonattainment area?**
  NO.

  The Project Area is in an area that has demonstrated attainment with the federal CO standard.

- **Level 1 (cont.). Was the area redesignated as "attainment" after the 1990 Clean Air Act?**
  YES.

- **Level 1 (cont.). Has "continued attainment" been verified with the local Air District, if appropriate?**
  YES.

  The USEPA designated the Basin as attainment/maintenance on June 11, 2007. The Basin has continued attainment/maintenance. (Proceed to Level 7.)

- **Level 7. Does the project worsen air quality?**
  NO.

  Because none of the Build Alternatives would meet any of the criteria discussed below, they would not potentially worsen air quality.

  a) *The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2% should be considered potentially significant.*

  The percentage of vehicles operating in cold-start mode is the same or lower for the area under study compared to those used for the area in the attainment plan

because the attainment plan analysis assumed a mix of cold and warm starts and it is assumed that all vehicles on I-5 are in a fully warmed-up mode. Therefore, this criterion is not met.

b) The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5% should be considered potentially significant. Increasing the traffic volume by less than 5% may still be potentially significant if there is also a reduction in average speeds.

The Build Alternatives would convert existing HOV lanes to ELs between Red Hill Avenue and the Orange/Los Angeles County line. Based on the annual average daily traffic (AADT) volumes along I-5 for the 2022 No Build (existing) condition, 2035 Opening Year without and with Build Alternatives, and 2055 Future Year without and with Build Alternatives, the total and truck AADT for all of the Build Alternatives would decrease compared to the No Build Alternative. In addition, the number of diesel vehicles along the proposed I-5 lanes would not significantly increase as a result of any of the Build Alternatives.

c) The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.

The projected average speeds of vehicles during peak hours would increase for all Build Alternatives compared to the No Build Alternative. The average speeds of vehicles during off-peak hours would not change. Therefore, this criterion is not met.

Based on the above Caltrans CO Protocol evaluation procedure, and using the levels and criteria in Figure 3 of the CO Protocol, the Build Alternatives would be considered satisfactory, and no further analysis is needed.

Particulate Matter (PM_{10} and $PM_{2.5}$)

A Particulate Matter Hot-Spot Interagency Review Form was submitted to the SCAG Transportation Conformity Working Group (TCWG) for the I-5 Managed Lanes Project (Red Hill Ave to Orange / Los Angeles County Line) (ORA210604) for IAC on January 24, 2023. Membership of the TCWG includes federal (USEPA, FHWA, and FTA), State (CARB and Caltrans), regional (air quality management districts and SCAG), and sub-regional (county transportation commissions) agencies and other stakeholders. Pursuant to the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG.

As discussed in Section 2.5 of this Draft EIR/EA, with the improvement of the managed lanes (MLs), all of the Build Alternatives would result in reduced PM_{10} and $PM_{2.5}$ emissions compared to the No Build Alternative under both the Opening Year (2035) and Future Year (2055) scenarios. Based on the TCWG findings in January 2023, none of the Build Alternatives would result in particulate matter emissions or hot spots as described below.

The EPA defines a project of air quality concern (POAQC) as the following:

i. New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

ii. Projects affecting intersections that are level of service (LOS) D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

iii. New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

iv. Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or

v. Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The Build Alternatives do not qualify as a POAQC because of the following:

i. The Build Alternatives would convert existing HOV lanes to ELs between Red Hill Avenue and the Orange/Los Angeles County line. Table 2.13.8 lists the AADT volumes along I-5 for the 2022 No Build (Existing) condition, 2035 Opening Year without and with Build Alternatives, and 2055 Future Year without and with Build Alternatives. The total and truck AADT for all of the Build Alternatives would decrease compared to the No Build Alternative. This table shows that the number of diesel vehicles along the proposed I-5 lanes would not significantly increase as a result of any of the Build Alternatives.

ii. The Build Alternatives do not construct or alter any intersections.

iii. The Build Alternatives do not include the construction of a new bus or rail terminal.

iv. The Build Alternatives do not expand an existing bus or rail terminal.

Table 2.13.8: Summary of Average Daily Traffic and Average SpeedsC

Condition	AADT		Average Speed During Peak Travel (mph)	Average Speed During Off-Peak Travel (mph)
	Total	Truck		
Opening Year 2035				
No Build Alternative	405,153	28,361	48	60
Build Alternative 2	390,803	27,356	50	60
Change from No Build	*-14,350*	*-1,005*	*2*	*0*
Build Alternative 3	396,196	27,734	49	60
Change from No Build	*-8,957*	*-627*	*2*	*0*
Build Alternative 4	400,435	28,030	49	60
Change from No Build	*-4,718*	*-330*	*2*	*0*
Future Year 2055				
No Build Alternative	429,402	30,058	44	60
Build Alternative 2	407,924	28,555	48	59
Change from No Build	*-21,478*	*-1,503*	*4*	*0*
Build Alternative 3	419,685	29,378	47	59
Change from No Build	*-9,717*	*-680*	*3*	*0*
Build Alternative 4	423,519	29,646	47	59
Change from No Build	*-5,883*	*-412*	*3*	*0*

Source: *Traffic Operations Analysis Report* (May 2023).
Note: Truck percentage assumed to be constant at 7 percent.
AADT = annual average daily traffic
mph = miles per hour

v. The Build Alternatives would not be located within or affect locations, areas, or categories of sites that are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Therefore, the Build Alternatives meet the FCAA requirements and 40 CFR 93.116 without any explicit hot-spot analysis. None of the Build Alternatives would create a new, or worsen an existing, PM_{10} or $PM_{2.5}$ violation.

The EPA guidance for particulate matter hot-spot analysis and interagency consultation was used to determine whether any of the Build Alternatives would be a POAQC. On January 24, 2023, the TCWG determined that none of the Build Alternatives are a POAQC. Pursuant to the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG. The Build Alternatives were approved and concurred upon by IAC at the TCWG meeting as a project not having adverse impacts on air quality, and the Build Alternatives meet the requirements of the FCAA and 40 CFR 93.116.

For the above reasons, construction and long-term operation of the Build Alternatives would be considered consistent with the purpose of the SIP in accordance with 40 CFR, Part 93, and the Build Alternatives would conform to the requirements of the FCAA.

NO_2 Analysis

The USEPA modified the NO_2 NAAQS to include a 1-hour standard of 100 parts per billion (ppb) in 2010. Currently, there is no federal project-level NO_2 analysis requirement. However, NO_2 is among the near-road pollutants of concern. The Project Area is located in an attainment/maintenance area for federal NO_2; thus, the Build Alternatives must be included in a conforming RTP and TIP. The Build Alternatives are listed in the 2023 FTIP under ID No. ORA210604. SCAG approved the 2023 FTIP on October 6, 2022, and the FHWA both approved the 2023 FTIP and determined that it conforms to the SIP on December 16, 2022. Within the Project Area, it is unlikely that NO_2 standards would be approached or exceeded based on the relatively low ambient concentrations of NO_2 in the Basin and on the long-term trend toward reduction of NO_X emissions. Additionally, all the Build Alternatives would result in lower NO_X emissions than the No Build Alternative. Because of these factors, a specific analysis of NO_2 was not conducted for any of the Build Alternatives.

Mobile-Source Air Toxics

The FHWA released updated guidance in October 2016 (FHWA 2016) for determining when and how to address Mobile Source Air Toxics (MSAT) impacts in the NEPA process for transportation projects. FHWA identified three levels of analysis:

- No analysis for exempt projects or projects with no potential for meaningful MSAT effects.

- Qualitative analysis for projects with low potential MSAT effects.
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Projects with no impacts generally include those that (a) qualify as a categorical exclusion under 23 CFR 771.117, (b) qualify as exempt under the FCAA conformity rule under 40 CFR 93.126, and (c) are not exempt, but have no meaningful impacts on traffic volumes or vehicle mix.

Projects that have low potential MSAT effects are those that serve to improve highway, transit, or freight operations or movement without adding substantial new capacity or creating a facility that is likely to substantially increase emissions. The large majority of projects fall into this category.

Projects with high potential MSAT effects include those that:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year; and
- Are proposed to be located in proximity to populated areas or, in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, or hospitals).

Based on the *CARB Land Use Handbook* (Cal/EPA and CARB 2005), it is generally recommended in California that projects perform an emissions analysis to address CEQA requirements if any of the following criteria are met:

- The project changes capacity or realigns a freeway or urban road with AADT of 100,000 or more and there are sensitive land uses within 500 feet of the roadway.
- The project changes capacity or realigns a rural road (nonfreeway) with AADT of 50,000 or more and there are sensitive land uses within 500 feet of the roadway.

In addition, explicit notice of the Project may be required to any schools and school districts that are within 0.25 mile of the Project boundaries (California Public Resource Code Section 21151.4).

FHWA guidance defines MSATs as in the 2007 USEPA regulations; however, in addition, USEPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and noncancer hazard contributors from the 2011 National Air Toxic Assessment (USEPA 2018b). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules. For CEQA analyses, DPM should be highlighted because CARB considers it to be the most important TAC.

The traffic data, along with the CT-EMFAC2017 emission rates, were used to calculate the acrolein, benzene, 1,3-butadiene, acetaldehyde, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter emissions for the Existing (2022), Opening Year (2035), and Future Year (2055) scenarios. The modeling results are summarized in Table 2.13.9.

As Table 2.13.9 shows for the MSAT emissions in 2035 and 2055, the Build Alternatives' emissions are all lower than the existing condition emissions. Because the emission effects of the Build Alternatives would be low, and emissions with the Build Alternatives would be reduced from the existing condition, it is expected that there would be no appreciable difference in overall MSAT emissions between the No Build condition and the Build Alternatives.

Long-Term Regional Vehicle Emissions Impacts

The potential impact of the proposed Project on regional vehicle emissions was calculated using traffic data for the Project region and emission rates from the Caltrans Emissions Factors Model (CT-EMFAC2017) version 1.0.3.0, which uses emission factors developed by CARB in its Emission Factor Model, Version 2017 (EMFAC2017). The emission factor data for scenario years 2022, 2035, and 2050 (CT-EMFAC2017 does not extend past 2050) were utilized with the corresponding traffic data for the 2022 No Build (Existing) condition, Opening Year (2035), and Future Year (2055) scenarios.

Table 2.13.9: Opening Year (2035) and Future Year (2055) MSAT Emissions

Alternative	MSAT Exhaust (lbs/day)								
	Acrolein	Benzene	1,3-butadiene	Acetaldehyde	DPM	Ethylbenzene	Formaldehyde	Naphthalene	Polycyclic Organic Matter
Opening Year (2035)									
Existing (2022)	0.41	8.68	1.87	4.50	16.23	3.54	11.95	0.29	0.37
No Build (2035)	0.27	5.35	1.19	2.26	7.29	2.26	6.34	0.21	0.19
Change From Existing	*-0.15*	*-3.32*	*-0.68*	*-2.24*	*-8.94*	*-1.29*	*-5.61*	*-0.08*	*-0.18*
Alternative 2 (2035)	0.25	5.06	1.13	2.15	6.73	2.13	6.01	0.19	0.18
Change From Existing	*-0.16*	*-3.62*	*-0.74*	*-2.35*	*-9.50*	*-1.41*	*-5.94*	*-0.09*	*-0.19*
Change from No Build	*-0.01*	*-0.29*	*-0.07*	*-0.11*	*-0.56*	*-0.13*	*-0.33*	*-0.01*	*-0.01*
Alternative 3 (2035)	0.25	5.04	1.13	2.10	6.92	2.13	5.92	0.19	0.18
Change From Existing	*-0.16*	*-3.64*	*-0.74*	*-2.40*	*-9.31*	*-1.42*	*-6.03*	*-0.09*	*-0.19*
Change from No Build	*-0.02*	*-0.31*	*-0.07*	*-0.16*	*-0.37*	*-0.13*	*-0.42*	*-0.01*	*-0.01*
Alternative 4 (2035)	0.25	5.12	1.14	2.12	7.13	2.16	5.99	0.20	0.18
Change From Existing	*-0.16*	*-3.56*	*-0.73*	*-2.37*	*-9.11*	*-1.38*	*-5.95*	*-0.09*	*-0.19*
Change from No Build	*-0.01*	*-0.24*	*-0.05*	*-0.13*	*-0.16*	*-0.10*	*-0.35*	*-0.01*	*-0.01*
Future Year (2055)									
Existing (2022)	0.41	8.68	1.87	4.50	16.23	3.54	11.95	0.29	0.37
No Build (2055)	0.26	5.39	1.20	2.55	7.42	2.26	6.88	0.22	0.18
Change From Existing	*-0.15*	*-3.28*	*-0.67*	*-1.95*	*-8.82*	*-1.28*	*-5.07*	*-0.06*	*-0.19*
Alternative 2 (20355)	0.24	4.97	1.11	2.37	6.86	2.08	6.38	0.21	0.17
Change From Existing	*-0.17*	*-3.70*	*-0.76*	*-2.13*	*-9.37*	*-1.46*	*-5.57*	*-0.08*	*-0.20*
Change from No Build	*-0.02*	*-0.42*	*-0.09*	*-0.18*	*-0.55*	*-0.18*	*-0.50*	*-0.02*	*-0.01*
Alternative 3 (2055)	0.25	5.10	1.13	2.40	7.04	2.14	6.48	0.21	0.17
Change From Existing	*-0.16*	*-3.58*	*-0.74*	*-2.10*	*-9.19*	*-1.41*	*-5.46*	*-0.08*	*-0.20*
Change from No Build	*-0.01*	*-0.30*	*-0.07*	*-0.15*	*-0.37*	*-0.12*	*-0.39*	*-0.01*	*-0.01*
Alternative 4 (2055)	0.25	5.12	1.14	2.38	7.28	2.15	6.45	0.21	0.17
Change From Existing	*-0.16*	*-3.56*	*-0.73*	*-2.12*	*-8.95*	*-1.39*	*-5.49*	*-0.07*	*-0.20*
Change from No Build	*-0.01*	*-0.27*	*-0.06*	*-0.17*	*-0.14*	*-0.11*	*-0.42*	*-0.01*	*-0.01*

Source: *Air Quality Assessment Report* (April 2023).
DPM = diesel particulate matter
EMFAC = Emission Factor Model
lbs/day = pounds per day
MSAT = Mobile Source Air Toxics

Table 2.13.10 shows the vehicle emissions from traffic on I-5 for the 2022 No Build (Existing) condition, Opening Year (2035) without and with Project, and Future Year (2055) without and with Project scenarios. This shows that in all cases, the emissions from a Build Alternative are less than both the Existing scenario and the corresponding No Build Alternative.

Table 2.13.10. Summary of Comparative Emissions Analysis

Condition	CO (lbs/day)	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Opening Year (2035)					
Existing (2022)	8,493	277	1,793	1,228	346
No Build Alternative	5,734	167	943	1,245	332
Change from Existing	*-2,758*	*-111*	*-849*	*17*	*-14*
Alternative 2	5,348	157	896	1,150	307
Change from Existing	*-3,145*	*-120*	*-896*	*-78*	*-39*
Change from No Build	*-387*	*-9*	*-47*	*-95*	*-25*
Alternative 3	5,433	157	892	1,182	315
Change from Existing	*-3,059*	*-121*	*-900*	*-46*	*-31*
Change from No Build	*-301*	*-10*	*-51*	*-63*	*-17*
Alternative 4	5,562	159	905	1,216	324
Change from Existing	*-2,931*	*-118*	*-887*	*-12*	*-22*
Change from No Build	*-173*	*-8*	*-38*	*-29*	*-8*
Future Year (2055)					
Existing (2022)	8,493	277	1,793	1,228	346
No Build Alternative	5,747	168	936	1,296	338
Change from Existing	*-2,746*	*-109*	*-857*	*68*	*-9*
Alternative 2	5,218	155	855	1,178	307
Change from Existing	*-3,274*	*-122*	*-937*	*-51*	*-39*
Change from No Build	*-528*	*-13*	*-80*	*-118*	*-31*
Alternative 3	5,412	159	881	1,223	318
Change from Existing	*-3,081*	*-119*	*-912*	*-6*	*-28*
Change from No Build	*-335*	*-9*	*-55*	*-74*	*-19*
Alternative 4	5,516	159	881	1,259	328
Change from Existing	*-2,976*	*-118*	*-911*	*-30*	*-19*
Change from No Build	*-230*	*-9*	*-54*	*-38*	*-10*

Source: *Air Quality Assessment Report* (April 2023).
CO = carbon monoxide
CT-EMFAC2017 = Caltrans Emissions Factor Model
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gases

No Build Alternative (Alternative 1)

As shown in Table 2.13.10 above, the air pollutant emissions for the No Build Alternative are forecasted to be lower than the existing conditions and slightly higher than the emissions for the Build Alternatives.

Other current or planned projects are subject to discretionary review to ensure that no long-term adverse air quality impacts would occur. Therefore, the No Build Alternative would not result in permanent adverse air quality impacts.

2.13.4 Avoidance, Minimization, and/or Mitigation Measures

The Build Alternatives will incorporate Project Features, as outlined above in Section 2.13.3.1, to help address potential short-term impacts related to construction. No avoidance, minimization, and/or mitigation is required .

During operation, no avoidance, minimization, and/or mitigation measures are required, as the Build Alternatives would not produce substantial operational air quality impacts.

2.13.5 Climate Change

Neither the USEPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. The FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the Section 3.2 of the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the proposed Project.

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