4.6 Air Quality

4.6.1 Regulatory Framework and Methodology

4.6.1.1 Regulatory Framework

The applicable federal, state, and local regulations that are relevant to an analysis of the proposed project's air quality impacts are listed below. For additional information regarding these regulations, please see the Air Quality Technical Report in Appendix L of this Draft EIS/EIR.

Federal

- Federal Clean Air Act (CAA);
- Transportation Conformity Requirements; and
- Mobile-Source Air Toxics.

State

- California Clean Air Act.

Local

- South Coast Air Quality Management District's, Air Quality Management Plan; and
- Regional Comprehensive Plan.

4.6.1.2 Methodology

The proposed project would generate construction-related and operational emissions. The methodology used to evaluate construction and operational effects is described below.

Project construction would be a source of fugitive dust and exhaust emissions that could have temporary effects on local air quality. Such emissions would result from earthmoving and the use of heavy equipment as well as land clearing, ground excavation, cut-and-fill operations, and the reconstruction of roadways. Dust emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. A major portion of dust emissions for the proposed project would most likely be caused by construction traffic in temporary construction areas.

Construction emissions have been quantified (see Section 4.6.3 below) using the CalEEMod model, which has been approved by the South Coast Air Quality Management District (SCAQMD) for emissions estimation within the South Coast Air Basin (Basin). To determine the significance of potential construction air quality impacts, the calculated daily emissions were measured against applicable SCAQMD local and regional significance thresholds.

The durations of construction used for the purposes of calculating construction-period emissions are shorter or equal to those discussed in the February 2015 Construction Methods and Impacts Report. Although they may differ, the compressed construction schedule for the purposes of calculating emissions represents a conservative approach in that emissions are concentrated into a

shorter timeframe, thereby yielding higher estimates of single-day maximums. Actual single-day emissions could be less than those identified in this section, but this DEIS-DEIR assumes a "worst-case" scenario if construction were to be done under a compressed schedule. If construction actually occurs under a longer schedule, single-day emissions would be less than what was analyzed for this DEIS-DEIR.

The primary operational emissions associated with the proposed project would be carbon monoxide (CO), fine particulate matter (PM_{10} and $PM_{2.5}$), ozone precursors (reactive organic gasses [ROG] and nitrogen oxides [NO_X]), and carbon dioxide (CO_2) emitted as vehicle exhaust. In addition to emissions from vehicle exhaust, PM_{10} and $PM_{2.5}$ can result from vehicular travel on paved roads (entrained dust). With respect to criteria pollutants, the evaluation of transportation conformity is done by affirming that the proposed project is included in the currently conforming RTP and FTIP modeling lists. In addition, estimates of criteria pollutant exhaust emissions (ozone precursors, CO, PM_{10}, and $PM_{2.5}$) are quantified by using CT-EMFAC2014 emissions factors. Re-entrained dust emissions are calculated using the emission factor equation found in the EPA's Compilation of Air Pollutant Emission Factors, AP-42, Section 13.2.1.[1]

Each of the build alternatives was compared against existing conditions, which "normally constitute[s] the baseline physical conditions by which a lead agency determines whether an impact is significant," under Section 15125(a) of the CEQA Guidelines. Because Alternative 3 would have the greatest traffic impacts, the Existing (2012) with Alternative 3 scenario presents the worst-case for air quality relative to any of the other "Existing Plus Project" scenarios. Thus, in order to evaluate, analyze and compare each of the alternatives, the qualitative analysis for the other build alternatives extrapolates from the quantitative analysis for the Existing with Alternative 3 scenario. In addition, the emissions of each of the build alternatives have been evaluated against the No-Build Alternative for a future baseline (2040) analysis.

The potential impacts related to localized CO hot-spot emissions are evaluated following the methodology prescribed in the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) developed for the California Department of Transportation (Caltrans) by the Institute of Transportation Studies at the University of California, Davis.[2] The potential impacts related to localized particulate matter were evaluated using the EPA and FHWA's guidance manual, Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas.[3] MSAT emissions were evaluated using FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents[4] and California-specific guidance from Caltrans.[5,6]

[1] U.S. Environmental Protection Agency. 2013b. *Compilation of Air Pollutant Emission Factors*. AP-42, Section 13.2.1.
[2] Garza, V., P. Graney, D. Sperling. 1997. *Transportation Project-level Carbon Monoxide Protocol.* Developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis.
[3] U.S. Environmental Protection Agency and Federal Highway Administration. 2015. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas.*
[4] Federal Highway Administration. 2016. *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. October.
[5] Brady, Mike. January 6, 2010—email to ICF regarding the analysis of MSATs in Caltrans documents.
[6] California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* Available: <http://www.arb.ca.gov/ch/landuse.htm>. April.

Transportation Conformity

Regional Conformity

The proposed project is located in an extreme nonattainment area for the federal 8-hour ozone standard. The extreme nonattainment designation differs from other nonattainment designations because the South Coast Air Basin has greater pollutant concentrations than other nonattainment areas and has therefore been granted a longer compliance schedule under the federal CAA. Because ozone and its precursors are regional pollutants, the proposed project must be evaluated under the transportation conformity requirements described earlier. An affirmative regional conformity determination must be made before the proposed project can proceed. A determination of conformity can be made if the proposed project is described, as currently proposed, in an EPA-approved RTP and FTIP.

Project-Level Conformity

The proposed project is located in an attainment/maintenance area for the federal CO standard. Consequently, the evaluation of transportation conformity for CO is required. The CO transportation conformity analysis is based on the CO Protocol. The CO Protocol details a qualitative step-by-step procedure to determine whether project-related CO concentrations have the potential to generate new air quality violations, worsen existing violations, or delay attainment of the CAAQS or NAAQS for CO. If the screening procedure reveals that such a potential may exist, then the CO protocol details a quantitative method to ascertain project-related CO impacts.

The proposed project is located in an attainment/maintenance area for the federal PM_{10} standard and a nonattainment area for the federal $PM_{2.5}$ standard. On March 10, 2006, EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality effects in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. The final rule requires PM_{10} and $PM_{2.5}$ hot-spot analyses to be performed for any Project of Air Quality Concern (POAQC) or any other project identified by the $PM_{2.5}$ State Implementation Plan (SIP) as a localized air quality concern.

In December 2010, FHWA and EPA issued a guidance document titled *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*.[7] POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern.

Because the proposed project would be located in an area classified as a nonattainment area for the $PM_{2.5}$ standards, a determination must be made as to whether it would result in a PM_{10} or $PM_{2.5}$ hot spot. This determination will be made by the SCAG Transportation Conformity Working Group (TCWG).

[7] U.S. Environmental Protection Agency and Federal Highway Administration. 2015. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas.*

4.6.1.3 CEQA Significance Thresholds

CEQA requires state and local government agencies to identify the significant environmental effects of proposed actions; however, CEQA does not describe specific significance thresholds. According to the Governor's Office of Planning and Research, significance thresholds for a given environmental effect are at the discretion of the Lead Agency and are at the levels at which the Lead Agency finds the effects of the project to be significant.[8]

The State CEQA Guidelines define a significant effect on the environment as: "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance" (State CEQA Guidelines, Section 15382).

The State CEQA Guidelines do not describe specific significance thresholds. However, Appendix G of the State CEQA Guidelines lists a variety of potentially significant effects, which are often used as thresholds or guidance in developing thresholds for determining impact significance.

As outlined in Appendix G, a project may have a significant effect on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality management plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; or
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

The State CEQA Guidelines also state that the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the determinations above.

Based on the SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies outlined in the SCAQMD *CEQA Air Quality Handbook* (as updated per their website), *Localized Significance Threshold Methodology for CEQA Evaluations*, and *Particulate Matter (PM) $_{2.5}$ Significance Thresholds and Calculation Methodology* guidance documents were used in evaluating project impacts.[9,10]

[8] OPR (State of California, Governor's Office of Planning and Research). 2016. *2016 California Environmental Quality Act (CEQA Statute and Guidelines*. Available: <http://resources.ca.gov/ceqa/docs/2016_CEQA_Statutes_and_Guidelines.pdf >. Accessed: July 11, 2016.

[9] South Coast Air Quality Management District. 2003. *Localized Significance Threshold Methodology for CEQA Evaluations*. June.

[10] South Coast Air Quality Management District. 2006. *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology*. October.

Construction Emissions

According to criteria set forth in the SCAQMD CEQA Air Quality Handbook, Localized Significance Threshold Methodology for CEQA Evaluations, and Particulate Matter ($PM_{2.5}$ Significance Thresholds and Calculation Methodology guidance documents, the project would have a significant impact on construction emissions if any of the following were to occur:

- Regional emissions from both direct and indirect sources exceed any of the following SCAQMD prescribed threshold levels: (1) 75 pounds a day for ROG, (2) 100 pounds per day for NO_X, (3) 550 pounds per day for CO, (4) 150 pounds per day for PM_{10} or sulfur oxides (SO_X), and (5) 55 pounds per day for $PM_{2.5}$; or
- Localized emissions from on-site construction equipment and site disturbance activity exceed any of the following SCAQMD-prescribed threshold levels: (1) 80 pounds per day for NO_X, (2) 498 pounds per day for CO, (3) 5 pounds per day for PM_{10}, and (4) 3 pounds per day for $PM_{2.5}$.[11]

The SCAQMD thresholds are used as the basis for the determination of significance for construction-period emissions.

Operations Emissions

According to criteria set forth in the SCAQMD *CEQA Air Quality Handbook*, the project would have a significant impact with regard to operational emissions if:

- Regional emissions from both direct and indirect sources would exceed any of the following SCAQMD prescribed threshold levels: (1) 55 pounds a day for ROG, (2) 55 pounds per day for NO_X, (3) 550 pounds per day for CO, (4) 150 pounds per day for PM_{10} or SO_X, and (5) 55 pounds per day for $PM_{2.5}$ (South Coast Air Quality Management District 1993 and 2006);
- Localized emissions from on-site sources exceed any of the following SCAQMD prescribed threshold levels: (1) 80 pounds per day for NO_X, (2) 498 pounds per day for CO, (3) 1 pounds per day for PM_{10}, and (4) 1 pounds per day for $PM_{2.5}$;[12] or
- The project would cause an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9 ppm, respectively, at an intersection or roadway within 0.25 mile of a sensitive receptor.[13]

The SCAQMD thresholds are used as the basis for the determination of significance for operational emissions.

Toxic Air Contaminant Emissions

According to guidelines provided in the SCAQMD *CEQA Air Quality Handbook*, the project would have a significant impact from toxic air contaminants (TACs) if:

- On-site stationary sources emit carcinogenic or TACs that individually or cumulatively exceed the maximum individual cancer risk of ten in one million (1.0 x 10-5) or an acute or chronic hazard index of 1.0;

[11] Derived from SCAQMD Localized Significance Threshold Tables—SRA 7 (East San Fernando Valley), 1-acre site, 25-meter receptor distance.
[12] Ibid.
[13] Where the CO standard is exceeded at the intersection, a project would result in a significant impact if the incremental increase due to the project is equal to or greater than 1.0 ppm for the California 1-hour CO standard or 0.45 ppm for the 8-hour CO standard.

- Hazardous materials associated with on-site stationary sources result in an accidental release of air toxic emissions or acutely hazardous materials, posing a threat to public health and safety; or
- The project would be occupied primarily by sensitive individuals within 0.25 mile of any existing facility that emits TACs, which could result in a health risk from pollutants identified in District Rule 1401.[14]

L.A. CEQA Thresholds Guide

The *L.A. CEQA Thresholds Guide* identifies the SCAQMD significance criteria, described above, to determine impacts.

4.6.1.4 Sensitive Receptors

Some population groups, such as children, the elderly, and acutely and chronically ill persons, especially those with cardio-respiratory diseases, are considered more sensitive to air pollution than others. Sensitive receptors within the project vicinity include multi-family residential land uses and schools located along the routes. Proposed construction activities would occur adjacent to sensitive receptors in some instances; for analysis purposes, however, a 25-meter receptor distance was used in the evaluation of localized impacts, as the SCAQMD localized significance threshold for a 25-meter receptor distance is the most conservative published threshold. The 25-meter receptor distance allows for the lowest emissions, and is therefore most protective of health.

4.6.2 Affected Environment/Existing Conditions

4.6.2.1 Description of Relevant Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. These regulated air pollutants are known as "criteria air pollutants" and are categorized as primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide, ROGs, NO_X, sulfur dioxide (SO_2), and most fine particulate matter (PM_{10}, $PM_{2.5}$), including lead (Pb) and fugitive dust, are primary air pollutants. Of these, CO, SO_2, PM_{10}, and $PM_{2.5}$ are criteria pollutants. ROG and NO_X are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone and nitrogen dioxide (NO_2) are the principal secondary pollutants.

The proposed project is located within the Los Angeles County portion of the Basin that fails to meet federal standards for ozone (O_3), particulate matter ($PM_{2.5}$) and lead (Pb) and, therefore, is considered a federal nonattainment area for those pollutants.

Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation.[15]

[14] South Coast Air Quality Management District. 1993. *CEQA Air Quality Handbook*. November.
[15] South Coast Air Quality Management District. 2005. *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*.

Reactive Organic Gases (ROG) are compounds made up primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROG but rather by reactions of ROG to form secondary pollutants such as ozone.[16]

Nitrogen Oxides (NO_X) serve as integral participants in the process of photochemical smog production. The two major forms of NO_X are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. NO_X acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Nitrogen Dioxide (NO_2) is a by-product of fuel combustion. The principal form of NO_2 produced by combustion is NO, but NO reacts with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. 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 parts per million (ppm). NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM10. NO_X are also precursors to the formation of both O_3 and PM2.5.[17,18]

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. Fuel combustion is the primary source of SO_2. At high concentrations SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. A primary source of SO_2 emissions is high sulfur content coal. Gasoline and natural gas have very low sulfur content and hence do not release significant quantities of SO_2.[19]

Particulate Matter (PM) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized. Inhalable course particles, or PM10, include the particulate matter with a diameter of 10 microns (10 millionths of a meter or 0.0004 inch) or less. Inhalable fine particles, or PM2.5, have a diameter of 2.5 microns (i.e., 2.5 millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Both PM10 and PM2.5 may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.[20]

[16] *Ibid*.
[17] *Ibid.;* South Coast Air Quality Management District. 2007 *Air Quality Management Plan*.
[18] South Coast Air Quality Management District. 2005. *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*.
[19] Ibid.
[20] Ibid.

Fugitive dust primarily poses two public health and safety concerns. The first concern is that of respiratory problems attributable to the particulates suspended in the air. The second concern is that of motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong windstorms by acting as an abrasive material agent (much like sandblasting).[21]

Ozone (O_3), or smog, is one of a number of substances called photochemical oxidants that are formed when ROG and NO_X (both by-products of the internal combustion engine) react with sunlight. O_3 is present in relatively high concentrations in the South Coast Air Basin (Basin or SCAB), and the damaging effects of photochemical smog are generally related to the concentrations of O_3. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Additionally, O_3 has been tied to crop damage, typically in the form of stunted growth and premature death. O_3 can also act as a corrosive, resulting in property damage such as the degradation of rubber products.[22]

Toxic Air Contaminants

With respect to criteria pollutants, federal and state ambient air quality standards (AAQS) represent the exposure level (with an adequate margin of safety) deemed safe for humans. No AAQS exist for TACs because there is no exposure level deemed safe for humans. Pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor, called a Hazard Index, is used to evaluate risk. In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807, CARB 1999) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, CARB 1999) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, CARB identified particulate emissions from diesel-fueled engines as TACs. In September 2000, CARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM_{10} emissions and the associated health risk by 85% by 2020.

4.6.2.2 Regional Setting

The project site is located within the South Coast Air Basin, an approximately 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The terrain and geographical location determine the distinctive climate of the Basin, which is a coastal plain with connecting broad valleys and low hills.

[21] Ibid.
[22] Ibid.

The Southern California region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography) and human influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and dispersion of pollutants throughout the Basin, making it an area of high pollution potential.

The greatest air pollution impacts throughout the Basin occur from June through September. These are attributed to the large amount of pollutant emissions, light winds, and shallow vertical atmospheric mixing, which frequently reduce pollutant dispersion, thus causing elevated air pollution levels. Pollutant concentrations in the Basin vary with location, season, and time of day. Ozone concentrations, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the Basin and adjacent desert. Over the past 30 years, substantial progress has been made in reducing air pollution levels in southern California.

The SCAQMD has recently completed the Multiple Air Toxics Exposure Study IV (MATES IV), which was an ambient air monitoring and evaluation study conducted in the Basin.[23] MATES IV was a follow-up to previous air toxics studies in the Basin and is part of the SCAQMD Governing Board Environmental Justice Initiative. Compared to previous studies of air toxics in the Basin, MATES IV found a decreasing risk for air toxics exposure, with the population weighted risk down by 57% from the analysis in MATES III. While there has been improvement in air quality regarding air toxics, the risks are still unacceptable and are higher near sources of emissions such as ports and transportation corridors. Diesel particulate matter continues to dominate the risk from air toxics. The highest risks are found near the port area, an area near central Los Angeles, and near transportation corridors. The results from the MATES IV study underscore that a continued focus on reduction of toxic emissions, particularly from diesel engines, is needed to reduce air toxics exposure.

The MATES IV study concluded that the average carcinogenic risk throughout the Basin, attributed to TACs, is approximately 418 in one million. As the MATES-IV study was being prepared, the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA) adopted revised methods for estimating cancer risks, which resulted in a Basin-wide cancer risk of 1,023 in one million. This revised figure represents a change in methodology of risk calculations taking into account age sensitivity factors and breathing rates to a greater extent than previous efforts. Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors, at 90%. About 68% of all risk is attributed to diesel particulate matter emissions.

4.6.2.3 Local Climate

Local climate conditions are considered, as they affect the dispersion and chemical reactions of air pollutants. Data from the Western Regional Climate Center's San Fernando climate monitoring station were used to characterize the eastern project vicinity climate conditions because it is nearest to the project alignment. The average project study area summer (August) high and low

[23] South Coast Air Quality Management District. 2015. *Final Report: Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-IV)*. May. Available : < http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7>. Accessed: July 11, 2016.

temperatures are 92.2 degrees Fahrenheit (°F) and 56.3°F, respectively, while the average winter (January) high and low temperatures are 65.0°F and 42.8°F, respectively. The average annual rainfall is 17.7 inches.[24]

The wind monitoring station located nearest to the project site is in Reseda; therefore, data from the Reseda wind monitoring station was used to characterize project study area wind conditions. Wind patterns (provided in the appendix to the Air Quality Technical Report – see Appendix L) in the project vicinity display a multi directional flow, with winds primarily from the east–southeast, at an average speed of 4 miles per hour. Calm wind conditions are present 12% of the time.

4.6.2.4 Project Vicinity Mobile-Source Emissions

The estimate of daily vehicle miles traveled (VMT) that occurs within the project vicinity under the existing/baseline condition is approximately 5.3 million. The estimate of local mobile source emissions generated by this existing level of VMT is included in the Air Quality Technical Report in Appendix L.

4.6.2.5 Local Ambient Pollutant Concentrations

SCAQMD has divided the Basin into air monitoring areas and maintains a network of air quality monitoring stations located throughout the Basin. The project site is located in the Eastern San Fernando Valley Monitoring Area (i.e., Source Receptor Area [SRA] Number 7), which was served by the Burbank-West Palm Avenue monitoring station through mid-2014. Monitoring data is presented below in Table 4.6-1.

Using existing (2013) traffic data, local CO concentrations were calculated at the most congested intersections within the project vicinity. Of the 83 intersections that were evaluated for project traffic impacts, 14 were selected for the CO hot-spot assessment. Intersections that currently operate at congested levels of service (LOS) D, E, and/or F during either the AM or PM peak hour were modeled. If the intersection was LOS D, E, or F during either the AM or PM peak hour, that intersection was modeled for both periods. The local CO concentrations are presented below in Table 4.6-2. As shown therein, 1-hour and 8-hour concentrations are below the respective CAAQS of 20 parts per million (ppm) and 9.0 ppm, respectively, at all intersection locations.

[24] Western Regional Climate Center. 2013. *Los Angeles Area, California Climate Summaries.* San Fernando, California (047759). Available: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5115>. Accessed: July 29, 2013.

Table 4.6-1: Air Quality Data from Burbank-West Palm Avenue Station (CARB 70069)

Pollutant Standards	2013	2014	2015
Ozone (O_3)			
State Standard (1-Hour Average = 0.09 ppm); National Standard (8-Hour Average = 0.075 ppm)			
Maximum Concentration 1-Hour Period (ppm)	0.110	0.091	N/A
Maximum Concentration 8-Hour Period (ppm)	0.083	0.079	N/A
Days State 1-Hour Standard Exceeded	4	0	N/A
Days National 8-Hour Standard Exceeded	6	1	N/A
Nitrogen Dioxide (NO_2)			
State Standard (1-Hour Average = 0.18 ppm)			
Maximum 1-Hour Concentration	0.072	0.073	N/A
Days State Standard Exceeded	0	0	N/A
Suspended Particulates (PM_{10})			
State Standard (24-Hour Average = 50 µg/m³); National Standard (24-Hour Average = 150 µg/m³)			
Maximum State 24-Hour Concentration	51	58	N/A
Maximum National 24-Hour Concentration	53	68	N/A
Days Exceeding State Standard	1	1	N/A
Days Exceeding National Standard	0	0	N/A
Suspended Particulates ($PM_{2.5}$)			
National Standard (24-Hour Average = 35 µg/m³)			
Maximum 24-Hour Concentration	45.1	64.6	N/A
Days Exceeding National Standard	4	2	N/A
Notes: Monitoring data summaries provided in the appendix. ppm = parts per million µg/m³ = microgram per cubic meter N/A = Data not available; the Burbank-West Palm Avenue Station closed June 30, 2014. Source: California Air Resources Board 2016.			

Table 4.6-2: Baseline Conditions (Year 2013) at Congested Intersections—Local Area Carbon Monoxide Concentrations

Intersection	Peak Period[a]	Maximum 1-Hour Concentration (ppm)[b]	Maximum 8-Hour Concentration (ppm)[e]
San Fernando Rd & Paxton St	AM	7.9	6.5
	PM	8.1	6.6
Laurel Canyon Blvd & Van Nuys Blvd	AM	8.2	6.7
	PM	8.2	6.7
Arleta Ave & Van Nuys Blvd	AM	8.1	6.6
	PM	8.2	6.7
Van Nuys Blvd & Nordhoff St	AM	8.0	6.6
	PM	8.2	6.7
Van Nuys Blvd & Chase St	AM	8.0	6.6
	PM	7.7	6.3
Van Nuys Blvd & Saticoy St	AM	8.2	6.7
	PM	8.2	6.7
Van Nuys Blvd & Sherman Way	AM	7.9	6.5
	PM	8.2	6.7
Van Nuys Blvd & Vanowen St	AM	8.0	6.6
	PM	8.2	6.7
Van Nuys Blvd & Burbank Blvd	AM	8.4	6.8
	PM	8.7	7.0
Van Nuys Blvd & Magnolia Blvd	AM	8.3	6.8
	PM	8.2	6.7
Van Nuys Blvd & Ventura Blvd	AM	8.0	6.6
	PM	8.0	6.6
Sepulveda Blvd & Burbank Blvd	AM	8.5	6.9
	PM	8.6	7.0
Sepulveda Blvd & Magnolia Blvd	AM	7.8	6.4
	PM	7.9	6.5
Sepulveda Blvd & Ventura Blvd	AM	7.9	6.5
	PM	8.7	7.0

Notes:
ppm = parts per million
Source: ICF Caline4 and EMFAC Emissions Modeling, SCAQMD 2003, KOA 2013.

4.6.2.6 Existing Health Risk in Surrounding Area

According to the most current SCAQMD inhalation cancer risk data (Mobile Air Toxics Exposure Study MATES IV Carcinogenic Interactive Map), the project study area is located within a cancer risk zone of approximately 640 to 1,040 cases per one million people.[25] This is largely due to the project study area's proximity to the Interstate 405, Interstate 5, State Route 210 and State Route 118 freeways. The alignment travels through 11 different areas mapped by MATES-IV; the alignment travels through only one area that has a higher cancer risk than the Basin-wide average. For comparison, the average cancer risk in the Basin is 1,023 cases per million people. The purpose of the comparison is to demonstrate that the existing risks in the study area are not substantially different than the Basin-wide average. There are 11 different areas that the alignment runs through (from the MATES-IV interactive map), each with its own cancer risk. Only one of the 11 areas through which the alignment runs would be greater than the Basin-wide average cancer risk.

4.6.3 Environmental Consequences, Impacts, and Mitigation Measures

4.6.3.1 No-Build Alternative

Construction Impacts

While the No-Build Alternative would not preclude: 1) future construction of other transportation system improvements, 2) general maintenance to improve local transportation system operation, or 3) incorporation of safety enhancements, none of the project improvements proposed under the TSM Alternative or Alternatives 1 to 4 would occur under the No-Build Alternative. Since no improvements would be constructed under the No-Build Alternative, and because it is not considered to be a "project" under CEQA or NEPA, it would not result in any construction impacts and no further analysis is required.

Operational Impacts

Regional Criteria Pollutant Emissions

The No-Build Alternative would not include any project improvements and would not generate any operational air quality impacts. However, under the No-Build Alternative, emissions would continue to be generated in the future by motor vehicles operating in the study area. The regional VMT and travel speed profile predicted to occur under the No-Build Alternative (i.e., year 2012 and 2040 baseline scenarios) would generate the regional emissions estimates presented in Table 4.6-3. The emissions of each of the build alternatives have been evaluated against the No-Build Alternative (i.e., future year 2040 baseline) emissions (see Table 4.6-3) to determine the impacts of the build alternatives under CEQA and NEPA.

[25] South Coast Air Quality Management District. n.d. *Draft Mobile Air Toxics Exposure Study MATES IV Carcinogenic Risk Interactive Map.* Available: http://www3.aqmd.gov/webappl/OI.Web/OI.aspx?jurisdictionID=AQMD.gov&shareID=73f55d6b-82cc-4c41-b779-4c48c9a8b15b. Accessed: July 11, 2016.

Table 4.6-3: No-Build Alternative Regional Criteria Pollutant Emissions (2012 and 2040)

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
2012 No Build	187,182	2,223,083	707,749	63,339	33,706
2040 No Build	60,862	530,143	168,455	62,523	25,606
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Localized Criteria Pollutant Emissions

Within an urban setting, vehicle exhaust is the primary source of localized pollutant concentrations. The primary localized pollutants of concern are CO and PM. Discussions of each pollutant are provided below.

Carbon Monoxide Hot-spot Analysis

The highest CO concentrations are generally found close to congested intersections. Local CO concentrations are a function of intersection LOS. Higher CO concentrations are found at poor LOS intersection locations (i.e., LOS D through F). Under typical meteorological conditions, CO concentrations tend to decrease as the distance from the emissions source (i.e., congested intersection) increases. For purposes of providing a conservative worst-case impact analysis, CO concentrations are typically analyzed at the most congested intersection locations. If impacts are less than significant at congested intersection locations, impacts would also be less than significant at more distant sensitive receptor locations.

The No-Build Alternative proposes no project improvements and thus would not result in any CO impacts. However, No-Build Alternative (i.e., future 2040 baseline) conditions provide the basis against which to compare the proposed build alternatives. Specifically, the potential for local traffic redistribution to occur as a result of improvements under the build alternatives and could result in changes in LOS and delay. As a consequence, in the discussions for the build alternatives below, the build alternatives intersection LOS and delay statistics have been compared to No-Build Alternative (future year 2040 baseline) conditions to identify intersections where LOS and delay statistics would worsen. Identified intersection locations have been evaluated for local CO impacts under each build alternative discussion below. No-Build Alternative intersection LOS and delay statistics information is provided in the Air Quality Technical Report in Appendix L.

Particulate Matter Hot-spot Analysis

EPA specifies in 40 CFR 93.123(b)(1) that only "projects of air quality concern" are required to undergo a $PM_{2.5}$ and PM_{10} hot-spot analysis. EPA defines projects of air quality concern as certain highway and transit projects that involve significant levels of diesel traffic or any other project that is identified by the PM2.5 SIP as a localized air quality concern. Since the No-Build Alternative is not considered to be a "project" under CEQA or NEPA, no evaluation of the impacts of the No-Build Alternative is required.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under the No-Build Alternative (i.e., future year 2040 baseline conditions) would generate the regional MSAT emissions estimates presented in Table 4.6-4. Build alternative MSAT emissions have been evaluated (see discussions below for Alternatives 1 to 4) against these No-Build Alternative (future 2040 baseline) MSAT emissions to determine the build alternatives' impacts under CEQA and NEPA.

Table 4.6-4: No-Build Alternative MSAT Emissions

Pollutant Name	Daily Emissions
	Pounds per Day[26]
Benzene	1,302
Acrolein	39
Acetaldehyde	1,053
Formaldehyde	2,379
Butadiene	196
Naphthalene	75
POM	38
Diesel PM	497
DEOG	12,356
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.	

Cumulative Impacts

The No-Build Alternative does not include any new project improvements that would occur under the TSM or build alternatives and thus would not result in additional pollutant emissions that would contribute to cumulative air quality impacts.

Mitigation Measures

Construction Mitigation Measures

No construction mitigation measures are required.

Operational Mitigation Measures

No operational mitigation measures are required.

[26] It should be noted that there are no quantitative thresholds for MSATs as there are for criteria pollutants, and this analysis follows FHWA guidance by quantifying project impacts with respect to MSATs and then making a determination based on the relative contribution to an issue. In cases where MSAT emissions would be more substantial than those of this project, a health risk assessment would be conducted.

Impacts Remaining After Mitigation

NEPA Finding

No adverse effects would occur under NEPA.

CEQA Determination

No impacts would occur under CEQA.

4.6.3.2 TSM Alternative

Construction Impacts

Bus service enhancements anticipated to occur under the TSM Alternative would not require construction of a new, or expansion of an existing, MSF, and no substantial physical improvements would be constructed. Consequently, no or very minor amounts of criteria pollutant emissions or toxic air contaminant emissions would be generated. No significant or substantial adverse construction-related impacts under CEQA or NEPA would occur as result of the TSM Alternative.

Operational Impacts

Regional Criteria Pollutant Emissions

Under the TSM Alternative, the existing Metro Division 15 MSF would be used to support the bus service enhancements without major modifications, and therefore, no increase in criteria pollutant emissions from stationay sources would occur.

With respect to mobile-source emissions, operation of the TSM Alternative would involve criteria pollutant emissions from motor vehicles operating in the vicinity of the project. As demonstrated for the 2012 Alternative 3 scenario in Table 4.6-19, there would be net reductions or negligible increases in operational emissions of criteria pollutants relative to the 2012 No Build scenario. Because roadway capacity would be reduced by the greatest amount under Alternative 3 relative to the other build alternatives, Alternative 3 represents a worst-case with respect to traffic flow. By extension, traffic operations under the TSM Alternative would have less delay and more efficient operating speeds than Alternative 3, which would result in lower emissions from motor vehicles operating in the project vicinity. On the basis of the less extensive traffic impacts relative to the 2012 Alternative 3 scenario, net critieria pollutant emissions under the 2012 TSM Alternative scenario would be no more than those identified in Table 4.6-19.

The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. Because no SCAQMD thresholds would be exceeded under the 2012 TSM Alternative scenario and operational emissions are accounted for in the SIP, impacts would be less than significant under CEQA and would not be adverse under NEPA.

As shown in Table 4.6-5, regional criteria pollutant emissions under the 2040 TSM Alternative scenario would not exceed any of the SCAQMD thresholds for criteria pollutants.

Table 4.6-5: TSM Alternative Regional Criteria Pollutant Emissions

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
2040 TSM	60,870	530,155	168,480	62,523	25,606
2040 No-Build	60,862	530,143	168,455	62,523	25,606
Net Project Emissions	8	12	25	(< 1)	< 1
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold	No	No	No	No	No
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Localized Criteria Pollutant Emissions

Traffic redistribution effects anticipated to occur under the TSM Alternative would be negligible. As such, there would be no material change in intersection traffic volumes and peak-hour LOS occurring under the TSM Alternative when compared to the No-Build Alternative. Since localized emissions concentrations are a function of traffic volumes and peak-hour LOS, no meaningful change in localized pollutant concentrations are anticipated to occur under the TSM Alternative when compared to the No-Build Alternative. Impacts, if they occur, would be less than significant under CEQA and would not be adverse under NEPA. No mitigation measures are necessary.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under the TSM Alternative would generate the regional MSAT emissions estimates presented in Table 4.6-6. As shown therein, there would be no material change in regional MSAT pollutant emissions under the TSM Alternative when compared to the No-Build Alternative. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80% in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100%. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Cumulative Impacts

The South Coast Air Basin is the study area for evaluation of cumulative impacts for air quality. SCAQMD has responsibility for managing the Basin's air resources, and is responsible for bringing the Basin into attainment for federal and state air quality standards. Given the TSM Alternative would result in no or negligible increases in pollutant emissions, it would not appreciably contribute to any cumulative air quality impacts (also please see the cumulative impacts discussion for the Alternatives 1 through 4 below).

Table 4.6-6: TSM Alternative MSAT Emissions

Pollutant Name	Daily Emissions (pounds per day)		
	TSM Alternative	No-Build Alternative	Net Emissions
Benzene	1,302	1,302	< 1
Acrolein	39	39	< 1
Acetaldehyde	1,053	1,053	< 1
Formaldehyde	2,380	2,379	< 1
Butadiene	196	196	< 1
Naphthalene	75	75	< 1
POM	38	38	< 1
Diesel PM	497	497	< 1
DEOG	12,358	12,356	2
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Mitigation Measures

Construction Mitigation Measures

No construction mitigation measures are required.

Operational Mitigation Measures

No operational mitigation measures are required.

Impacts Remaining After Mitigation

NEPA Finding

No adverse effects would occur under NEPA.

CEQA Determination

No or less-than-significant impacts would occur under CEQA.

4.6.3.3 BRT Alternatives (Alternatives 1 and 2)

Alternative 1 – Curb-Running BRT

Construction Impacts

Project construction under Alternative 1 would result in the short-term generation of criteria pollutant emissions. Emissions would include: (1) fugitive dust generated from curb/pavement demolition, site work, and other construction activities; (2) hydrocarbon (ROG) emissions related to the application of architectural coatings and asphalt pavement; (3) exhaust emissions from powered construction equipment; and (4) motor vehicle emissions associated with construction equipment, worker commute, and debris-hauling activities.

During construction, the proposed project would be subject to SCAQMD Rule 403 (Fugitive Dust). SCAQMD Rule 403 does not require a permit for construction activities, per se, but rather sets forth requirements for all construction sites (as well as other fugitive dust sources) in the Basin. In general, Rule 403 prohibits a project from causing or allowing emissions of fugitive dust from construction (or other fugitive dust source) to remain visible in the atmosphere beyond the property line of the emissions source.

The total amount of construction, the duration of construction, and the intensity of construction activity would have a substantial effect on the amount of daily construction pollutant emissions, pollutant concentrations, and the resulting impacts occurring at any one time. As such, the emissions forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction would occur in a relatively intensive manner. Because of these conservative assumptions, actual emissions would likely be less than those forecasted. For example, if construction is delayed or occurs over a longer time period, emissions would be reduced because of: (1) a more modern and cleaner burning construction equipment fleet mix, and/or (2) a less intensive build-out schedule (i.e., lower daily emissions occurring over a longer time interval).

For the purposes of this impact analysis, Alternative 1 construction assumes an 18-month construction period. However, it should be noted that work would generally proceed in a linear sequence so most locations would be affected for a shorter period than 18 months. Combustion exhaust and fugitive dust (PM_{10} and $PM_{2.5}$) mass emissions were estimated using the SCAQMD-recommended CalEEMod, version 2013.2.2. Detailed construction equipment use assumptions (quantity and use hours), among other assumptions, are documented in the CalEEMod modeling output sheets provided in the appendix to the Air Quality Technical Report (see Appendix L). Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403. Construction-period emissions anticipated to occur under Alternative 1 are discussed below.

Criteria Pollutant Emissions

The estimate of construction-period regional mass emissions is shown in Table 4.6-7. As shown therein, regional emissions are not expected to exceed the SCAQMD regional emissions thresholds. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Table 4.6-7: Alternative 1 – Estimated Worst-case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Roadway Improvements, Sidewalks/Curbs, and Stations	6	63	49	<1	10	6
Year 2018						
Roadway Improvements, Sidewalks/Curbs, and Stations	39	56	46	<1	10	6
Maximum Daily Emissions	39	63	49	<1	10	6
Regional Construction Threshold	75	100	550	150	150	55
Exceed Thresholds?	No	No	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

With respect to local impacts, SCAQMD has developed a set of local mass emission thresholds to evaluate localized impacts. According to SCAQMD, only those emissions that occur on site are to be considered in the localized significance threshold (LST) analysis. Consistent with SCAQMD LST evaluation guidelines, emissions related to haul truck and employee commuting activity during construction are not considered in the evaluation of localized impacts. As shown in Table 4.6-8, localized PM10 and PM2.5 emissions during construction would exceed local thresholds. As such, short-term local mass emissions would be significant under CEQA and adverse under NEPA prior to implementation of mitigation measures.

Table 4.6-8: Alternative 1 – Estimated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Phase	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Median Improvements, Sidewalks/Curbs, and Stations	63	49	10	6
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	No	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

Toxic Air Contaminant Emissions

With respect to construction-period impacts, the greatest potential for TAC emissions would be related to DPM emissions associated with heavy equipment operations during project construction. Construction activities associated with the project would be sporadic, transitory, and short term in nature. The assessment of cancer risk is typically based on a 70-year exposure period; however, Alternative 1 construction is anticipated to have a duration of approximately 18 months. Because exposure to diesel exhaust would be well below the 70-year exposure period, project construction is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, project-related toxic emission impacts during construction would be less than significant under CEQA and would not be adverse under NEPA.

Operational Impacts

Regional Criteria Pollutant Emissions

Under Alternative 1, the existing Metro Division 15 MSF would be used to support the bus service enhancements without major modifications, and therefore, no increase in criteria pollutant emissions from stationary sources would occur.

With respect to mobile-source emissions, operation of Alternative 1 would involve criteria pollutant emissions from motor vehicles operating in the vicinity of the project. As demonstrated for the 2012 Alternative 3 scenario in Table 4.6-19, there would be net reductions or negligible increases in operational emissions of criteria pollutants relative to the 2012 No Build scenario. Because roadway capacity would be reduced by the greatest amount under Alternative 3 relative to the other build

alternatives, Alternative 3 represents a worst-case with respect to traffic flow. By extension, traffic operations under Alternative 1 would have less delay and more efficient operating speeds than Alternative 3, which would result in lower emissions from motor vehicles operating in the project vicinity. On the basis of the less extensive traffic impacts relative to the 2012 Alternative 3 scenario, net criteria pollutant emissions under the 2012 Alternative 1 scenario would be no more than those identified in Table 4.6-19.

The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. Because no SCAQMD thresholds would be exceeded under the 2012 Alternative 1 scenario and operational emissions are accounted for in the SIP, impacts would be less than significant under CEQA and would not be adverse under NEPA.

As shown in Table 4.6-9, regional criteria pollutant emissions under the 2040 Alternative 1 scenario would exceed the SCAQMD threshold for NO_X, but would not exceed the thresholds for any other pollutant. Such increases would occur as a result of changes in auto circulation patterns and speeds.

Table 4.6-9: Alternative 1 – Regional Criteria Pollutant Emissions

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
2040 Alternative 1	60,912	530,156	168,528	62,519	25,604
2040 No Build	60,862	530,143	168,455	62,523	25,606
Net Project Emissions	49	12	73	(4)	(1)
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold	No	No	Yes	No	No
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Carbon Monoxide Hot-Spot Analysis

Based on ambient air monitoring data collected by SCAQMD, the Basin has continually met state and federal ambient air quality standards for CO since 2003. As such, the Basin was reclassified to attainment/maintenance status from serious nonattainment, effective June 11, 2007. While the *Final 2016 Air Quality Management Plan* (AQMP) is the most recent AQMP, no additional regional or hot-spot CO modeling has been conducted to demonstrate attainment of the 8-hour average CO standard since the analysis provided in the 2003 AQMP.

Since local CO concentrations are a function of: 1) intersection traffic volumes, 2) peak-hour intersection LOS, 3) CO emissions factors [idle and grams/mile], and 4) the ambient CO background concentration; it is possible to identify which, if any, of the most congested intersection locations anticipated to exist under Alternative 1 have a potential to violate state or federal CO standards. The Alternative 1 intersections included in the Air Quality Technical Report in Appendix L meet the following criteria: 1) intersection LOS and/or delay would worsen under Alternative 1 when compared to the No-Build Alternative, and 2) the intersection would operate at LOS F.

Total intersection approach volumes under Alternative 1 would not exceed the maximum total intersection approach volume identified for a 2003 attainment demonstration intersection, during the AM or PM peak-hour period. In addition, the eastern San Fernando Valley is predicted to have an 8-hour CO background concentration of 5.5 ppm at year 2020 (farthest SCAQMD prediction), compared to an 8-hour background concentration of 7.8 ppm used for the 2003 attainment demonstration analysis. And finally, the CO idle and 5-mph emissions factors for year 2035 (farthest year emissions factors available) are predicted to be 8.7 grams/hour and 1.5 grams/mile, respectively. This compares to CO idle and 5-mph emissions factors of 341.4 grams/hour and 13.9 grams/mile, respectively, used for the 2003 AQMP attainment demonstration.

To summarize: 1) maximum intersection approach volumes under Alternative 1 would be less than the maximum intersection approach volume used for the 2003 AQMP attainment demonstration, 2) idle emissions would be considerably less (97% reduction) than those used for the 2003 AQMP attainment demonstration, and 3) grams/mile emissions would be considerably less (89% reduction) than those used for the 2003 AQMP attainment demonstration. As such, there would be no potential for Alternative 1 CO emissions at any intersection location to result in an exceedance of either the NAAQS or CAAQS for CO. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Particulate Matter Hot-Spot Analysis

The EPA has specified a quantitative method for analyzing localized $PM_{2.5}$ or PM_{10} concentrations from operational traffic titled, *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* in November 2015. EPA specifies in 40 CFR 93.123(b)(1) that only "projects of air quality concern" are required to undergo a $PM_{2.5}$ and PM_{10} hot-spot analysis. EPA defines projects of air quality concern as certain highway and transit projects that involve significant levels of diesel traffic or any other project that is identified by the $PM_{2.5}$ SIP as a localized air quality concern. A discussion of Alternative 1 compared to projects of air quality concern, as defined by 40 CFR 93.123(b)(1), is provided below:

New or expanded highway projects that have a significant number of or significant increase in diesel vehicles. Alternative 1 proposes to add curb-running BRT service along selected roadway corridors in the eastern San Fernando Valley. While the proposed improvements would have some effect on local traffic volumes, the effect on the number of diesel-powered vehicles that use the affected roadway facility or any adjacent facilities would be negligible.

Projects affecting intersections that are at 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. Alternative 1 is proposing to add curb-running BRT service along selected roadway corridors in the eastern San Fernando Valley. The primary project objective is to improve both existing and future mobility, and reduce congestion. Alternative 1 would have no effect on diesel truck traffic volumes.

New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location. Alternative 1 would not use any diesel-powered vehicles. In addition, the Metro bus fleet contains no diesel-powered buses, and Metro does not intend to acquire any diesel-powered buses. No diesel-powered transit buses would be used to provide service to any bus or rail terminal.

Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location. Alternative 1 would not expand any bus terminal, rail terminal, or related transfer point that would increase the number of diesel vehicles congregating at any single location.

Projects in or affecting locations, areas, or categories of sites that are identified in the PM2.5- or PM10-applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation. The project vicinity is not in or affecting an area or location identified in any PM_{10} or $PM_{2.5}$ implementation plan. The immediate project area is not considered to be a site of violation or possible violation.

The discussion provided above indicates that Alternative 1 would not be considered a project of air quality concern, as defined by 40 CFR 93.123(b)(1). Alternative 1 would not generate new air quality violations, worsen existing violations, or delay attainment of national AAQS for $PM_{2.5}$ and PM_{10}. Potential impacts would be less than significant under CEQA and would not be adverse under NEPA.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under Alternative 1 would generate the regional MSAT emissions estimates presented in Table 4.6-10, below. As shown in the table, there would be no material change in regional MSAT pollutant emissions under Alternative 1 when compared to the No-Build Alternative. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80% in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100%. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Table 4.6-10: Alternative 1 – MSAT Emissions

Pollutant Name	Daily Emissions (pounds per day)		
	Alternative 1	No-Build Alternative	Net Emissions
Benzene	1,303	1,302	1
Acrolein	39	39	< 1
Acetaldehyde	1,053	1,053	< 1
Formaldehyde	2,380	2,379	1
Butadiene	196	196	< 1
Naphthalene	75	75	< 1
POM	38	38	< 1
Diesel PM	497	497	(< 1)
DEOG	12,359	12,356	3
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Cumulative Impacts

California is divided geographically into 15 air basins for the purpose of managing the air resources of the state on a regional basis. Each air basin generally has similar meteorological and geographic conditions throughout. Local districts are responsible for preparing the portion of the SIP applicable within their boundaries.

The proposed project is located in the South Coast Air Basin; and as such, the Basin is the appropriate study area for evaluation of cumulative impacts for air quality. The South Coast Air Quality Management District (SCAQMD) has responsibility for managing the Basin's air resources, and is responsible for bringing the Basin into attainment for federal and state air quality standards. To achieve this goal, the SCAQMD prepares/updates the Basin's AQMP every 4 years.

The "on-road emissions" AQMP budgets are developed based on the regional transportation planning documents that are prepared by SCAG. The proposed project is included in the SCAG 2016-2040 RTP/SCS under Project ID 1TR0706 (for the BRT Alternatives) and ID S1160326 (for all build alternatives). The proposed project has been incorporated into amendment 17-02 to the SCAG 2017 FTIP under project ID LA0G1301. The 2016-2040 RTP/SCS was found by FHWA and FTA to be in conformity with the SIP on June 1, 2016. The 2017 FTIP amendment, in which the project is listed, was found to be in conformity on February 21, 2017 (see Appendix A).

Per State CEQA Guidelines Section 15130 (d), where a project is included in an approved regional transportation plan (among other land use plans) that adequately address the effected resource area, no additional analysis is required. Because the proposed project is listed, as currently proposed, in the region's currently conforming SCAG 2016-2040 RTP/SCS and 2017 FTIP regional transportation planning documents, project emissions would not be cumulatively considerable.

Compliance Requirements and Design Features

The project would comply with all applicable SCAQMD Rules, which include Rule 403 (fugitive dust), Rule 431.2 (sulfur content of liquid fuels) and Rule 1113 (architectural coatings), among other rules.

Mitigation Measures

Construction Mitigation Measures

The following measures are prescribed and shall be implemented to reduce short-term construction emissions that exceed SCAQMD significance thresholds:

MM-AQ-1 (All Build Alternatives): Construction vehicle and equipment trips and use shall be minimized to the extent feasible and unnecessary idling of heavy equipment shall be avoided.

MM-AQ-2 (All Build Alternatives): Solar powered, instead of diesel powered, changeable message signs shall be used.

MM-AQ-3 (All Build Alternatives): Electricity from power poles, rather than from generators, shall be used where feasible.

MM-AQ-4 (All Build Alternatives): Engines shall be maintained and tuned per manufacturer's specifications to perform at EPA certification levels and to perform at verified standards applicable to retrofit technologies. Periodic, unscheduled inspections shall be conducted to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.

MM-AQ-5 (All Build Alternatives): Any tampering with engines shall be prohibited and continuing adherence to manufacturer's recommendations shall be required.

MM-AQ-6 (All Build Alternatives): New, clean (diesel or retrofitted diesel) equipment meeting the most stringent applicable federal or state standards shall be used and the best available emissions control technology shall be employed. Tier 4 engines shall be used for all construction equipment. If non-road construction equipment that meets Tier 4 engine standards is not available, the Construction Contractor shall be required to use the best available emissions control technologies on all equipment.

MM-AQ-7 (All Build Alternatives): EPA-registered particulate traps and other appropriate controls shall be used where suitable to reduce emissions of diesel particulate matter (PM) and other pollutants at the construction site.

Operational Mitigation Measures

All impacts would be less than significant under CEQA and not adverse under NEPA. No mitigation measures are necessary.

Impacts Remaining After Mitigation

With the implementation of the mitigation measures identified above, construction emissions under Alternative 1 would be reduced, but would exceed the LSTs for PM_{10} and $PM_{2.5}$, as shown in Table 4.6-11. Based on the reduction of emissions, effects under NEPA would not be adverse. However, based on the emissions of PM_{10} and $PM_{2.5}$ exceeding the LSTs, impacts would remain significant under CEQA after the implementation of proposed mitigation measures.

Table 4.6-11: Alternative 1 – Estimated Mitigated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Median Improvements, Sidewalks/Curbs, and Stations	14	31	8	4
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	No	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

NEPA Finding

Construction effects would not be adverse under NEPA after the implementation of mitigation measures. Operational effects would not be adverse under NEPA.

CEQA Determination

Construction of Alternative 1 would not result in the emission of criteria pollutants in excess of regional thresholds, but emissions would be higher than SCAQMD LSTs for PM_{10} and $PM_{2.5}$. Therefore, construction impacts under Alternative 1 would be significant under CEQA after the implementation of proposed mitigation measures.

The operation of Alternative 1 would result in a decrease, or a minor increase, in the emissions of criteria pollutants, and would have no or minimal effects on the emission of MSAT pollutants. In addition, no localized operational impacts related to hot-spots for CO or particulate matter were identified. Operational impacts under Alternative 1 would be less than significant under CEQA.

Alternative 2 – Median-Running BRT

Construction Impacts

Project construction under Alternative 2 would result in the short-term generation of criteria pollutant emissions, similar to those described for Alternative 1. During construction of Alternative 2, the proposed project would be subject to SCAQMD Rule 403 (Fugitive Dust), which does not require a permit for construction activities, per se, but rather sets forth requirements for all construction sites (as well as other fugitive dust sources) in the Basin.

For the purpose of this impact analysis, Alternative 2 construction assumes a 24-month construction-period duration. However, it should be noted that work would generally proceed in a linear sequence so most locations would be affected for a shorter period than 24 months. Combustion exhaust and fugitive dust (PM_{10} and $PM_{2.5}$) mass emissions were estimated using the SCAQMD-recommended CalEEMod, version 2013.2.2 as described for Alternative 1. Construction-period emissions anticipated to occur under Alternative 2 are discussed below.

Criteria Pollutant Emissions

The estimate of construction-period regional mass emissions is shown in Table 4.6-12. As shown in the table, regional emissions are not expected to exceed the SCAQMD regional emissions thresholds. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

With respect to local impacts, SCAQMD has developed a set of local mass emission thresholds to evaluate localized impacts. According to SCAQMD, only those emissions that occur on-site are to be considered in the LST analysis. Consistent with SCAQMD LST evaluation guidelines, emissions related to haul truck and employee commuting activity during construction are not considered in the evaluation of localized impacts. As shown in Table 4.6-13, localized PM_{10} and $PM_{2.5}$ emissions during construction would exceed local thresholds. As such, short-term local mass emissions would be significant under CEQA and adverse under NEPA prior to implementation of mitigation measures.

Table 4.6-12: Alternative 2 – Estimated Worst-case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Median Improvements, Sidewalks/Curbs, and Stations	6	73	56	<1	11	7
Year 2018						
Median Improvements, Sidewalks/Curbs, and Stations	6	66	53	<1	10	6
Year 2019						
Median Improvements, Sidewalks/Curbs, and Stations	34	15	19	<1	2	1
Maximum Daily Emissions	34	73	56	<1	11	6
Regional Construction Threshold	75	100	550	150	150	55
Exceed Thresholds?	No	No	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

Table 4.6-13: Alternative 2 – Estimated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Median Improvements, Sidewalks/Curbs, and Stations	73	56	11	7
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	No	No	Yes	Yes
[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries. [b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre). Source: CalEEMod emissions modeling by ICF International 2015.				

Toxic Air Contaminant Emissions

With respect to construction-period impacts, the greatest potential for TAC emissions would be related to DPM emissions associated with operation of heavy construction equipment. Construction activities associated with the project would be sporadic, transitory, and short term in nature. The assessment of cancer risk is typically based on a 70-year exposure period; however, Alternative 2 construction is anticipated to have a duration of approximately two years. Because exposure to diesel exhaust would be well below the 70-year exposure period, project construction is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, project-related toxic emission impacts during construction would be less than significant under CEQA and would not be adverse under NEPA.

Operational Impacts

Regional Criteria Pollutant Emissions

Under Alternative 2, the existing Metro Division 15 MSF would be used to support bus service enhancements without major modifications, and therefore, no increase in criteria pollutant emissions from stationay sources would occur.

With respect to mobile-source emissions, operation of Alternative 2 would involve criteria pollutant emissions from motor vehicles operating in the vicinity of the project. As demonstrated for the 2012 Alternative 3 scenario in Table 4.6-19, there would be net reductions or negligible increases in operational emissions of criteria pollutants relative to the 2012 No Build scenario. Because roadway capacity would be reduced by the greatest amount under Alternative 3 relative to the other build alternatives, Alternative 3 represents a worst-case with respect to traffic flow. By extension, traffic operations under Alternative 2 would have less delay and more efficient operating speeds than Alternative 3, which would result in lower emissions from motor vehicles operating in the project vicinity. On the basis of the less extensive traffic impacts relative to the 2012 Alternative 3 scenario, net criteria pollutant emissions under the 2012 Alternative 2 scenario would be no more than those identified in Table 4.6-19.

The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. Because no SCAQMD thresholds would be exceeded under the 2012 Alternative 2 scenario and operational emissions are accounted for in the SIP, impacts would be less than significant under CEQA and would not be adverse under NEPA.

As shown in Table 4.6-14, regional criteria pollutant emissions under the 2040 Alternative 2 scenario would exceed the SCAQMD threshold for NO_X, but would not exceed the thresholds for any other pollutant. Such increases would occur as a result of changes in auto circulation patterns and speeds.

Table 4.6-14: Alternative 2 – Regional Criteria Pollutant Emissions

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
2040 Alternative 2	60,874	530,144	168,527	62,518	25,604
2040 No Build	60,862	530,143	168,455	62,523	25,606
Net Project Emissions	11	1	71	(4)	(2)
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold	No	No	Yes	No	No
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Carbon Monoxide Hot-Spot Analysis

As discussed under the CO hot-spot analysis for Alternative 1 above, the Basin has continually met the state and federal ambient air quality standards for CO since 2003. Since high-volume, congested intersections are primary determinants of CO impacts, intersections projected to experience the most congested conditions under Alternative 2 were identified.

As discussed in the Air Quality Technical Report in Appendix L, total intersection approach volumes under Alternative 2 would not exceed the maximum total intersection approach volume identified for a 2003 attainment demonstration intersection, during the AM or PM peak-hour period. In addition, as discussed in the CO hot-spot analysis for Alternative 1 above, the eastern San Fernando Valley is predicted to have lower future background CO concentrations and idle and 5-mph emission factors would be lower than those used for the 2003 AQMP attainment demonstration.

Based on Alternative 2's lower intersection approach volumes, idle emissions, and grams/mile emissions relative to the 2003 AQMP attainment demonstration, there would be no potential for Alternative 2 CO emissions at any intersection location to result in an exceedance of either the NAAQS or CAAQS for CO. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Particulate Matter Hot-Spot Analysis

For the same reasons identified in the particulate matter hot-spot analysis for Alternative 1 above, Alternative 2 would not be considered a project of air quality concern, as defined by 40 CFR 93.123(b)(1). Alternative 2 would not generate new air quality violations, worsen existing violations, or delay attainment of national AAQS for $PM_{2.5}$ and PM_{10}. Potential impacts would be less than significant under CEQA and would not be adverse under NEPA.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under Alternative 2 would generate the regional MSAT emissions estimates presented in Table 4.6-15, below. As shown in the table, there would be no material change in regional MSAT pollutant emissions under Alternative 2 when compared to the No-Build Alternative. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80% in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100%. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Cumulative Impacts

Cumulative impacts would be the same as the cumulative impacts described above for Alternative 1.

Compliance Requirements and Design Features

Compliance requirements and design features included under Alternative 1 would also be included under Alternative 2.

Mitigation Measures

Construction Mitigation Measures

Mitigation measures MM-AQ-1 through MM-AQ-7 described under Alternative 1 would be implemented to mitigate impacts under Alternative 2.

Table 4.6-15: Alternative 2 – MSAT Emissions

Pollutant Name	Daily Emissions (pounds per day)		
	Alternative 2	No-Build Alternative	Net Emissions
Benzene	1,303	1,302	< 1
Acrolein	39	39	< 1
Acetaldehyde	1,053	1,053	< 1
Formaldehyde	2,380	2,379	1
Butadiene	196	196	< 1
Naphthalene	75	75	< 1
POM	38	38	< 1
Diesel PM	497	497	(< 1)
DEOG	12,359	12,356	3
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Operational Mitigation Measures

No mitigation measures are necessary.

Impacts Remaining After Mitigation

With the implementation of proposed mitigation measures MM-AQ-1 through MM-AQ-7, construction emissions under Alternative 2 would be reduced, but would exceed the LSTs for PM_{10} and $PM_{2.5}$, as shown in Table 4.6-16. Based on the reduction of emissions with implementation of mitigation, effects under NEPA would not be adverse. However, based on the emissions of PM_{10} and $PM_{2.5}$ exceeding the LSTs, impacts would remain significant under CEQA after the implementation of proposed mitigation measures.

Table 4.6-16: Alternative 2 – Estimated Mitigated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Median Improvements, Sidewalks/Curbs, and Stations	24	38	9	5
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	No	No	Yes	Yes
[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries. [b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre). Source: CalEEMod emissions modeling by ICF International 2015.				

NEPA Finding

Construction effects would not be adverse under NEPA after implementation of proposed mitigation measures. Operational effects would not be adverse under NEPA.

CEQA Determination

Construction of Alternative 2 would not result in the emission of criteria pollutants in excess of regional thresholds, but emissions would be higher than SCAQMD LSTs for PM_{10} and $PM_{2.5}$. Therefore, construction impacts under Alternative 2 would be significant under CEQA after the implementation of proposed mitigation measures.

The operation of Alternative 2 would result in a decrease, or a minor increase, in the emissions of criteria pollutants, and would have no or minimal effects on the emission of MSAT pollutants. In addition, no localized operational impacts related to hot-spots for CO or particulate matter were identified. Operational impacts under Alternative 2 would be less than significant under CEQA.

4.6.3.4 Rail Alternatives (Alternatives 3 and 4)

Alternative 3 – Low-Floor LRT/Tram

Construction Impacts

Construction of Alternative 3 would result in the short-term generation of criteria pollutant emissions, as described for Alternative 1 above. During construction of Alternative 3, the proposed project would be subject to SCAQMD Rule 403 (Fugitive Dust), which does not require a permit for construction activities, per se, but rather sets forth requirements for all construction sites (as well as other fugitive dust sources) in the Basin.

For the purpose of this impact analysis, Alternative 3 construction assumes a 24-month construction-period duration. However, it should be noted that work would generally proceed in a linear sequence along the project corridors so most locations would be affected by construction for a shorter period than 24 months. Combustion exhaust and fugitive dust (PM_{10} and $PM_{2.5}$) mass emissions were estimated using the SCAQMD-recommended CalEEMod, version 2013.2.2. Detailed construction equipment use assumptions (quantity and use hours), among other assumptions, are documented in the CalEEMod modeling output sheets provided in the appendix to this Air Quality Report. Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403. Construction-period emissions anticipated to occur under Alternative 3 are discussed below.

Criteria Pollutant Emissions

The estimate of construction-period regional mass emissions is shown in Table 4.6-17. As shown in the table, regional emissions for ROG and NOx are expected to exceed the SCAQMD regional emissions thresholds. Impacts would be significant under CEQA and adverse under NEPA prior to implementation of mitigation measures.

Table 4.6-17: Alternative 3 – Estimated Worst-case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Maintenance Facility	6	67	53	<1	11	14
Track Installation, Sidewalks/Curbs, and Stations	8	91	70	<1	13	8
Pedestrian Bridge and TPSS Facilities	3	20	16	<1	1	1
Concurrent Year 2017 Emissions	17	178	139	<1	25	22
Year 2018						
Maintenance Facility	81	24	20	<1	2	2
Track Installation, Sidewalks/Curbs, and Stations	7	82	66	<1	12	7
Pedestrian Bridge and TPSS Facilities	3	18	16	<1	1	1
Concurrent Year 2018 Emissions	91	124	102	<1	15	10
Year 2019						
Maintenance Facility **(Complete)**	—	—	—	—	—	—
Track Installation, Sidewalks/Curbs, and Stations	36	18	34	<1	2	1
Pedestrian Bridge and TPSS Facilities **(Complete)**	—	—	—	—	—	—
Concurrent Year 2019 Emissions	36	18	34	<1	2	1
Maximum Daily Emissions	91	178	139	<1	25	22
Regional Construction Threshold	75	100	550	150	150	55
Exceed Thresholds?	Yes	Yes	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

With respect to local impacts, SCAQMD has developed a set of local mass emission thresholds to evaluate localized impacts. According to SCAQMD, only those emissions that occur on site are to be considered in the LST analysis. Consistent with SCAQMD LST evaluation guidelines, emissions related to haul truck and employee commuting activity during construction are not considered in the evaluation of localized impacts. As shown in Table 4.6-18, localized PM_{10} and $PM_{2.5}$ emissions during construction would exceed local thresholds. As such, short-term local mass emissions would be significant under CEQA and adverse under NEPA prior to implementation of mitigation measures.

Table 4.6-18: Alternative 3 – Estimated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Maintenance Facility	67	53	11	14
Track Installation, Sidewalks/Curbs, and Stations	91	70	13	8
Pedestrian Bridge and TPSS Facilities	20	16	1	1
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	Yes	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

Toxic Air Contaminant Emissions

With respect to construction-period impacts, the greatest potential for TAC emissions would be related to DPM emissions associated with operation of heavy construction equipment. Construction activities associated with the project would be sporadic, transitory, and short term in nature. The assessment of cancer risk is typically based on a 70-year exposure period; however, Alternative 3 construction is anticipated to have a duration of approximately two years. Because exposure to diesel exhaust would be well below the 70-year exposure period, project construction is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, project-related toxic emission impacts during construction would be less than significant under CEQA and would not be adverse under NEPA.

Operational Impacts

Regional Criteria Pollutant Emissions

Operation of Alternative 3 would involve criteria pollutant emissions from the new MSF, transit vehicle propulsion, and from motor vehicles operating in the vicinity of the project, as shown for the 2012 Alternative 3 scenario in Table 4.6-19. Most of the emissions related to the maintanence facility and transit vehicle propulsion would occur outside the Basin, as much of the electricity consumed in the region is produced elsewhere.

Emissions from motor vehicles operating in the project vicinity, however, would occur entirely within the Basin. As shown in Table 4.6-19, compared to 2012 No Build scenario, the 2012 Alternative 3 scenario would result in a net decrease in emissions of ROG, CO, and NO_X, and negligible increases in PM10 and PM2.5 emissions, and no SCAQMD thresholds would be exceeded. The proposed project's requirement to demonstrate transportation conformity ensures that project emissions are accounted for in the SIP, which demonstrated attainment of the federal ozone standard. Because no SCAQMD thresholds would be exceeded under the 2012 Alternative 3 scenario and operational emissions are accounted for in the SIP, impacts would be less than significant under CEQA and would not be adverse under NEPA.

Table 4.6-19: Alternative 3 – Regional Criteria Pollutant Emissions (2012)

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Maintenance Facility	2	< 1	< 1	< 1	< 1
Transit Vehicle Propulsion	1	7	8	1	1
Traffic Emissions					
2012 Alternative 3	187,173	2,223,028	707,736	63,338	33,706
2012 No-Build	187,182	2,223,083	707,749	63,339	33,706
2012 Net Project Emissions	(9)	(55)	(13)	(1)	(< 1)
Net Project Emissions	**(6)**	**(48)**	**(4)**	**< 1**	**< 1**
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold	No	No	No	No	No
Source: ICF, 2016; calculated using CalEEMod and 2014 Metro Rail energy data.					

As shown in Table 4.6-20, ROG and NOx emissions are anticipated to exceed the SCAQMD thresholds under the 2040 Alternative 3 scenario due to changes in automobile circulation patterns and speeds. All other criteria pollutant emissions under the 2040 Alternative 3 scenario would not exceed SCAQMD thresholds.

Table 4.6-20: Alternative 3 – Regional Criteria Pollutant Emissions (2040)

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Maintenance Facility	2	< 1	< 1	< 1	< 1
Transit Vehicle Propulsion	1	7	8	1	1
Traffic Emissions					
2040 Alternative 3	61,008	530,592	168,966	62,524	25,607
2040 No-Build	60,862	530,143	168,455	62,523	25,606
2040 Net Project Emissions	**148**	**456**	**519**	**2**	**2**
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold (2040)	Yes	No	Yes	No	No
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Carbon Monoxide Hot-Spot Analysis

As discussed under the CO hot-spot analysis for Alternative 1 above, the Basin has continually met the state and federal ambient air quality standards for CO since 2003. Since high-volume, congested intersections are primary determinants of CO impacts, intersections projected to experience the most congested conditions under Alternative 3 in 2012 and 2040 were identified.

As discussed in the Air Quality Technical Report (see Appendix L), total intersection approach volumes under Alternative 3 for both 2012 and 2040 would not exceed the maximum total intersection approach volume identified for a 2003 attainment demonstration intersection during the AM or PM peak-hour period. As discussed in the CO hot-spot analysis for Alternative 1, the eastern San Fernando Valley is predicted to have lower future background CO concentrations and idle and 5 mph emission factors would be lower than those used for the 2003 AQMP attainment demonstration.

Based on Alternative 3's lower intersection approach volumes, idle emissions, and grams/mile emissions relative to the 2003 AQMP attainment demonstration, there would be no potential for Alternative 3 CO emissions at any intersection to result in an exceedance of either the NAAQS or CAAQS for CO. Impacts would be less than significant under CEQA and not adverse under NEPA.

Particulate Matter Hot-Spot Analysis

For the same reasons identified in the particulate matter hot-spot analysis for Alternative 1 above, Alternative 3 would not be considered a project of air quality concern, as defined by 40 CFR 93.123(b)(1). Alternative 3 would not generate new air quality violations, worsen existing violations, or delay attainment of national AAQS for $PM_{2.5}$ and PM_{10}. Potential impacts would be less than significant under CEQA and would not be adverse under NEPA.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under Alternative 3 would generate the regional MSAT emissions estimates presented in Table 4.6-21 for the 2012 Alternative 3 scenario and in Table 4.6-22 for the 2040 Alternative 3 scenario. As shown in the tables, there would be reductions in MSAT emissions in the 2012 scenario and no material change in regional MSAT pollutant emissions under the 2040 Alternative 3 scenario when compared to the corresponding No-Build Alternative scenarios. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80% in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100%. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Cumulative Impacts

Cumulative impacts would be the same as the cumulative impacts described for Alternative 1 and emissions would not be cumulatively considerable.

Compliance Requirements and Design Features

Compliance requirements and design features included under Alternative 1 would also be included under Alternative 3.

Mitigation Measures

Construction Mitigation Measures

Mitigation measures MM-AQ-1 through MM-AQ-7 described under Alternative 1 would also mitigate construction-period impacts under Alternative 3.

Table 4.6-21: Alternative 3 – MSAT Emissions (2012)

Pollutant Name	Daily Emissions (pounds per day)		
	Alternative 3	No-Build Alternative	Net Emissions
Benzene	4,326	4,326	(< 1)
Acrolein	146	146	(< 1)
Acetaldehyde	3,238	3,238	(< 1)
Formaldehyde	7,503	7,503	(< 1)
Butadiene	714	714	(< 1)
Naphthalene	220	220	(< 1)
POM	183	183	(< 1)
Diesel PM	12,973	12,973	(< 1)
DEOG	36,944	36,946	(2)
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Table 4.6-22: Alternative 3 – MSAT Emissions (2040)

Pollutant Name	Daily Emissions (pounds per day)		
	Alternative 3	No-Build Alternative	Net Emissions
Benzene	1,305	1,302	3
Acrolein	40	39	0
Acetaldehyde	1,056	1,053	3
Formaldehyde	2,385	2,379	6
Butadiene	197	196	< 1
Naphthalene	75	75	< 1
POM	38	38	< 1
Diesel PM	497	497	< 1
DEOG	12,389	12,356	33
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Operational Mitigation Measures

No mitigation measures are necessary.

Impacts Remaining After Mitigation

Without the implementation of proposed mitigation measures, construction-period emissions for ROG and NO_x were forecasted to exceed the SCAQMD regional emissions thresholds under Alternative 3. As shown in Table 4.6-23, with the implementation of proposed mitigation measures MM-AQ-1 through MM-AQ-7, NO_x emissions would be reduced to below regional thresholds. ROG emissions, however, would exceed regional emissions thresholds. Although emissions would be reduced, regional effects under NEPA would be adverse after mitigation due to the exceedance of the NO_x regional threshold. Regional impacts would remain significant under CEQA after the implementation of proposed mitigation measures.

Table 4.6-23: Alternative 3 – Estimated Mitigated Worst-Case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Maintenance Facility	2	27	43	<1	10	4
Track Installation, Sidewalks/Curbs, and Stations	3	41	51	<1	11	5
Pedestrian Bridge and TPSS Facilities	<1	4	15	<1	<1	<1
Concurrent Year 2017 Emissions	6	72	109	<1	21	9
Year 2018						
Maintenance Facility	81	3	20	<1	<1	<1
Track Installation, Sidewalks/Curbs, and Stations	3	39	51	<1	10	5
Pedestrian Bridge and TPSS Facilities	<1	4	15	<1	<1	<1
Concurrent Year 2018 Emissions	85	46	86	<1	11	5
Year 2019						
Maintenance Facility **(Complete)**	—	—	—	—	—	—
Track Installation, Sidewalks/Curbs, and Stations	35	3	37	<1	2	1
Pedestrian Bridge and TPSS Facilities **(Complete)**	—	—	—	—	—	—
Concurrent Year 2019 Emissions	35	3	37	<1	2	1
Maximum Daily Emissions	85	72	109	<1	21	9
Regional Construction Threshold	75	100	550	150	150	55
Exceed Thresholds?	Yes	No	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

With the implementation of mitigation measures MM-AQ-1 through MM-AQ-7, construction emissions under Alternative 3 would be reduced, but would exceed the LSTs for ROG, PM_{10} and $PM_{2.5}$, as shown in Table 4.6-24. Based on the reduction of emissions, effects under NEPA would not be adverse. However, based on the emissions of ROG, PM_{10}, and $PM_{2.5}$ exceeding the LSTs, localized impacts would remain significant under CEQA after the implementation of proposed mitigation measures.

NEPA Finding

Construction effects would be adverse under NEPA after the implementation of mitigation measures. Operational effects would not be adverse under NEPA.

CEQA Determination

Construction impacts under Alternative 3 would be significant under CEQA after the implementation of mitigation measures. Operational impacts under Alternative 3 would be less than significant under CEQA.

Table 4.6-24: Alternative 3 – Estimated Mitigated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Maintenance Facility	67	53	11	14
Track Installation, Sidewalks/Curbs, and Stations	91	70	13	8
Pedestrian Bridge and TPSS Facilities	20	16	1	1
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	Yes	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

Alternative 4 – LRT

Construction Impacts

Construction of Alternative 4 would result in the short-term generation of criteria pollutant emissions, as described for Alternative 1. During construction of Alternative 4, the proposed project would be subject to SCAQMD Rule 403 (Fugitive Dust), which does not require a permit for construction activities, per se, but rather sets forth requirements for all construction sites (as well as other fugitive dust sources) in the Basin.

For the purpose of this impact analysis, Alternative 4 construction assumes a 30-month construction-period duration. Work would generally proceed in a linear sequence along the project corridors so most locations would be affected for a shorter period than 30 months. However, extensive work would occur at underground station locations. Combustion exhaust and fugitive dust (PM_{10} and $PM_{2.5}$) mass emissions were estimated using the SCAQMD-recommended CalEEMod, version 2013.2.2. Detailed construction equipment use assumptions (quantity and use hours), among other assumptions, are documented in the CalEEMod modeling output sheets provided in the appendix to this Air Quality Report provided as Appendix L. Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403. Both cut-and-cover and tunnel boring construction methods are included in the analysis below. Construction-period emissions anticipated to occur under Alternative 4 are discussed below.

Criteria Pollutant Emissions

The estimate of construction-period regional mass emissions is shown in Table 4.6-25. As shown in the table, regional emissions for ROG and NOx are expected to exceed the SCAQMD regional emissions thresholds under the cut-and-cover and tunnel boring options. Impacts would be significant under CEQA and adverse under NEPA prior to implementation of mitigation measures.

Table 4.6-25: Alternative 4 – Estimated Worst-case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Maintenance Facility	6	67	53	<1	14	8
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	8	101	77	<1	16	8
Bridges and TPSS Facilities	3	20	16	<1	1	1
Underground Stations and Tunnel (Cut-and-Cover)	24	307	232	1	33	16
Underground Stations and Tunnel (Bore)	11	118	91	0	17	10
Concurrent Year 2017 Emissions – cut and cover	41	495	378	1	64	33
Concurrent Year 2017 Emissions – tunnel boring	28	306	237	<1	48	27
Year 2018						
Maintenance Facility	81	24	20	<1	2	1
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	8	92	73	<1	15	8
Bridges and TPSS Facilities	3	18	16	<1	1	1
Underground Stations and Tunnel (Cut-and-Cover)	23	281	224	1	28	14
Underground Stations and Tunnel (Bore)	10	107	86	0	16	10
Concurrent Year 2018 Emissions – cut and cover	115	415	333	1	46	24
Concurrent Year 2018 Emissions – tunnel boring	102	241	195	<1	34	20
Year 2019						
Maintenance Facility **(Complete)**	—	—	—	—	—	—
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	30	15	21	<1	3	1
Bridges and TPSS Facilities **(Complete)**	—	—	—	—	—	—
Underground Stations and Tunnel (Cut-and-Cover)	5	38	36	<1	3	1
Underground Stations and Tunnel (Bore)	5	38	36	<1	2	1
Concurrent Year 2019 Emissions – cut and cover	35	53	57	<1	4	2
Concurrent Year 2019 Emissions – tunnel boring	35	53	57	<1	4	2
Maximum Daily Emissions – cut and cover	112	462	353	<1	49	29
Maximum Daily Emissions – tunnel boring	102	302	234	<1	38	20
Regional Construction Threshold	75	100	550	150	150	55
Exceed Threshold (cut and cover)?	Yes	Yes	No	No	No	No
Exceed Threshold (tunnel boring)?	Yes	Yes	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

With respect to local impacts, SCAQMD has developed a set of local mass emission thresholds to evaluate localized impacts. According to SCAQMD, only those emissions that occur on site are to be considered in the LST analysis. Consistent with SCAQMD LST evaluation guidelines, emissions related to haul truck and employee commuting activity during construction are not considered in the evaluation of localized impacts. As shown in Table 4.6-26, localized NOx, PM_{10} and $PM_{2.5}$ emissions during construction would exceed local thresholds. As such, short-term local mass emissions would be significant under CEQA and adverse under NEPA without implementation of mitigation measures.

Table 4.6-26: Alternative 4 – Estimated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Maintenance Facility	67	53	11	6
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	101	77	13	6
Bridges and TPSS Facilities	20	16	1	1
Underground Stations and Tunnel (Cut-and-Cover)	274	207	24	1116
Underground Stations and Tunnel (Bore)	118	91	17	10
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	Yes	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

Toxic Air Contaminant Emissions

With respect to construction-period impacts, the greatest potential for TAC emissions would be related to DPM emissions associated with heavy equipment operations during project construction. Construction activities associated with the project would be sporadic, transitory, and short term in nature. The assessment of cancer risk is typically based on a 70-year exposure period; however, Alternative 4 construction is anticipated to have duration of approximately 30 months. Because exposure to diesel exhaust would be well below the 70-year exposure period, project construction is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of construction. As such, project-related toxic emission impacts during construction would be less than significant under CEQA and would not be adverse under NEPA.

Operational Impacts

Regional Criteria Pollutant Emissions

Operation of Alternative 4 would involve criteria pollutant emissions from the maintenance facility, transit vehicle propulsion, and from motor vehicles operating in the vicinity of the project. Most of the emissions related to the maintanence facility and transit vehicle propulsion would occur outside the Basin, as much of the electricity consumed in the region is produced elsewhere. Emissions from motor vehicles operating in the project vicinity, however, would occur entirely within the Basin.

As demonstrated for the 2012 Alternative 3 scenario in Table 4.6-19, there would be net reductions or negligible increases in operational emissions of criteria pollutants relative to the 2012 No Build scenario. Because roadway capacity would be reduced by the greatest amount under Alternative 3 relative to the other build alternatives, Alternative 3 represents a worst-case with respect to traffic flow. By extension, traffic operations under Alternative 4 would have less delay and more efficient operating speeds than Alternative 3, which would result in lower emissions from motor vehicles operating in the project vicinity. Furthermore, Alternative 4 would result in the greatest ridership of any of the build alternatives and would displace the greatest number of vehicle trips. On the basis of the less extensive traffic impacts and greatest transit ridership relative to the 2012 Alternative 3 scenario, net critieria pollutant emissions under the 2012 Alternative 4 scenario would be no more than those identified in Table 4.6-19. Because no SCAQMD thresholds would be exceeded under the 2012 Alternative 4 scenario and operational emissions are accounted for in the SIP, impacts would be less than significant under CEQA and would not be adverse under NEPA.

The regional VMT and travel speed profile predicted to occur under the 2040 Alternative 4 scenario would generate the regional criteria pollutant emissions estimates presented in Table 4.6-27. As shown in the table, regional criteria pollutant emissions under Alternative 4 would not exceed the SCAQMD thresholds.

Table 4.6-27: Alternative 4 – Regional Criteria Pollutant Emissions

Project Alternative	Daily Emissions in Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Maintenance Facility	2	< 1	< 1	< 1	< 1
Vehicle Propulsion	1	7	8	1	1
Traffic Emissions					
2040 Alternative 4	60,787	529,989	168,313	62,514	25,602
2040 No Build	60,862	530,143	168,455	62,523	25,606
Net Project Emissions	(73)	(134)	(147)	(8)	(3)
SCAQMD Thresholds	55	550	55	150	55
Exceed Threshold	No	No	No	No	No
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.					

Carbon Monoxide Hot-Spot Analysis

As discussed under the CO hot-spot analysis for Alternative 1 above, the Basin has continually met the state and federal ambient air quality standards for CO since 2003. Since high-volume, congested intersections are primary determinants of CO impacts, intersections projected to experience the most congested conditions under Alternative 4 were identified.

As discussed in the Air Quality Technical Report (see Appendix L), total intersection approach volumes under Alternative 4 would not exceed the maximum total intersection approach volume identified for a 2003 attainment demonstration intersection, during the AM or PM peak-hour period. In addition, as discussed in the CO hot-spot analysis for Alternative 1 above, the eastern San Fernando Valley is predicted to have lower future background CO concentrations and idle and 5-mph emission factors would be lower than those used for the 2003 AQMP attainment demonstration.

Based on Alternative 4's lower intersection approach volumes, idle emissions, and grams/mile emissions relative to the 2003 AQMP attainment demonstration, there would be no potential for Alternative 4 CO emissions at any intersection to result in an exceedance of either the NAAQS or CAAQS for CO. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Particulate Matter Hot-Spot Analysis

For the same reasons identified in the particulate matter hot-spot analysis for Alternative 1 above, Alternative 4 would not be considered a project of air quality concern, as defined by 40 CFR 93.123(b)(1). Alternative 4 would not generate new air quality violations, worsen existing violations, or delay attainment of national AAQS for $PM_{2.5}$ and PM_{10}. Potential impacts would be less than significant under CEQA and would not be adverse under NEPA.

Toxic Air Contaminant Emissions

The regional VMT and travel speed profile predicted to occur under Alternative 4 would generate the regional MSAT emissions estimates presented in Table 4.6-28. As shown in the table, there would be no material change in regional MSAT pollutant emissions under Alternative 4 when compared to the No-Build Alternative. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80% in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100%. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project. Impacts would be less than significant under CEQA and would not be adverse under NEPA.

Table 4.6-28: Alternative 4 – MSAT Emissions

Pollutant Name	Daily Emissions (pounds per day)		
	Alternative 4	No-Build Alternative	Net Emissions
Benzene	1,301	1,302	(1)
Acrolein	39	39	(< 1)
Acetaldehyde	1,052	1,053	(1)
Formaldehyde	2,378	2,379	(2)
Butadiene	196	196	(< 1)
Naphthalene	75	75	(< 1)
POM	38	38	(< 1)
Diesel PM	497	497	(< 1)
DEOG	12,347	12,356	(9)
Source: ICF, 2016; calculated using regional VMT and CT-EMFAC2014 emissions factors.			

Cumulative Impacts

Cumulative impacts would be the same as the cumulative impacts described for Alternative 1, and Alternative 4 emissions would not be cumulatively considerable.

Compliance Requirements and Design Features

Compliance requirements and design features included under Alternative 1 would also be included under Alternative 4.

Mitigation Measures

Construction Mitigation Measures

Mitigation measures MM-AQ-1 through MM-AQ-7 described for Alternative 1 would also be implemented to mitigate impacts under Alternative 4.

Operational Mitigation Measures

No mitigation measures are necessary.

Impacts Remaining After Mitigation

Without the implementation of mitigation measures, construction-period emissions for ROG and NO_x were forecasted to exceed the SCAQMD regional emissions thresholds under Alternative 4. As shown in Table 4.6-29, with the implementation of proposed mitigation measures MM-AQ-1 through MM-AQ-7, ROG and NO_x emissions would continue to exceed regional emissions thresholds. Although emissions would be reduced with mitigation, regional effects under NEPA would be adverse due to the exceedances of the ROG and NO_x regional thresholds. Impacts would remain significant under CEQA after the implementation of mitigation measures.

With the implementation of proposed mitigation measures, construction emissions under Alternative 4 would be reduced, but would exceed the LSTs for ROG, PM_{10} and $PM_{2.5}$, as shown in Table 4.6-30. Based on the reduction of emissions, localized effects under NEPA would not be adverse. However, based on the emissions of PM_{10} and $PM_{2.5}$ exceeding the LSTs, localized impacts would remain significant under CEQA after the implementation of proposed mitigation measures.

NEPA Finding

Construction effects would be considered adverse after the implementation of mitigation measures. Operation effects would not be adverse under NEPA.

CEQA Determination

Construction of Alternative 4 would result in the emission of ROGs and NO_x in excess of regional thresholds, neither of which would be reduced below the thresholds following the implementation of mitigation measures. In addition, construction of Alternative 4 would exceed the LSTs for ROG, PM_{10}, and $PM_{2.5}$ after the implementation of mitigation measures. Construction impacts under Alternative 4 would be significant under CEQA after the implementation of mitigation measures.

Table 4.6-29: Alternative 4 – Estimated Mitigated Worst-case Regional Construction Mass Emissions (pounds per day)

Construction Year/Facility	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Year 2017						
Maintenance Facility	2	27	43	<1	10	4
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	4	52	59	<1	11	5
Bridges and TPSS Facilities	<1	4	15	<1	<1	<1
Underground Stations and Tunnel (Cut-and-Cover)	16	231	213	1	29	12
Underground Stations and Tunnel (Bore)	4	49	71	<1	11	6
Concurrent Year 2017 Emissions – cut and cover	22	313	331	1	50	21
Concurrent Year 2017 Emissions – tunnel boring	10	132	188	1	32	14
Year 2018						
Maintenance Facility	81	3	20	<1	<1	<1
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	4	48	58	<1	11	5
Bridges and TPSS Facilities	0	4	15	<1	<1	<1
Underground Stations and Tunnel (Cut-and-Cover)	15	215	210	1	24	11
Underground Stations and Tunnel (Bore)	4	46	70	<1	11	5
Concurrent Year 2018 Emissions – cut and cover	101	271	303	1	36	16
Concurrent Year 2018 Emissions – tunnel boring	89	102	164	<1	22	10
Year 2019						
Maintenance Facility **(Complete)**	—	—	—	—	—	—
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	29	2	21	<1	2	1
Bridges and TPSS Facilities **(Complete)**	—	—	—	—	—	—
Underground Stations and Tunnel (Cut-and-Cover)	1	9	36	<1	1	<1
Underground Stations and Tunnel (Bore)	1	9	36	<1	1	<1
Concurrent Year 2019 Emissions – cut and cover	31	10	57	<1	3	1
Concurrent Year 2019 Emissions – tunnel boring	31	10	57	<1	3	1
Maximum Daily Emissions – cut and cover	101	313	331	1	50	21
Maximum Daily Emissions – tunnel boring	89	132	188	1	32	14
Regional Construction Threshold	75	100	550	150	150	55
Exceed Threshold (cut and cover)?	Yes	Yes	No	No	No	No
Exceed Threshold (tunnel boring)?	Yes	Yes	No	No	No	No
Source: CalEEMod emissions modeling by ICF International 2015.						

Table 4.6-30: Alternative 4 – Estimated Maximum Localized Construction Mass Emissions (pounds per day)

Construction Activity	NO_X	CO	PM_{10}[a]	$PM_{2.5}$[a]
Maintenance Facility	27	43	10	4
At-Grade Track Installation, Sidewalks/Curbs, Aboveground Stations	52	59	11	5
Bridges and TPSS Facilities	4	15	<1	<1
Underground Stations and Tunnel (Cut-and-Cover)	231	213	29	12
Underground Stations and Tunnel (Bore)	49	71	11	6
Localized Significance Thresholds [b]	80	498	4	3
Exceed Thresholds?	Yes	No	Yes	Yes

[a] PM_{10} and $PM_{2.5}$ emissions estimates assume compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.
[b] The project site is in SCAQMD SRA Number 7 (Eastern San Fernando Valley). LSTs shown herein are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and the approximate local project construction size (1 acre).
Source: CalEEMod emissions modeling by ICF International 2015.

The operation of Alternative 4 would result in decreased emissions of criteria and MSAT pollutants. In addition, no localized operational impacts related to hot-spots for CO or particulate matter were identified. Therefore, operational impacts under Alternative 4 would be less than significant under CEQA.