4.5 Air Quality

This section describes the air quality conditions for the project area and analyzes both short-term impacts of emissions during construction and long-term impacts associated with operations of each Regional Connector alternative. It also summarizes potential impacts to air quality and inhalation health risks. The analysis includes the preparation of emissions inventories for construction and operations, health risk assessments for construction activities, and a carbon monoxide (CO) hot spots analysis. Information in this section is based on the Air Quality Impacts and Health Risk Assessment Technical Memorandum prepared for the project contained in Appendix Q of this EIS/EIR.

This section has been updated since publication of the Draft EIS/EIR to address comments received on the Draft EIS/EIR, as indicated in the Responses to Comments, Volumes F-2 and F-3, of this Final EIS/EIR, and based on refinements to the Locally Preferred Alternative (LPA). A vertical line in the margin is used to show where revisions have occurred to this section since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Minor changes were made to the numerical values stated in this section. Average weekday values were calculated in the Draft EIS/EIR for vehicle miles traveled (VMT) and other measures based on VMT. In order to report annual values for VMT in the Draft EIS/EIR, a multiplier (annualization factor) was used to convert the daily values. This annualization factor has been updated for this Final EIS/EIR to maintain consistency with other Metro projects, and has caused annual VMT and other annualized measures based on VMT to change slightly. Since designation of an LPA, mitigation measures have been refined and confirmed for the LPA, which are listed in Section 4.5.4.2 below, based on input received during the Draft EIS/EIR public review period. No changes to the NEPA impact findings or CEQA impact determinations were identified as a result of refinements to the LPA, responses to comments, or other developments since publication of the Draft EIS/EIR. Mitigation measures listed for the LPA in this section have been carried forward and included in the Mitigation Monitoring and Reporting Program (MMRP) for the LPA, Chapter 8, of this Final EIS/EIR.

The analysis of air quality impacts associated with the LPA is detailed below in Section 4.5.3.

4.5.1 Regulatory Framework and Standards of Significance

Federal, state, and local governments all share responsibility for air quality management. The Clean Air Act (CAA) and the California Clean Air Act (CCAA) are the primary statutes that establish ambient air quality standards. They establish regulatory authorities to design and enforce air quality regulations.

4.5.1.1 Regulatory Framework

Under authority of the CAA, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants that are considered harmful to public health and welfare: CO, lead (Pb), nitrogen dioxide (NO_2), ozone (O_3) (commonly known as "smog"), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). Ozone is a secondary pollutant, meaning that it is formed in the atmosphere from

reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to formation of O_3 include volatile organic compounds (VOC) and oxides of nitrogen (NO_x). Since the formation of ozone is complex and difficult to assess on a project level, air quality impact analyses address ozone by analyzing emissions of NO_x and VOC precursors instead. Fine particulate matter ($PM_{2.5}$) can be emitted directly from sources (engines) or can form in the atmosphere from precursor compounds. $PM_{2.5}$ precursor compounds include SO_x, NO_x, VOC, and ammonia.

The CAA specifies dates for achieving compliance with NAAQS and identifies specific emission reduction goals for noncompliant areas. The South Coast Air Basin (SoCAB) is designated as a federal non-attainment area for O_3, PM_{10}, and $PM_{2.5}$, and is in attainment for all other pollutants, including CO, NO_2, SO_2, and Pb.

Approval, funding, and implementation of Federal Highway Administration (FHWA) and Federal Transit Authority (FTA) projects are subject to transportation conformity regulations under the CAA (40 CFR 93, Subpart A). If a potential project is included in a conforming Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP), the project is already included in emission budgets developed for the region. Thus, a unique, regional analysis of project emissions would not be required. However, analysis regarding possible localized impacts is still required.

The State of California also has air quality regulations outlined in the California Ambient Air Quality Standards (CAAQS), which are at least as stringent as, and often more stringent than NAAQS. Further information on NAAQS, CAAQS, and CAA standards are provided in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. Other applicable local plans and regulations include:

- Southern California Association of Governments (SCAG) Regional Transportation Plan
- SCAG Regional Transportation Improvement Program
- South Coast Air Quality Management District (SCAQMD) Air Quality Management Plans

Under the CAA Amendments of 1990, which direct the EPA to implement environmental measures to ensure acceptable levels of air quality, a project cannot:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

4.5.1.2 Standards of Significance

NAAQS are used to determine air quality impacts under NEPA. The most recent thresholds of significance published by the SCAQMD were released in 2009. These thresholds supersede the

City of Los Angeles thresholds; therefore, this analysis uses the most recent significance thresholds from the SCAQMD to determine air quality impacts under CEQA. Many of these thresholds are presented in Tables 4.5-2 through 4.5-4, below.

Significance thresholds developed by the SCAQMD for local air quality impacts from construction activities (SCAQMD 2003 and SCAQMD 2006) and for both carcinogenic and non-carcinogenic toxic air contaminants (TACs) were used in this analysis. These thresholds are presented in Tables 4.5-2 through 4.5-4, below.

In accordance with Transportation Conformity (40 CFR 93, Subpart A), localized concentrations of CO were analyzed for this project. The analysis looks at surface traffic intersections, with the highest potential CO concentrations, that would be altered by the project, either during construction or after project completion.

4.5.2 Affected Environment

The air quality area of analysis includes the four-county region covered by the SoCAB (all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties). The SoCAB area has high levels of air pollution, particularly from June through September. Pollutant concentrations in the SoCAB vary by location, season, and time of day. Concentrations of O_3, for example, tend to be lower along the coast and in far inland areas of the basin and adjacent desert and higher in and near inland valleys.

Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California. Previously, the EPA designated SoCAB as a non-attainment area for all NAAQS except SO_2. The EPA now designates SoCAB as in attainment for NO_2, Pb, SO_2, and CO. PM_{10}, $PM_{2.5}$, and O_3 levels, while reduced substantially from their peak, remain above relevant NAAQS and CAAQS.

In completing the health risk assessment required under CEQA, this study identified sensitive receptors within the project area. Sensitive receptors are typically locations where the elderly, children, or other groups with a greater susceptibility to adverse health effects could be located. These locations include schools, hospitals, convalescent homes, parks, and daycare facilities. More information on the sensitive receptors in the project area is available in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum.

4.5.3 Environmental Impacts/Environmental Consequences

Impact conclusions for all of the alternatives are based on the thresholds summarized in Section 4.5.1.2 and identified in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. Section 4.5.3.1 through Section 4.5.3.4 summarizes the transportation conformity, mobile source air toxic analysis, and anticipated emissions generated during construction and operation of each alternative. Section 4.5.3.5 through Section 4.5.3.7 provides an evaluation of potential air quality impacts for each alternative. Table 4.5-1 summarizes the results of the analysis.

4.5.3.1 Transportation Conformity

A transportation conformity determination is required for approval, funding, or implementation of FWHA/FTA projects. The Regional Connector Transit Corridor project would decrease the overall number of vehicles in the region, and it would not cause an increase in diesel vehicles. As a result, the proposed project would neither cause new PM_{10} or $PM_{2.5}$ hot spots nor increase the frequency or severity of existing PM_{10} or $PM_{2.5}$ violations. No localized adverse impacts from CO are expected under this project. The proposed project would implement the various PM_{10} and $PM_{2.5}$ control measures contained in the RTP and RTIP and meet the requirements of §93.117. No further action is required for transportation conformity.

Table 4.5-1. Summary of Potential Impacts to Air Quality

Alternative	Construction Effects (NEPA/CEQA)[1]	Operational Effects (NEPA/CEQA)	Adverse NEPA Effects After Mitigation[1]	Significant CEQA Impacts After Mitigation
No Build	None	None	None	None
TSM	None	Adverse effect	None	None
At-Grade Emphasis LRT	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation
Underground Emphasis LRT	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation
LPA[2]	Temporary regional adverse effects/significant impacts	Beneficial effects	Adverse construction-related regional effects remain after mitigation	Significant construction-related regional impacts remain after mitigation

Notes:
[1] Thresholds of significance for CEQA were used to analyze construction impacts under NEPA because NEPA does not contain air quality thresholds specific to construction.
[2] Air quality impacts from the construction and operation of the LPA (which only includes three stations) would be less than or equal to the construction- and operation-related air quality impacts from the Fully Underground LRT Alternative (which included four stations).

4.5.3.2 Mobile Source Air Toxics (MSAT)

The FHWA published an Interim Guidance Update on Mobile Source Air Toxic Analyses in NEPA Documents on September 30, 2009. This guidance document establishes a tiered approach for analyzing mobile source air toxics (MSAT) in NEPA, with the first tier being no analysis for projects with no potential for meaningful MSAT effects. The Regional Connector Transit Corridor project would have no MSAT effects because VMT for each of the build alternatives would decrease compared to the No Build Alternative. The proposed project falls within the first tier of MSAT analysis, so no further action is required.

4.5.3.3 Construction Emissions Results

Potential construction emissions were estimated and compared to thresholds of significance published by the SCAQMD. The SCAQMD also recommends that localized impacts be evaluated for significance. Thus, this section summarizes construction air quality impacts locally and regionally.

The build alternatives, including the LPA, would result in temporary emissions associated with construction. Construction would occur between and including the years 2014 and 2017. Construction emissions were analyzed with the methodology developed by the SCAQMD in its CEQA Air Quality Handbook (1993). Fugitive dust and engine exhaust emissions were characterized into the following main categories:

- Grading and excavation
- Heavy-duty equipment on unpaved areas
- Paved road dust (haul/delivery trucks)
- Loading/unloading of trucks
- Vehicle trips (including construction worker commuting and haul/delivery trucks)

Although the analysis used the CEQA Air Quality Handbook to estimate emissions, several emission factors and calculation methods in the Handbook are outdated. Thus, the analysis used current versions of the EMFAC and OFFROAD models, to generate on- and off-road emission factors, respectively, instead of the mobile source emission factors established in the CEQA Air Quality Handbook. The analysis used the Midwest Research Institute (MRI) Improvement of Specific Emission Factors report as necessary to update the fugitive dust emission factors identified in the CEQA Air Quality Handbook (MRI 1996). The analysis used EPA's Compilation of Air Pollutant Emission Factors (AP-42) to estimate emissions from fugitive dust (EPA 1995).

Dust emissions and dirt track-out would be minimized through compliance with SCAQMD Rule 403. Although projects are required to follow all of the Best Available Control Measures described in the rule, several of the key measures applicable to this project are as follows:

- For cut and fill at large sites, pre-water with sprinklers or water trucks and allow time for penetration.
- Apply water or stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
- Track-out shall not extend 25 feet or more in cumulative length from the point of origin from an active operation. All track-out from an active operation shall be removed at the conclusion of each workday or evening shift.

- If the disturbed surface area is five acres or more, or if the daily import or export of bulk material is 100 cubic yards or more, then at least one of the following precautions must also be taken.
  - Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.
  - Pave the surface extending at least 100 feet and at least 20 feet wide.
  - Use a wheel shaker/wheel spreading device consisting of raised dividers at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.
  - Install and use a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

4.5.3.3.1 Regional Construction Emissions

Emissions from construction of the project are analyzed under CEQA. Thresholds of significance developed for CEQA, and summarized in Section 4.5.1.2, were also used for the NEPA analysis, since CEQA requirements are at least as stringent as NEPA requirements. Construction emissions would not occur if not for the project, so baseline emissions are assumed to be zero. Short-term, peak, daily emissions of VOC, NO_x, CO, and $PM_{2.5}$ would exceed thresholds of significance for CEQA under all build alternatives. In addition, emissions of PM_{10} would exceed thresholds of significance for CEQA for the At-Grade Emphasis LRT Alternative. Table 4.5-2 summarizes construction emissions by peak day of operation for all build alternatives, including the LPA. The Underground Emphasis LRT Alternative has four construction sub-alternatives, as it pertains to air quality. The proposed 2nd/Hope Street station could be constructed using either the Sequential Excavation Method (SEM) or cut and cover method. In addition, two station options were considered along 2nd Street for the Underground Emphasis LRT Alternative (2nd/Broadway or 2nd/Los Angeles Street station). This emissions analysis, summarized in Table 4.5-2, evaluated all four construction options. The LPA has two construction sub-alternatives that were analyzed for potential effects on air quality. The proposed 2nd/Hope Street station could be constructed using either the SEM or cut and cover method. This emissions analysis evaluated both construction options, as summarized in Table 4.5-2.

4.5.3.3.2 SCAQMD Localized Significance Thresholds (LST)

In June 2003 (revised July 2008), the SCAQMD developed a methodology to evaluate localized construction impacts on air quality that would account for air dispersion. Maximum daily emissions for each project construction activity, considering their locations, were compared to relevant LSTs. The comparison, included in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum, assumes a one-acre site for each construction activity and a distance of 25 meters to the nearest sensitive receptor. This approach provides conservative results for the LST analysis. After implementation of mitigation measures identified in the air quality section of Chapter 8, the MMRP for the LPA, emissions of all pollutants would be less

than LST thresholds for all build alternatives, including the LPA. Thus, construction-related pollutant concentrations would not be significant.

Table 4.5-2. Summary of Unmitigated Peak Daily Construction Emissions

Alternative	Unmitigated Peak Daily Construction Emissions (lbs/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
At-Grade Emphasis LRT Alternative	**289**	**2,175**	**1,150**	4	**151**	**126**
Underground Emphasis LRT Alternative						
2nd/Hope Station SEM Construction Method with 2nd/Broadway Station Option	**308**	**2,336**	**1,249**	4	111	**89**
2nd/Hope Station Cut and Cover Construction Method with 2nd/Broadway Station Option	**313**	**2,375**	**1,272**	4	113	**90**
2nd/Hope Station SEM Construction Method with 2nd/Los Angeles Station Option	**308**	**2,332**	**1,247**	4	110	**89**
2nd/Hope Station Cut and Cover Construction Method with 2nd/Los Angeles Station Option	**313**	**2,371**	**1,270**	4	113	**90**
LPA[1]						
2nd/Hope Station SEM Construction Method	**376**	**2,699**	**1,542**	5	129	**102**
2nd/Hope Station Cut and Cover Construction Method	**386**	**2,777**	**1,593**	5	133	**105**
SCAQMD Significance Threshold	75	100	550	150	150	55

Notes:
*Emissions greater than threshold of significance are shown in **bold**.*
SEM = Sequential Excavation Method. Application of SEM would have less surface disruption than the cut and cover method since the excavation would be performed mostly underground and accessed via a vertical shaft.
[1] The construction emissions are based on the Fully Underground LRT Alternative, which included the construction of four stations. Emissions generated from construction of the LPA (which only includes three stations) would be equal to or less than the construction emissions estimated for the Fully Underground LRT Alternative.

4.5.3.4 Operational Emissions Results

4.5.3.4.1 NEPA Results

NEPA analysis requires comparing emissions for the future project year (2035) to those for the No Build Alternative (2035). Incremental annual operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative are summarized in Table 4.5-3 for NEPA. Each of the alternatives reduced highway VMT when compared to the No Build Alternative, which would result in a reduction in emissions generated by motor vehicles. The LPA would result in the greatest reduction of annual operational emissions. The TSM Alternative, however, would result in additional compressed natural gas (CNG) bus emissions.

NO_x emissions would increase beyond the NEPA significance threshold under the TSM Alternative.

Table 4.5-3. Incremental Annual Operational Emissions Compared to the No Build Alternative

Alternative	Incremental Emissions (tons per year)[1,2]					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
TSM	(2)	(72)	**17**	(<1)	(37)	(6)
At-Grade Emphasis	(2)	(92)	(6)	(1)	(45)	(10)
Underground Emphasis	(2)	(95)	(6)	(1)	(46)	(10)
LPA[3]	(2)	(98)	(6)	(1)	(48)	(11)
NEPA Threshold	10	100	10	100	70	100

Notes:
[1] Incremental emissions are determined by subtracting the given alternative emissions from the No Build Alternative emissions.
*[2] Emission reductions (beneficial impacts) are shown in parentheses and emissions greater than threshold of significance are shown in **bold**.*
[3] The operational emissions are based on the Fully Underground LRT Alternative, which included four stations. Operational emissions associated with the LPA (which only includes three stations) would be equal to or less than the operational emissions estimated for the Fully Underground LRT Alternative.

4.5.3.4.2 CEQA Results

The CEQA analysis completed for the Regional Connector Transit Corridor project includes incremental daily operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative (2035), which are summarized in Table 4.5-4. The determination of significant impacts within the CEQA analysis of daily, traffic-related operational emissions is based on a comparison to the No Build Alternative, which accounts for regional growth and increases in background traffic that would occur independent of the project.

In addition per the CEQA Guidelines, a significant impact would occur if the project would create objectionable odors affecting a substantial number of people. The No Build, TSM, and LRT Alternatives would not generate objectionable odors affecting a substantial number of people. Typical sources of objectionable odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, refineries, and in some instances restaurants. None of the alternatives include these land uses and, therefore, no impacts associated with objectionable odors would occur.

4.5.3.4.3 CO Hot Spots Analysis

Five intersections with the most potential for adverse impacts were analyzed using the CAL3QHC model. This is the EPA preferred model for CO hot spots modeling. The results of the analysis are provided in Table 4.5-5. Concentrations of CO at the intersections would not exceed the CAAQS or NAAQS for any of the alternatives, including the LPA. Thus, the CO hot spots would not be significant.

Table 4.5-4. Incremental Daily Operational Emissions Compared to the No Build Alternative (2035)

Alternative	Incremental Emissions (lbs/day) [1,2]					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
TSM	0	(400)	0	(100)	(200)	0
At-Grade Emphasis	0	(500)	(100)	(100)	(300)	0
Underground Emphasis	0	(600)	(100)	(100)	(300)	0
LPA[3]	0	(600)	(100)	(100)	(300)	0
CEQA Threshold	55	550	55	150	150	55

Notes:
[1] Incremental emissions are determined by subtracting the given alternative emissions from the No Build Alternative emissions.
[2] Emission reductions (beneficial impacts) are shown in parentheses.
[3] The operational emissions are based on the Fully Underground LRT Alternative, which included four stations. Operational emissions associated with the LPA (which only includes three stations) would be equal to or less than the operational emissions estimated for the Fully Underground LRT Alternative.

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
Existing Conditions (2009)					
5	1st Street and Main Street	4.20	3.17	no	no
12	2nd Street and Hill Street	3.90	2.96	no	no
57	Temple Street and Main Street	4.20	3.17	no	no
58	Temple Street and Los Angeles Street	4.20	3.17	no	no
60	Temple Street and Alameda Street	4.20	3.17	no	no
No Build Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO) (continued)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
60	Temple Street and Alameda Street	1.40	1.04	no	no
TSM Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
At-Grade Emphasis LRT Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.50	1.11	no	no
58	Temple Street and Los Angeles Street	1.30	0.97	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
Underground Emphasis LRT Alternative (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.40	1.04	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no
LPA[4] (2035)					
5	1st Street and Main Street	1.40	1.04	no	no
12	2nd Street and Hill Street	1.30	0.97	no	no

Table 4.5-5. Summary of CO Hot Spots Analysis (Localized Concentrations of CO) (continued)

ID	Intersection	Max. CO Conc. (ppm)[1]		Significance	
		1-Hour	8-Hour	1-Hour[2]	8-Hour[3]
57	Temple Street and Main Street	1.40	1.04	no	no
58	Temple Street and Los Angeles Street	1.40	1.04	no	no
60	Temple Street and Alameda Street	1.40	1.04	no	no

Notes:
[1] Maximum concentrations for a given year include the ambient background CO concentrations (1-hour and 8-hour) for that year.
[2] 1-Hour CAAQS = 9.0 ppm; 1-Hour NAAQS = 9 ppm
[3] 8-Hour CAAQS = 20 ppm; 8-Hour NAAQS = 35 ppm
[4] CO concentrations are for the Fully Underground LRT Alternative. CO concentrations under the LPA (which only includes three stations) would be less than or equal to the CO concentrations under the Fully Underground LRT Alternative (which included four stations).

4.5.3.5 No Build Alternative

The No Build Alternative would not result in any construction emissions. The No Build Alternative would not create new emissions or have negative operational air quality impacts. However, the No Build Alternative would not reduce regional VMT-related emissions like the other alternatives.

The No Build Alternative would involve neither construction nor new transit operations. Therefore, the No Build Alternative would not contribute to cumulative impacts.

4.5.3.5.1 NEPA Finding

The No Build Alternative would not result in adverse effect to air quality.

4.5.3.5.2 CEQA Determination

The No Build Alternative would not result in significant air quality impacts.

4.5.3.6 TSM Alternative

The TSM Alternative would not involve any construction beyond installation of bus stops, so no construction emissions would occur. Emissions from operation of buses associated with the TSM Alternative are considered together with highway emissions. The resulting emissions were compared to thresholds of significance for CEQA and NEPA. Emissions of criteria pollutants under this alternative would not exceed CEQA thresholds; thus, they would not be significant, as shown in Table 4.5-4. However, as shown in Table 4.5-3, the projected NO_x emissions increase of 17 tons per year, as a result of the increase in bus and highway emissions compared to the No Build Alternative, would exceed the NEPA significance threshold of 10 tons per year.

This alternative would result in substantial reductions in peak daily emissions of CO, SO_2, and PM_{10}. Impacts from emissions of these pollutants would not be cumulatively significant.

However, the federally-approved RTP and RTIP include an electric light rail project like the Regional Connector project. Not developing such a project would result in higher VMT and emissions than listed in the RTP Programmatic Environmental Impact Report. Thus, cumulative impacts could be adverse under NEPA.

4.5.3.6.1 NEPA Finding

The TSM Alternative would not have adverse construction effects on air quality. This alternative would have adverse operational effects on air quality associated with the NO_x emissions increase under NEPA criteria for both buses and regional traffic. It is possible that using alternative fuels to run the new shuttle buses would reduce this impact.

4.5.3.6.2 CEQA Determination

The TSM Alternative would not have significant construction or operational impacts on air quality under CEQA criteria.

4.5.3.7 Build Alternatives (including the Locally Preferred Alternative)

Table 4.5-2 shows construction emissions by peak day of operation for all build alternatives, including the LPA. The analysis estimates emissions from off-road construction equipment, fugitive dust, construction worker commuting, and haul trucks. Emissions of VOC, NO_x, CO, and $PM_{2.5}$ would be significant according to SCAQMD thresholds for all build alternatives, including the LPA, and mitigation measures would need to be implemented. The LPA would generate greater emissions of VOC, NO_x, and CO and the At-Grade Emphasis LRT Alternative would generate greater emissions of $PM_{2.5}$ when compared to the other build alternatives. In addition, emissions of PM_{10} would be significant according to SCAQMD thresholds for the At-Grade Emphasis LRT Alternative.

Construction emissions on a regional level were evaluated for all build alternatives, including the LPA, and compared to SCAQMD's LSTs. The comparison is included in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum. LST evaluation indicates that NO_x, PM_{10}, and $PM_{2.5}$ emissions would be greater than maximum allowable levels during several construction phases. The Underground Emphasis LRT Alternative and the LPA would generate greater emissions of NO_x, compared to the At-Grade Emphasis LRT Alternative and the At-Grade Emphasis LRT Alternative would generate greater emissions of PM_{10} and $PM_{2.5}$ when compared to the other build alternatives. Therefore, LST impacts of these pollutants would be significant. With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions would be reduced below the maximum allowable emissions under the LST methodology and therefore less than significant. LST data is provided in Appendix Q, Air Quality Impacts and Health Risk Assessment Technical Memorandum.

The CEQA analysis completed for the Regional Connector Transit Corridor project build alternatives included incremental daily operational emissions associated with each of the proposed alternatives, including the LPA, above the No Build Alternative (2035), which are summarized in Table 4.5-4 according to CEQA thresholds and Table 4.5-3 according to NEPA thresholds.

The determination of significant impacts within the CEQA analysis of daily, traffic-related operational emissions is based on a comparison to the No Build Alternative, which accounts for regional growth and increases in background traffic that would independently occur from the project. Compared to the No Build Alternative, the daily incremental emissions associated with each build alternative would either decrease or remain unchanged for all pollutants under all alternatives, including the LPA (Table 4.5-4); thus all operational emission impacts are less than significant under CEQA. Overall, vehicular travel would decrease as a result of the project, which would result in a reduction in emissions generated by motor vehicles. This result would be consistent with air quality goals in the region.

NEPA analysis requires comparing emissions for the future project year (2035) to those for the No Build Alternative (2035), which is presented in Table 4.5-3. Incremental annual operational emissions associated with each of the proposed build alternatives, including the LPA, would improve compared to the No Build Alternative, with the LPA resulting in greatest overall improvement in annual operational emissions.

4.5.3.7.1 NEPA Finding

Thresholds of significance for CEQA were used to analyze construction impacts under NEPA because NEPA does not contain air quality thresholds specific to construction. Even with implementation of mitigation during construction, regional construction emissions of VOC, NO_x, and CO will remain adverse for all build alternatives, including the LPA. With incorporation of mitigation measures, construction of the LPA will still result in a considerable contribution to cumulative air quality effects associated with regional construction emissions under NEPA.

With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions will be reduced below the maximum allowable emissions under the LST methodology and therefore not adverse.

All of the build alternatives, including the LPA, would have no adverse effects from operational emissions. Therefore, all of the build alternatives, including the LPA, would not result in a considerable contribution to cumulative air quality effects associated with regional operational emissions. Although regional construction emissions under the build alternatives, including the LPA, would be adverse after mitigation, the reduction in regional VMT as a result of project implementation would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

4.5.3.7.2 CEQA Determination

Even with implementation of mitigation during construction, regional construction emissions of VOC, NO_x, and CO would remain significant and unavoidable under CEQA for all build alternatives, including the LPA. With incorporation of mitigation measures, construction of the LPA would still result in a considerable contribution to cumulative air quality impacts associated with regional construction emissions under CEQA.

With implementation of mitigation identified under the air quality section in Chapter 8, the MMRP for the LPA, localized construction emissions would be reduced below the maximum allowable emissions under the LST methodology and therefore less than significant.

All of the build alternatives, including the LPA, would have no significant impact from operational emissions. Therefore, all of the build alternatives, including the LPA, would not result in a considerable contribution to cumulative air quality impacts associated with regional operational emissions. Although regional construction emissions under the build alternatives, including the LPA, would be significant and unavoidable, the reduction in regional VMT as a result of project implementation would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality.

4.5.4 Mitigation Measures

4.5.4.1 Updates to the Candidate Mitigation Measures from the Draft EIS/EIR

The Draft EIS/EIR included candidate mitigation measures for review and comment by the public, agencies, and other stakeholders. Since publication of the Draft EIS/EIR, Metro has added specificity to the candidate mitigation measures for air quality impacts presented in the Draft EIS/EIR. The final LPA mitigation measures, shown in Section 4.5.4.2 below, are included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR, and supersede candidate mitigation measures identified in the Draft EIS/EIR. Updates to the mitigation measures made since publication of the Draft EIS/EIR include:

- Projects are required to follow the SCAQMD Rule 403 and all of the Best Available Control Measures described in the rule. Nonetheless, several Rule 403 standards applicable to this project have been included as mitigation measures.
- The addition of the California Vehicle Code for haul trucks.
- The addition of California Air Resources Board (CARB) requirements.
- The addition of EPA emission standards.

4.5.4.1.1 Regional Construction Emissions

Emissions of VOC, NO_X, CO, and $PM_{2.5}$ would be significant during construction for the build alternatives, including the LPA, and emissions of PM_{10} would be significant during construction for the At-Grade Emphasis LRT Alternative. Exhaust emissions from the operation of off-road vehicles are responsible for most of the emissions during construction. Separate emissions were calculated for each alternative to evaluate how implementation of mitigation, using up-to-date engines, during the year 2014 to 2017 project construction period could reduce emissions of criteria pollutants. The results of this analysis are provided in Table 4.5-6 and can be compared to the emissions in Table 4.5-2, Summary of Unmitigated Peak Daily Construction Emissions.

Table 4.5-6. Mitigated (2014-2017)
Maximum Daily Construction Emissions for All Alternatives

Alternative	Mitigated Daily Emissions (lbs/day)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
At-Grade Emphasis LRT Alternative	**119**	**432**	**908**	4	27	12
Underground Emphasis LRT Alternative						
2nd/Hope Station SEM Construction Method with 2nd/Broadway Station Option	**144**	**473**	**978**	4	27	12
2nd/Hope Station Cut and Cover Construction Method with 2nd/Broadway Station Option	**147**	**488**	**998**	4	28	12
2nd/Hope Station SEM Construction Method with 2nd/Los Angeles Station Option	**144**	**469**	**977**	4	27	12
2nd/Hope Station Cut and Cover Construction Method with 2nd/Los Angeles Station Option	**146**	**485**	**997**	4	28	12
LPA[1]						
2nd/Hope Station SEM Construction Method	**189**	**602**	**1,266**	5	35	16
2nd/Hope Station Cut and Cover Construction Method	**193**	**626**	**1,304**	5	36	16
SCAQMD Significance Threshold	75	100	550	150	150	55

Notes:
*Emissions greater than threshold of significance are shown in **bold**.*
[1] Mitigated construction emissions are for the Fully Underground LRT Alternative. Mitigated construction emissions for the LPA (which only includes three stations) would be less than or equal to mitigated construction emissions for the Fully Underground LRT Alternative (which included four stations).

With implementation of mitigation, emissions of VOC, NO_x, and CO will still exceed the CEQA thresholds of significance for construction and are therefore significant and unavoidable for the all three LRT alternatives. Although the regional construction impacts remain significant, the proposed Regional Connector Transit Corridor project would improve transportation in the region by helping to remove vehicles from the region's roadways, which would reduce emissions generated by motor vehicles and provide a net beneficial impact to air quality. Future operational emissions under the build alternatives are less than the baseline emissions for several pollutants as shown in Tables 4.5-3 and 4.5-4.

4.5.4.1.2 Localized Significance Thresholds

Mitigated emissions were also compared to the SCAQMD's LST to evaluate significance. Mitigated emissions levels for each construction site will be less than the maximum allowable emissions under the LST methodology. Therefore, with implementation of mitigation, localized

emissions from construction activities will be less than significant for the build alternatives. Data is available in Appendix Q, Air Quality Impacts and Health Risk Technical Memorandum.

4.5.4.2 Final Mitigation Measures for the Locally Preferred Alternative

Mitigation measures listed for the LPA in this section have been carried forward and included in the MMRP for the LPA, Chapter 8, of this Final EIS/EIR. They are the final committed mitigation measures for the LPA. MMRP index numbers are shown in parenthesis after each mitigation measure.

- Contractors shall be required to adhere to SCAQMD standards for off-road engine emissions (refer to Section 4.5.1.1). Examples of how the contractors could ensure adherence include retrofitting off-road engines with add-on control devices such as catalytic oxidizers and diesel particulate filters where feasible. (AQ-1)
- Metro shall require contractors to use equipment that meets up-to-date specifications (equivalent to models manufactured from 2013 to 2017) for pollutant emissions during project construction. (AQ-2)
- Contractors shall be required to adhere to SCAQMD standards for dust emissions such as SCAQMD Rule 403. Examples of how the contractors could ensure adherence include applying water or a stabilizing agent to exposed surfaces in sufficient quantity to prevent generation of dust plumes. (AQ-3)
- Dirt from construction equipment shall not extend 25 feet or more from an active operation, and shall be removed at the conclusion of each workday (refer to Section 4.5.3.3). Street sweeping services shall be coordinated with construction activity to minimize impacts to surrounding businesses and residences. (AQ-4)
- Contractors shall be required to utilize at least one of the measures set forth in the SCAQMD Rule 403 Section (d)(5) to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site. (AQ-5)
- All haul trucks hauling soil, sand, and other loose materials shall maintain at least six inches of freeboard (not filling trucks all the way to the top) in accordance with California Vehicle Code 23114. (AQ-6)
- All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce dust emissions) (refer to Section 4.5.1.1). (AQ-7)
- Traffic speeds on unpaved roads shall be limited to 15 MPH. (AQ-8)

When wind gusts exceed 25 MPH, Metro shall require the contractor to implement the following provisions, consistent with the requirements of SACQMD Rule 403, as they apply to each of the construction activities identified below: (AQ-9)

- Earth-moving activities:
  - (1A) Cease all active operations; or
  - (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
- Disturbed surface areas:
  - (OB) On the last day of active operations prior to a weekend or holiday: apply water with a mixture of chemical stabilizer diluted with not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; or
  - (1B) Apply chemical stabilizers prior to wind event; or
  - (2B) Apply water to all unstabilized disturbed areas three times per day. If there is evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or
  - (3B) Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or
  - (4B) Utilize any combination of control actions (1B), (2B) and (3B) such that, in total, these actions apply to all disturbed surface areas.
- Unpaved roads:
  - (1C) Apply chemical stabilizers prior to wind event; or
  - (2C) Apply water twice per hour during active operation; or
  - (3C) Stop all vehicular traffic.
- Open storage piles:
  - (1D) Apply water twice per hour; or
  - (2D) Install temporary coverings.

- Paved road track-out:
  - (1E) Cover all haul vehicles; or
  - (2E) Comply with vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
- All categories:
  - (1F) Any other control measures approved by the Executive Officer and the USEPA as equivalent to the methods specified may be used.
- Heavy equipment operations shall be suspended during second stage smog alerts as issued by the SCAQMD. (AQ-10)
- On-site stockpiles of debris, dirt, or rusty materials shall be covered or watered at least two times per day. (AQ-11)
- Contractors shall utilize electricity supplied by the Los Angeles Department of Water and Power (LADWP) rather than temporary diesel or gasoline generators, as feasible. (AQ-12)
- Heavy-duty trucks shall be prohibited from idling in excess of five minutes, both on- and off-site. Metro shall employ CARB anti-idling requirements during construction, which would reduce emissions generated from construction vehicles. Metro shall require the contractor to regularly perform unscheduled inspections of construction equipment and activities to ensure minimization of associated air quality impacts. (AQ-13)
- Construction worker parking shall be configured to minimize traffic interference. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-14)
- Construction activity that affects traffic flow on the arterial system, including the transportation of excavated materials, shall be primarily limited to off-peak hours. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-15)
- Metro shall require ongoing maintenance and adherence to manufacturer's specifications for all construction equipment engines and vehicles. (AQ-16)
- Dedicated turn lanes for the movement of trucks and equipment to and from construction sites shall be provided where appropriate. This measure would minimize vehicle idling time, which would reduce emissions generated from construction vehicles. (AQ-17)
- Metro shall require on-site construction equipment to meet EPA Tier 2 or higher emission standards according to the January 1, 2012 to December 31, 2014 and post-January 15, 2015 criteria. (AQ-18)

- Metro shall maintain and clean all trucks and construction equipment. (AQ-19)
- Metro shall use low-sulfur fuel where possible. (AQ-20)
- The project and stations shall be designed and constructed in a manner consistent with Metro's sustainability policies (such as Metro's Energy and Sustainability Policy). (AQ-21)
- Detour routes shall be designed to ensure that traffic does not idle for extended periods of time, thus reducing the potential for localized exceedence of federal CO/CO_2 standards. (AQ-22)