Section 4.7
Air Quality

This section summarizes the potential for air quality impacts resulting from construction and operation of the proposed Eastside Transit Corridor Phase 2 Project alternatives. Information in this section is based on, and updated where appropriate from, the Air Quality Impacts and Health Risk Assessment Technical Memorandum, which is incorporated into this Draft EIS/EIR as Appendix R. Greenhouse gas and climate change impacts are discussed in Section 4.8, Climate Change, of this Draft EIS/EIR.

4.7.1 Regulatory Framework/Methodology

4.7.1.1 Regulatory Framework

The Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) are the primary statutes that establish ambient air quality standards. Under authority of the CAA, the U.S. Environmental Protection Agency (USEPA) established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and sulfur dioxide (SO_2). Typical health effects of these pollutants include the following:

- O_3: Eye irritation and respiratory function impairment
- CO: Impairment of oxygen transport in the bloodstream; aggravation of cardiovascular disease; and fatigue, headache, and dizziness
- NO_2: Increased risk of acute and chronic respiratory disease
- SO_2: Increased risk of acute and chronic respiratory disease
- PM_{10} and $PM_{2.5}$: Aggravation of chronic disease and heart and lung disease symptoms

The CCAA, signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practicable date. CAAQS are at least as stringent as, and often more stringent than NAAQS.

Approval, funding, or implementation of Federal Highway Administration and Federal Transit Administration projects is subject to the transportation conformity regulations under the CAA (40 CFR 93 Subpart A). The Eastside Transit Corridor Phase 2 Project is included in the Southern California Association of Government's (SCAG) *2012-2035 Regional Transportation Plan /Sustainable Communities Strategy* (RTP/SCS) adopted on April 4, 2012. The proposed project is therefore classified as a conforming project under transportation conformity, and a regional analysis of projects emissions is not required. Additionally, the SCAG Transportation Conformity Working Group (TCWG) determined that the project is not a project of air quality concern and does not require project-level PM hot spot analyses for PM_{10}, and $PM_{2.5}$; however, analysis regarding possible localized impacts of CO is still required.

4.7.1.2 Significance Thresholds

4.7.1.2.1 Federal

A project's air quality impacts are considered significant under the CAA if project emissions cause or contribute to ambient air concentrations that exceed a NAAQS. Project emissions are defined as the increment between a future alternative and a future no action alternative. If project emissions do not exceed these thresholds, then it would indicate that the project would not cause or contribute to emission levels that exceed a NAAQS; thus, emissions would not be significant under the CAA.

4.7.1.2.2 State

The South Coast Air Quality Management District (SCAQMD) developed significance thresholds for mass daily emission rates of criteria pollutants for both construction and operational sources. **Table 4.7-1** summarizes the mass daily significance thresholds published by the SCAQMD and used in this analysis.

Table 4.7-1. SCAQMD Air Quality Significance Thresholds (lbs/day)

Pollutant	Construction	Operation
NOx	100	55
VOC*	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SOx	150	150
CO	550	550
Lead	3	3

*Volatile organic compounds

The *CEQA Guidelines* provide only qualitative criteria to evaluate significance. Since the SCAQMD publishes quantitative significance thresholds, these are suitable for evaluating compliance with the Initial Study checklist questions contained in the *CEQA Guidelines*.

Concentrations from the CO hot spots analysis are compared with the NAAQS and CAAQS to evaluate significance. As a result, the significance thresholds for localized CO concentrations are 9 parts per million (ppm) for the 8-hour averaging period (NAAQS and CAAQS), 20 ppm for the 1-hour CAAQS, and 35 ppm for the 1-hour NAAQS.

Project emissions for this CEQA analysis are defined as the difference between a project alternative (2035) and the existing conditions in 2010 adjusted for regional growth that would occur by 2035. For the Eastside Transit Corridor Phase 2 Project, this adjusted baseline is equivalent to the No Build Alternative (2035). The build alternatives plus existing conditions (i.e., the alternative as it would exist in 2010) were also compared with existing conditions (2010) and are discussed further in the "Comparison of Alternative Against Existing Conditions" subsections. Project emissions greater than thresholds for a given air pollutant would be considered a significant impact under CEQA.

4.7.1.3 Methodology

4.7.1.3.1 Regional Operational Emissions

Regional emissions were calculated from projected vehicle miles traveled (VMT) for each of the project alternatives. Regional VMT data was estimated from the latest version of the Los Angeles County Metro's regional travel demand forecasting model (Metro Travel Demand Model). This analysis used the current USEPA-approved version of the emissions factors model (EMFAC) to develop emission factors for different vehicle classes. EMFAC was also used to describe the on-road fleet mix (the relative ratio of passenger cars, buses, delivery trucks, heavy duty diesel trucks, motorcycles, recreational vehicles, etc.) for the South Coast Air Basin (SoCAB) in each year of the analysis.

The build alternatives would include the addition of parking spaces to accommodate passengers at several of the stations. The new parking spaces would result in a new source of volatile organic compounds (VOC) emissions, namely evaporative leaks from vehicle fuel tanks. Evaporative emissions from vehicles left in the parking lots throughout the day were also estimated with EMFAC.

Emission factors for urban buses from EMFAC were also used to estimate emissions from changes in transit buses. Any potential increases in criteria pollutants from fossil fuels used to generate electricity used to power the electric light rail transit (LRT) vehicles would not contribute to impacts under the significance thresholds. Impacts from criteria pollutants tend to be localized in nature and the exact power plant from which emissions would occur cannot be identified. As a result, it would be speculative to assume that emissions would occur in the SoCAB and would contribute to a local or regional impact from criteria pollutants.

4.7.1.3.2 CO Hot Spots

Localized concentrations of CO that can occur near roadway intersections from changes in traffic volume, speed, and delay are known as CO hot spots. As explained above, an evaluation of localized impacts is focused on CO because an evaluation of PM_{10} or $PM_{2.5}$ is neither required nor deemed necessary by SCAG TCWG. To determine whether a CO hot spot (high localized ambient concentration) would result from activities associated with the proposed project, an analysis must be conducted to predict ambient CO concentrations from the near-field dispersion of the emissions. The screening procedures in the Bay Area Air Quality Management District *CEQA Guidelines* (1999) and emission factors from EMFAC were used to estimate localized impacts from CO for the following five intersections which have the highest peak hour traffic volumes:

- Washington Boulevard and Rosemead Boulevard
- Washington Boulevard and Pioneer Boulevard
- Washington Boulevard and Norwalk Boulevard
- Washington Boulevard and Paramount Boulevard
- Washington Boulevard and Passons Boulevard

Because these intersections would not be affected by the SR 60 LRT Alternative, the intersection in the vicinity of the SR 60 LRT Alternative alignment with the worst traffic volume (Garfield Avenue and Via Campo) was also analyzed. Additional information on the CO hot spots analysis is provided in Appendix R, Air Quality Impacts and Health Risk Assessment Technical Memorandum.

4.7.1.3.3 Health Risk Assessment

CEQA requires an analysis of the health impacts associated with a proposed project, which may include a health risk assessment (HRA) for sensitive receptors (e.g., residents, workers, and school children) near the project site that are likely to be exposed to toxic air contaminants (TACs) emitted from project activities. TACs can cause cancer or non-cancerous health effects including asthma, nervous system disorders, birth defects, and developmental issues in children. Most TACs are categorized as organic (primarily volatile) or inorganic (primarily particulate) emissions. Therefore, emissions of TACs are typically calculated by applying chemical-specific mass fractions (also called speciation profiles) to the total organic gases (TOG) or PM_{10} emission rates calculated for criteria pollutant emission inventories.

The California Air Resources Board (CARB) has developed speciation profiles (CARB 2010b) for a variety of sources including diesel and gasoline motor vehicles, off-road diesel and gasoline mobile equipment, paved road dust, and construction dust. These speciation profiles were used with projected TOG and PM_{10} emission levels to determine TAC emissions for each alternative.

SCAQMD Rule 1401 was used to determine the TACs to be evaluated for risk. Twenty-five TACs were identified from the speciation profiles for mobile emission sources. Common TACs from mobile sources include benzene, 1,3-butadiene, formaldehyde, acrolein, and diesel particulate matter (DPM). This analysis calculated speciated emissions for exhaust, evaporation, tire wear, brake wear, and paved road dust.

Additional information on TAC emissions and the results of any HRAs that were completed are included in the following discussions for each alternative.

4.7.2 Affected Environment/Existing Conditions

Table 4.7-2 provides a summary of regional highway traffic emissions in the project area and transit bus operations for existing conditions.

The regional traffic emissions are based on modeling that considered freeway mainline traffic in the six-county region covered by the Southern California Association of Governments, including Los Angeles, Orange, Riverside, San Bernardino, Imperial, and Ventura counties.

Table 4.7-2. Existing Conditions (2010) Total Operational Emissions: Regional Traffic and Transit Buses

Emission Source	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)					
Regional Traffic	96,360	2,356,768	460,963	3,790	285,408	83,149
Transit Buses	47	340	767	1	64	31
Total	96,407	2,357,108	461,731	3,947	285,473	83,180
Annual Emissions (tpy)						
Regional Traffic	15,321	374,726	73,293	603	45,380	13,221
Transit Buses	8	54	122	<1	10	5
Total	15,329	374,780	73,416	628	45,390	13,226

Source: CDM Smith 2013.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

The transit bus VMT is based on the study area described in Appendix R, Air Quality Impacts and Health Risk Assessment Technical Memorandum, and is a subset of Los Angeles County. The transit bus VMT is not a sub-category of the regional traffic emissions, but was estimated separately.

The CAA specifies dates for achieving compliance with NAAQS and regions are designated according to their compliance status. A nonattainment designation means that the area is not in compliance with the NAAQS. A maintenance designation means a pollutant was previously in nonattainment but was subsequently redesignated as in attainment.

The SoCAB is designated as a federal nonattainment area for O_3, $PM_{2.5}$, and Pb. Nonattainment designations may be classified in levels of severity based on the pollutant concentration levels that determine the mandated attainment date. The region is classified as an extreme nonattainment area for O_3 and a serious nonattainment area for PM_{10}. In 1998 the USEPA designated the SoCAB as an attainment/maintenance area for NO_2 because NO_2 levels in SoCAB dropped below NAAQS in the early 1990s. The USEPA designated SoCAB as a maintenance area for CO in 2007 and PM_{10} in 2013.

The SoCAB is designated as a state nonattainment area for O_3, NO_2, PM_{10}, $PM_{2.5}$, and Pb. (Refer to Appendix R, Air Quality Impacts and Health Risk Assessment Technical Memorandum, for a more detailed discussion of the region's attainment status.)

4.7.3 Environmental Impacts/Environmental Consequences

This section describes the results of the construction and operational air quality impact analysis conducted for the proposed Eastside Transit Corridor Phase 2 Project. Construction and operational emissions would occur at different times and would not overlap; therefore, emissions would not be cumulative and are reported separately.

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.

More detailed emission calculations and model outputs can be found in Appendix R, Air Quality Impacts and Health Risk Assessment Technical Memorandum, of this Draft EIS/EIR. **Table 4.7-3**, below, summarizes the operational air quality impacts for each of the project alternatives.

Table 4.7-3. Summary of Potential Air Quality Impacts

Alternative	Construction (NEPA/CEQA)	Operations (NEPA/CEQA)
No Build	None	None
TSM	Not adverse/Less than significant	Not adverse/Less than significant
SR 60 LRT[1]	Not adverse/Less than significant after mitigation	Not adverse/Less than significant
Washington Boulevard LRT	Not adverse/Less than significant after mitigation	Not adverse/Less than significant

Notes:
[1] Includes the SR 60 North Side Design Variation.

4.7.3.1 No Build Alternative

4.7.3.1.1 Impact Analysis

The No Build Alternative assumes that none of the project alternatives would be built. The No Build Alternative would not create new emissions as it only reflects regional growth in the area, and would not have negative operational air quality impacts. Operational emissions would occur from exhaust emissions associated with regional traffic and buses. **Table 4.7-4** summarizes regional highway traffic and transit bus emissions in the project area. Although there may be more congestion and vehicle miles traveled in 2035 than in 2010, improvements in engine technology, turnover in older vehicles, and stricter exhaust emission factors often result in lower emissions in future years. As a result, emissions in Table 4.7-4 are lower than under the existing conditions shown in Table 4.7-2. As described in Section 4.7.1.2.2, the No Build Alternative is equivalent to an adjusted environmental baseline and is used to evaluate the significance of the alternatives under CEQA and NEPA.

Emissions of TACs from highway vehicles would also occur under the No Build Alternative. Depending on the TAC, emissions range from 1 to 183 pounds per hour for volatile organic compounds and less than 37 pounds per hour for inorganic compounds. Emissions are summarized in Appendix R, Air Quality Impacts and Health Risk Assessment Technical Memorandum, of this Draft EIS/EIR.

This analysis included a CO hot spots evaluation that calculated localized impacts of CO concentrations at several intersections.

Table 4.7-4. No Build Alternative (2035) Total Operational Emissions: Regional Traffic and Transit Buses

Emission Source	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)					
Regional Traffic	52,574	1,105,509	256,322	5,774	413,652	117,223
Transit Buses	16	103	280	1	55	24
Total	52,590	1,105,612	256,602	5,775	413,707	117,246
Annual Emissions (tpy)						
Regional Traffic	8,359	175,776	40,755	918	65,771	18,638
Transit Buses	3	16	45	<1	9	4
Total	8,362	175,792	40,800	918	65,779	18,642

Source: CDM Smith 2013.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

The maximum CO concentrations at each of the intersections would not exceed the established thresholds (equal to the NAAQS and CAAQS) and would be less than significant.

4.7.3.1.2 Mitigation Measures

Since the No Build Alternative would not result in significant air quality impacts, no mitigation measures are required.

4.7.3.1.3 Impacts Remaining After Mitigation

NEPA Finding

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

CEQA Determination

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

4.7.3.2 TSM Alternative

4.7.3.2.1 Impact Analysis

Construction Impacts

The TSM Alternative would involve minimal construction to add new bus stops, shelters, and other related facilities. As a result, emissions associated with construction would be negligible and were not quantified.

Operational Impacts

The TSM Alternative would improve mobility in the region, but without the construction of a fixed guideway facility.

The TSM Alternative would therefore result in an increase in bus mileage in comparison with the No Build Alternative, but would lead to a corresponding reduction in regional traffic from passengers changing transportation modes. In other words, it is expected that some drivers using single occupancy vehicles would switch to transit with the proposed improvements to public transportation.

Emissions from operation of buses associated with the TSM Alternative were considered together with highway emissions. **Table 4.7-5** shows total regional operational emissions under the TSM Alternative.

As shown in Table 4.7-5, emissions of all pollutants would decrease with implementation of the TSM Alternative.

Table 4.7-5. TSM Alternative (2035) Total Operational Emissions: Regional Traffic and Transit Buses

Emission Source	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)[1]					
Regional Traffic	52,526	1,104,492	256,086	5,768	413,271	117,115
Transit Buses	24	154	419	1	83	35
Total Emissions	52,549	1,104,646	256,506	5,770	413,354	117,150
Increment Above No Build Alternative[2]	(41)	(966)	(96)	(5)	(353)	(96)
CEQA Threshold	55	150	55	550	150	55
Significant?	No	No	No	No	No	No
Annual Emissions (tpy)[1]						
Regional Traffic	8,352	175,614	40,718	917	65,710	18,621
Transit Buses	4	25	67	<1	13	6
Total Emissions	8,355	175,639	40,785	917	65,723	18,627
Increment Above No Build Alternative	(6)	(154)	(15)	(1)	(56)	(15)
NEPA Threshold	10	100	10	100	100	100
Adverse?	No	No	No	No	No	No

Source: CDM Smith 2013.
Notes:
[1] Emission reductions (beneficial impacts) are shown in parentheses.
[2] For the purpose of this analysis, the "adjusted environmental baseline," which is defined as the existing conditions in 2010 adjusted for regional growth that would occur by 2035, was equivalent to the No Build Alternative (2035). As a result, the table uses the No Build Alternative to analyze impacts under CEQA.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

The TSM Alternative would result in emissions of TACs from regional traffic operations. This alternative would result in decreased TAC emissions from highway vehicles compared with the No Build Alternatives; therefore, no HRA was completed for operational emissions.

A CO hot spots evaluation was completed to calculate localized impacts of CO concentrations at several intersections. According to the analysis completed, the maximum CO concentrations at each of the intersections would not exceed the established thresholds for both the CAA and CEQA.

4.7.3.2.2 Mitigation Measures

Construction Mitigation Measures

Since construction-related emissions would be negligible, no mitigation measures are required.

Operational Mitigation Measures

Since the TSM Alternative would not result in significant air quality impacts from its operation, no mitigation measures are required.

4.7.3.2.3 Impacts Remaining After Mitigation

NEPA Finding

Since the TSM Alternative is expected to involve only minimal construction activities, emissions from those activities are expected to be negligible and were not quantified. Construction-related air quality effects would not be adverse under NEPA.

All criteria pollutant emissions from operations, including TAC emissions and the CO hot spots locations, would not be adverse.

CEQA Determination

Since the TSM Alternative is expected to involve only minimal construction activities, emissions from those activities are expected to be negligible and were not quantified. Construction-related air quality impacts are expected to be less than significant.

Operational emissions for the TSM Alternative, including both the operation of buses and regional traffic, would be less than significant. The CO hot spots analysis under the TSM Alternative was also found to be less than significant.

4.7.3.3 SR 60 LRT Alternative

4.7.3.3.1 Impact Analysis

Construction Impacts

SCAQMD requires an analysis of construction-related emissions. This analysis estimated emissions from off-road construction equipment, fugitive dust, construction worker commuting vehicles, and haul trucks. **Table 4.7-6** shows construction emissions by peak day of operation for the SR 60 LRT Alternative. All phases of construction, including street widening and construction of the elevated guideway, stations, parking facilities, and Mission Junction maintenance yard, are included in the totals shown in Table 4.7-6. Emissions of VOC, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$ would not be significant, and no mitigation measures would need to be implemented.

This analysis also evaluated construction emissions on a local level and compared them with SCAQMD's localized significance thresholds (LSTs). The analysis used a series of look-up tables for NOx, CO, PM_{10}, and $PM_{2.5}$.

These tables show maximum allowable emission levels, which vary based on project location, size (acreage), and distance to the nearest receptor. Emissions were compared with the LSTs for the South San Gabriel Valley Source Receptor Area (SRA).

The LST evaluation indicates that PM_{10} emissions would be greater than maximum allowable levels during construction of the maintenance yard. Impacts of PM_{10} would have to be mitigated to the maximum extent feasible. Appendix R, Air Quality Impacts and Health Risk Assessment, contains a more detailed analysis of construction-related emissions.

Construction of the SR 60 LRT Alternative would indirectly result in increased emissions of TACs. Projected emissions under the SR 60 LRT Alternative were compared with those under the No Build Alternative (2035) for CEQA analysis. The analysis includes a Tier 1 HRA, which compares emission levels to published screening limits. The pollutant screening index (PSI) for each pollutant is calculated by dividing the maximum annual and hourly emissions of each pollutant by the pollutant screening level (PSL) for the given pollutant.

Table 4.7-6. SR 60 LRT Alternative (2027-2030) Maximum Daily Construction Emissions

	Daily Emissions (lbs/day)					
	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Emissions	66	59	150	<1	25	10
Threshold	75	100	550	150	150	55
Significant	No	No	No	No	No	No

Source: CDM Smith 2013.
Notes: Excavation of 83 cubic yards within the Whittier Narrows Flood Control Basin as part of compensatory mitigation for the SR 60 LRT Alternative would result in five truck trips. Given that the soil would be used on a nearby segment of the alignment outside the Whittier Narrows Flood Control Basin, the additional five truck trips would result in minimal emissions and would not result in an increase in maximum daily construction emissions that would exceed air quality thresholds.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

The PSLs are published by the SCAQMD and are emission thresholds that are not expected to exceed the various risk levels. The summation of the PSIs for all pollutants is known as the application screening index (ASI); if the ASI is less than 1, then the emissions source is compliant with the SCAQMD's risk thresholds.

Table 4.7-7 summarizes project-related emissions and Tier 1 HRA results. As shown in Table 4.7-7, the ASI is less than the threshold of 1; therefore, impacts from construction-related TAC emissions under the SR 60 LRT Alternative would not be significant under CEQA.

Operational Impacts

Operational emissions associated with the SR 60 LRT Alternative include emissions from highway traffic, transit buses, a light rail maintenance yard, and parking lots. The SR 60 LRT Alternative would provide an alternative to automobile transportation in the region; therefore, it was necessary to evaluate highway traffic to assess how the SR 60 LRT Alternative would increase or decrease operational emissions from highway vehicles.

Table 4.7-8 summarizes exhaust emissions from regional highway traffic and transit buses, evaporative loss emissions from parking lots, and operational emissions from the LRT maintenance yard in the project area. This table compares emissions associated with the SR 60 LRT Alternative with the adjusted environmental baseline (No Build Alternative) for CEQA.

Criteria pollutant emissions would be less than significant under the SR 60 LRT Alternative, when compared with the adjusted environmental baseline. Although emissions from transit buses would increase compared to the No Build Alternative, highway emissions are expected to decrease which would counteract the transit bus emissions.

Table 4.7-7. SR 60 LRT Alternative (2027-2030) Construction Health Risk Assessment

TAC	CAS #	Emissions (lbs/hr)	PSL (lbs/hr)	PSI
Arsenic	7440-38-2	0.0000079	0.00010	0.079
Chlorine	7782-50-5	0.0013	0.1	0.013
Copper	7440-50-8	0.000045	0.050	0.00090
Mercury	7439-97-6	0.0000089	0.00090	0.010
Nickel	7440-02-0	0.000025	0.0030	0.0084
ASI				0.11
Threshold				1

Source: CDM Smith 2013
Key:
ASI = application screening index (total PSI)
CAS = Chemical Abstracts Service
lbs/hr = pounds per hour
PSI = pollutant screening index (PSL divided by project emissions)
PSL = pollutant screening level (minimum level expected to exceed health risk)
TAC = toxic air contaminant

Table 4.7-8. SR 60 LRT Alternative (2035) Total Operational Emissions: Regional Traffic, Parking Lot Evaporative Emissions, Transit Buses, and LRT Maintenance Yard

Emission Source	VOC	CO	NOx	SO2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)[1]					
Regional Traffic	52,524	1,104,458	256,079	5,768	413,259	117,111
Parking	4	N/A	N/A	N/A	N/A	N/A
Transit Buses	22	145	396	1	78	33
LRT Maintenance Yard	3	31	5	<1	6	1
Total Emissions	52,554	1,104,634	256,479	5,769	413,343	117,146
Increment Above No Build Alternative[2]	(36)	(977)	(123)	(5)	(364)	(101)
CEQA Threshold	55	550	55	150	150	55
Significant?	No	No	No	No	No	No

Table 4.7-8. SR 60 LRT Alternative (2035) Total Operational Emissions: Regional Traffic, Parking Lot Evaporative Emissions, Transit Buses, and LRT Maintenance Yard (Continued)

Emission Source	VOC	CO	NOx	SO2	PM_{10}	$PM_{2.5}$
Annual Emissions (tpy)[1]	Daily Emissions (lbs/day)[1]					
Regional Traffic	8,351	175,609	40,716	917	65,708	18,621
Parking	<1	N/A	N/A	N/A	N/A	N/A
Transit Buses	4	23	63	0	13	5
LRT Maintenance Yard	<1	6	<1	<1	1	<1
Total Emissions	8,356	175,638	40,781	917	65,722	18,626
Increment Above No Build Alternative	(6)	(155)	(19)	(<1)	(58)	(16)
CAA Threshold	10	100	10	100	100	100
Adverse?	No	No	No	No	No	No

Source: CDM 2013.
Notes:
[1] Emission reductions (beneficial impacts) are shown in parentheses.
[2] For the purpose of this analysis, the "adjusted environmental baseline," which is defined as the existing conditions in 2010 adjusted for regional growth that would occur by 2035, was equivalent to the No Build Alternative (2035). As a result, the table uses the No Build Alternative to analyze impacts under CEQA.

Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

The SR 60 LRT Alternative would result in emissions of TACs from regional traffic operation. Emissions from the maintenance yard and parking lots would be negligible. The SR 60 LRT Alternative would indirectly result in decreased TAC emissions from highway vehicles compared with the No Build Alternative; therefore, an HRA was not completed for operational emissions.

This analysis included a CO hot spots evaluation to calculate localized impacts of CO concentrations at several intersections. The intersection with the highest potential for adverse impacts from the SR 60 LRT Alternative, based on peak hourly traffic volume, was selected for a screening analysis. The maximum CO concentrations at this intersection (Garfield Avenue and Via Campo) would not exceed the established thresholds under either NEPA or CEQA.

An evaluation was also completed to compare the SR 60 LRT Alternative plus existing conditions to existing conditions only, as upheld by the Sunnyvale CEQA decision. **Table 4.7-9** compares emissions from the SR 60 LRT Alternative (as if it had been built in 2010) with existing conditions in 2010.

Table 4.7-9. SR 60 LRT Alternative Daily Operational Emissions as Built in 2010 Compared to Existing Conditions (2010)

Pollutant	Daily Emissions[1,2] (lbs/day)				
	Existing Conditions[3]	SR 60 LRT Alternative[4]	Incremental Emissions	Significance Threshold	Exceed Threshold?
VOC	96,360	24,602	(71,805)	55	No
CO	2,356,768	651,625	(1,705,483)	550	No
NOx	460,963	121,526	(340,205)	55	No
SO_2	3,946	3,946	(2)	150	No
PM_{10}	285,408	280,585	(4,888)	150	No
$PM_{2.5}$	83,149	78,188	(4,992)	55	No

Source: SCAQMD 2011
Notes:
[1] Incremental emissions are determined by subtracting the existing emissions from project emissions.
[2] Emission reductions (beneficial impacts) are shown in parentheses.
[3] Emission factors used in analysis were based on 2010 conditions for Existing Conditions.
[4] Emission factors used in analysis were based on 2035 for future build alternatives based on the year that the proposed project would be operational.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
PM_{10} = inhalable particulate matter
$PM_{2.5}$ = fine particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

As shown in Table 4.7-9, daily incremental operational emissions associated with the SR 60 LRT Alternative would decrease for all pollutants; thus, all operational emission impacts would be less than significant under CEQA.

4.7.3.3.2 Mitigation Measures

Construction Mitigation Measures

4.7-i. Chemical soil stabilization measures would be implemented by the construction contractor.

4.7-ii. Ground cover in disturbed areas quickly would be replaced quickly by the construction contractor.

4.7-iii. A minimum soil moisture of 12 percent would be maintained by the construction contractor during any equipment loading and unloading activities to control fugitive dust.

The SCAQMD *2003 Air Quality Management Plan* identifies control measures for further emission reductions from fugitive dust sources. One such measure, Control Measure BCM-07, specifically identifies water, chemical stabilization, paving, revegetation, track-out control, and construction project signage as recommended control measures. The mitigation measures identified above would be consistent with Control Measure BCM-07 and thus consistent with the SCAQMD 2003 Air Quality Management Plan. As required by SCAQMD Rule 403, the proposed project would incorporate these

and any other specific dust control measures identified in Rule 403.

Operational Mitigation Measures

Since operation of the SR 60 LRT Alternative would not result in significant air quality impacts, no mitigation measures are required.

4.7.3.3.3 Impacts Remaining After Mitigation

NEPA Finding

Unmitigated regional construction emissions for the SR 60 LRT Alternative would not be adverse under NEPA and therefore no mitigation is required.

Criteria pollutant emissions from operations, including TAC emissions and the CO hot spots, would not be adverse.

CEQA Determination

Regional construction emissions for the SR 60 LRT Alternative would exceed the PM_{10} LST for the Mission Junction maintenance yard option. Mitigation measures, including additional fugitive dust control measures, are expected to reduce emissions to less than significant.

Operational emissions of criteria pollutants, including CO hot spots, would be less than significant when compared with the adjusted environmental baseline (No Build Alternative).

As TAC emissions would be less than those under the No Build Alternative, no HRA was required.

Comparison of Alternative Against Existing Conditions

Operational emissions for all pollutants, including pollutants from regional highway traffic, transit buses, parking lots, and a light rail maintenance yard, would be less than those calculated for existing conditions. Emissions would be less than significant for the SR 60 LRT Alternative and no mitigation measures would be required. Additional information is provided in Appendix GG, Existing Plus Project Conditions.

4.7.3.4 Washington Boulevard LRT Alternative

4.7.3.4.1 Impact Analysis

Construction Impacts

SCAQMD requires an analysis of construction-related emissions. This analysis estimated emissions from off-road construction equipment, fugitive dust, construction worker commuting vehicles, and haul trucks. **Tables 4.7-10** through **4.7-12** show construction emissions by peak day of operation. All phases of construction, including street widening and construction of the elevated guideway, parking facilities, and a maintenance yard are included in the totals shown in Tables 4.7-10 through 4.7-12. Since the Washington Boulevard LRT Alternative includes three options for the maintenance yard (Mission Junction, Commerce, and Santa Fe Springs), each table shows cumulative emissions for one of the maintenance yard options.

Daily criteria pollutant emissions from construction activities would not be significant for any of the maintenance yard scenarios and no mitigation measures would need to be implemented.

The LST evaluation indicates that PM_{10} emissions would be greater than maximum allowable levels during construction of the Mission Junction maintenance yard. Impacts of PM_{10} would have to be mitigated to the maximum extent feasible. If one of the other maintenance yard options (Commerce or Santa Fe Springs) is selected instead of the Mission Junction yard option, then PM_{10} emissions would be less than significant because a smaller area would need to be graded and improved.

Construction of the Washington Boulevard LRT Alternative would indirectly result in increased emissions of TACs. Projected emissions under the Washington Boulevard LRT Alternative were compared with the No Build Alternative for CEQA analysis. The analysis includes a Tier 1 HRA, which compares emission levels to published screening limits.

Table 4.7-10. Washington Boulevard LRT Alternative (2027-2031) with Santa Fe Springs Maintenance Yard Option Maximum Daily Construction Emissions

	Daily Emissions (lbs/day)					
	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Emissions	52	78	157	<1	26	9
Threshold	75	100	550	150	150	55
Significant	No	No	No	No	No	No

Source: CDM Smith 2013
Note:
Emissions shown include all phases of construction, including street widening and construction of the elevated guideway, stations, parking facilities, and the Santa Fe Springs (nine-acre) yard option. The emissions shown do not represent emissions from only the maintenance yard.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Table 4.7-11. Washington Boulevard LRT Alternative (2027-2031) with Commerce Maintenance Yard Option Maximum Daily Construction Emissions

	Daily Emissions (lbs/day)					
	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Emissions	67	78	157	<1	26	9
Threshold	75	100	550	150	150	55
Significant	No	No	No	No	No	No

Source: CDM Smith 2013
Note:
Emissions shown include all phases of construction, including street widening and construction of the elevated guideway, stations, parking facilities, and the Commerce (12-acre) yard option. The emissions shown do not represent emissions from only the maintenance yard.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
PM2.5 = fine particulate matter
PM10 = inhalable particulate matter
SO2 = sulfur dioxide
VOC = volatile organic compounds

Table 4.7-12. Washington Boulevard LRT Alternative (2027-2031) with Mission Junction Maintenance Yard Option Maximum Daily Construction Emissions

	Daily Emissions (lbs/day)					
	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Emissions	62	78	157	<1	26	9
Threshold	75	100	550	150	150	55
Significant	No	No	No	No	No	No

Source: CDM Smith 2013
Note:
Emissions shown include all phases of construction, including street widening and construction of the elevated guideway, stations, parking facilities, and the Mission Junction (11-acre) yard option. The emissions shown do not represent emissions from only the maintenance yard.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Tables 4.7-13 through **4.7-15** summarize project-related emissions and Tier 1 HRA results under each of the maintenance yard options. In each case the ASI is less than the risk threshold of 1; therefore, impacts from construction TAC emissions under the Washington Boulevard LRT Alternative would not be significant under CEQA.

Operational Impacts

Operational emissions associated with the Washington Boulevard LRT Alternative include emissions from highway traffic, transit buses, a light rail maintenance yard, and parking lots. The Washington Boulevard LRT Alternative would provide an alternative to automobile transportation in the region; therefore, it was necessary to evaluate highway traffic to assess how the Washington Boulevard LRT Alternative would increase or decrease operational emissions from passenger vehicles.

Table 4.7-16 summarizes exhaust emissions from regional highway traffic and transit buses, evaporative loss emissions from parking lots, and operational emissions from the LRT maintenance yard in the project area. The table compares emissions associated with the Washington Boulevard LRT Alternative with the adjusted environmental baseline (No Build Alternative) for CEQA.

When compared with the adjusted environmental baseline, all criteria pollutant emissions under the Washington Boulevard LRT Alternative would be less than significant. Although emissions from transit buses would be higher than those under the No Build Alternative, highway emissions are expected to decrease which would counteract the bus emissions.

Table 4.7-13. Washington Boulevard LRT Alternative with the Santa Fe Springs Maintenance Yard (2027-2031) Construction Health Risk Assessment

TAC	CAS #	Emissions (lbs/hr)	PSL (lbs/hr)	PSI
Arsenic	7440-38-2	0.0000073	0.00010	0.073
Chlorine	7782-50-5	0.0013	0.11	0.012
Copper	7440-50-8	0.000042	0.050	0.00084
Mercury	7439-97-6	0.0000066	0.00090	0.0073
Nickel	7440-02-0	0.000023	0.0030	0.0078
ASI				0.10
Threshold				1

Source: CDM Smith 2013
Key:
ASI = application screening index (total PSI)
CAS = Chemical Abstracts Service
lbs/hr = pounds per hour
PSI = pollutant screening index (PSL divided by project emissions)
PSL = pollutant screening level (minimum level expected to exceed health risk)
TAC = toxic air contaminant

Table 4.7-14. Washington Boulevard LRT Alternative with the Commerce Maintenance Yard (2027-2031) Construction Health Risk Assessment

TAC	CAS #	Emissions (lbs/hr)	PSL (lbs/hr)	PSI
Arsenic	7440-38-2	0.0000074	0.00010	0.074
Chlorine	7782-50-5	0.0013	0.11	0.012
Copper	7440-50-8	0.000042	0.050	0.00085
Mercury	7439-97-6	0.0000067	0.00090	0.0074
Nickel	7440-02-0	0.000023	0.0030	0.0078
ASI				0.10
Threshold				1

Source: CDM Smith 2013
Key:
ASI = application screening index (total PSI)
CAS = Chemical Abstracts Service
lbs/hr = pounds per hour
PSI = pollutant screening index (PSL divided by project emissions)
PSL = pollutant screening level (minimum level expected to exceed health risk)
TAC = toxic air contaminant

Table 4.7-15. Washington Boulevard LRT Alternative with the Mission Junction Maintenance Yard (2027-2031) Construction Health Risk Assessment

TAC	CAS #	Emissions (lbs/hr)	PSL (lbs/hr)	PSI
Arsenic	7440-38-2	0.0000074	0.0001	0.074
Chlorine	7782-50-5	0.0013	0.105	0.012
Copper	7440-50-8	0.000042	0.05	0.00085
Mercury	7439-97-6	0.0000067	0.0009	0.0074
Nickel	7440-02-0	0.000023	0.0030	0.0078
ASI				0.10
Threshold				1

Source: CDM Smith 2013
Key:
ASI = application screening index (total PSI)
CAS = Chemical Abstracts Service
lbs/hr = pounds per hour
PSI = pollutant screening index (PSL divided by project emissions)
PSL = pollutant screening level (minimum level expected to exceed health risk)
TAC = toxic air contaminant

Table 4.7-16. Washington Boulevard LRT Alternative (2035) Total Operational Emissions: Regional Traffic, Parking Lot Evaporative Emissions, Transit Buses, and LRT Maintenance Yard

Emission Source	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)[1]					
Regional Traffic	52,524	1,104,456	256,078	5,768	413,258	117,111
Parking	3	N/A	N/A	N/A	N/A	N/A
Transit Buses	23	150	409	1	81	35
LRT Maintenance Yard	3	31	5	<1	6	1
Total Emissions	52,554	1,104,637	256,492	5,770	413,345	117,147
Increment Above No Build Alternative[2]	(36)	(974)	(110)	(5)	(363)	(100)
CEQA Threshold	55	550	55	150	150	55
Significant?	No	No	No	No	No	No

Table 4.7-16. Washington Boulevard LRT Alternative (2035) Total Operational Emissions: Regional Traffic, Parking Lot Evaporative Emissions, Transit Buses, and LRT Maintenance Yard(Continued)

Emission Source	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
	Daily Emissions (lbs/day)[1]					
Annual Emissions (tpy)[1]						
Regional Traffic	8,351	175,608	40,716	917	65,708	18,621
Parking	1	N/A	N/A	N/A	N/A	N/A
Transit Buses	4	24	65	<1	13	6
LRT Maintenance Yard	<1	6	<1	<1	1	<1
Total Emissions	8,356	175,638	40,783	917	65,722	18,626
Increment Above No Build Alternative	(6)	(154)	(17)	(1)	(57)	(16)
CAA Threshold	10	100	10	100	100	100
Adverse?	No	No	No	No	No	No

Source: CDM Smith 2013
Notes:
[1] Emission reductions (beneficial impacts) are shown in parentheses.
[2] For the purpose of this analysis, the "adjusted environmental baseline," which is defined as the existing conditions in 2010 adjusted for regional growth that would occur by 2035, was equivalent to the No Build Alternative (2035). As a result, the table uses the No Build Alternative to analyze impacts under CEQA.

Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = inhalable particulate matter
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

The Washington Boulevard LRT Alternative would result in emissions of TACs from regional traffic operations. Emissions from the maintenance yard and parking lots would be negligible. The Washington Boulevard LRT Alternative would indirectly result in decreased TAC emissions from highway vehicles compared with the No Build Alternative; therefore, no HRA was completed for operational emissions.

This analysis includes a CO hot spots evaluation that calculated localized impacts of CO concentrations at several intersections. The five intersections with the highest potential for adverse impacts, based on peak hourly volume, were selected for a screening analysis. The maximum CO concentrations at each of the intersections would not exceed the established thresholds and would be less than significant for both NEPA and CEQA.

An evaluation was also completed to compare the Washington Boulevard LRT Alternative plus existing conditions to existing conditions only, as upheld by the Sunnyvale CEQA decision. **Table 4.7-17** compares emissions from the Washington Boulevard Alternative, as if it had been built in 2010, with existing conditions in 2010.

Table 4.7-17. Washington Boulevard LRT Alternative Daily Operational Emissions as Built in 2010 Compared to Existing Conditions (2010)

Pollutant	Daily Emissions[1,2] (lbs/day)				
	Existing Conditions[3]	Washington Boulevard LRT Alternative[4]	Incremental Emissions	Significance Threshold	Exceed Threshold?
VOC	96,360	24,604	(71,803)	55	No
CO	2,356,768	651,689	(1,705,418)	550	No
NOx	460,963	121,550	(340,180)	55	No
SO_2	3,946	3,946	(1)	150	No
PM_{10}	285,408	280,613	(4,860)	150	No
$PM_{2.5}$	83,149	78,196	(4,984)	55	No

Source: SCAQMD 2011
Notes:
[1] Incremental emissions are determined by subtracting the project emissions from the existing emissions.
[2] Emission reductions (beneficial impacts) are shown in parentheses.
[3] Emission factors used in analysis were based on 2010 conditions for Existing Conditions.
[4] Emission factors used in analysis were based on 2035 for future build alternatives based on the year that the proposed project would be operational.
Key:
CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
PM_{10} = inhalable particulate matter
$PM_{2.5}$ = fine particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

As shown in Table 4.7-17, daily incremental operational emissions associated with the Washington Boulevard LRT Alternative would decrease for all pollutants; thus, all operational emission impacts are less than significant under CEQA.

4.7.3.4.2 Mitigation Measures

Construction Mitigation Measures

The same construction mitigation measures (mitigation measures 4.7-i through 4.7-iii) identified above in Section 4.7.3.3.2 for the SR 60 LRT Alternative and summarized in Table ES-2 would also apply to the Washington Boulevard LRT Alternative.

Operational Mitigation Measures

Since operation of the Washington Boulevard LRT Alternative would not result in significant air quality impacts, no mitigation measures are required.

4.7.3.4.3 Impacts Remaining After Mitigation

NEPA Finding

Unmitigated regional construction emissions from the Washington Boulevard LRT Alternative would not be adverse under NEPA and therefore no mitigation is required.

Criteria pollutant emissions from operations, including TAC emissions and the CO hot spots, would not be adverse.

CEQA Determination

Regional construction emissions from the Washington Boulevard LRT Alternative would exceed the PM_{10} LST for the Mission Junction maintenance yard option. Mitigation measures, including additional fugitive dust control measures, are expected to reduce emissions to less than significant.

Operational emissions for the Washington Boulevard LRT Alternative, including transit buses, a light rail maintenance yard, parking lots, and regional traffic, would be less than significant for CEQA when compared to the adjusted environmental baseline (No Build Alternative) missions of other pollutants, including CO hot spots, would be less than significant.

TAC emissions were less than those under the No Build Alternative and no HRA was required.

Comparison of Alternative Against Existing Conditions

Operational emissions, including regional highway traffic, transit buses, parking lots, and a light rail maintenance yard, for all pollutants would be less than those calculated for existing conditions. Emissions would be less than significant for the Washington Boulevard LRT Alternative and no mitigation measures would be required. Additional information is provided in Appendix GG, Existing Plus Project Conditions.