Section 4.8
Climate Change

This section summarizes the potential for climate change 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 Climate Change Technical Memorandum, which is incorporated into this Draft EIS/EIR as Appendix S.

4.8.1 Regulatory Framework/Methodology

4.8.1.1 Regulatory Framework

The Council on Environmental Quality (CEQ) published *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions* in February 2010. Although still only available as a draft, the CEQ recommended that federal agencies include greenhouse gas (GHG) emissions in a NEPA analysis if doing so would provide meaningful information to decision makers. The CEQ proposed using a limit of 25,000 metric tons of carbon dioxide equivalent (CO_2e) per year as an indicator that a quantitative assessment may be warranted. While CEQ has not finalized National Environmental Policy Act (NEPA)-specific requirements for GHG and climate change analyses, precedent for completing GHG analyses under NEPA has been established by the Federal Highway Administration (FHWA). In 2008, for example, FHWA published *Integrating Climate Change into the Transportation Planning Process*, which promotes the incorporation of climate change impacts in transportation planning. Furthermore, FHWA published *Climate Change – Model Language in Transportation Plans*, which provides advice to agencies seeking to incorporate climate change in lieu of federal guidance, in May 2010. The proposed project is a transit project that represents an alternative travel mode to single occupancy vehicles. As such, the project's ability to enable mode shift is part of the climate change solution and climate change effects are expected to be positive.

Several of the federal, state, and local regulations that were included as part of this analysis are summarized below. (Please refer to Appendix S, Climate Change Technical Memorandum, for more detailed information about these regulations.)

Federal

- Massachusetts et al. v. Environmental Protection Agency et al., which required the U.S. Environmental Protection Agency (USEPA) to regulate GHGs as a pollutant pursuant to the Federal Clean Air Act (CAA)
- Endangerment Finding (USEPA), which responds to the 2007 U.S. Supreme Court decision that GHGs fit within the CAA's definition of an air pollutant
- Greenhouse Gas and Fuel Efficiency Standards for Clean Vehicles by the USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA), in response to the U.S. Supreme Court's decision that GHGs should be regulated as air pollutants

State

- California Assembly Bill (AB) 1493
- California Executive Order S-3-05
- Global Warming Solutions Act of 2006 (AB 32)
- Senate Bill (SB) 97
- California Air Resources Board (CARB) Interim Significance Thresholds
- SB 375

- California Executive Order S-01-07 and the Low Carbon Fuel Standard (LCFS)

Local

- South Coast Air Quality Management District (SCAQMD) Guidelines and Regulations

4.8.1.2 CEQA Impact Criteria

California Environmental Quality Act (CEQA) guidance provided by SCAQMD and the California Natural Resources Agency requires the analysis of direct, indirect, and life-cycle GHG emissions that would occur during operation. The project emissions for this CEQA analysis were defined as the difference between a project alternative (2035) and the existing conditions in 2010 adjusted for regional growth (i.e., the adjusted environmental baseline) that would occur by 2035. The adjusted environmental 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). These are discussed further in the "Comparison of Alternative against Existing Conditions" subsections.

The SCAQMD interim thresholds are largely geared towards industrial, residential, and commercial projects and do not specifically address transportation projects. Since a transportation-specific threshold of significance for GHG emissions has not been established by SCAQMD, a quantitative threshold was not used to analyze the GHG emission impacts associated with the proposed project.

Significance was determined qualitatively by evaluating the project's compliance with the various regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

4.8.2 Affected Environment/Existing Conditions

As required by CEQA, existing (2010) emissions from regional traffic were estimated in the analysis for comparison with future build alternatives. Data on vehicle miles traveled (VMT) in the region and emission factors from the Emissions Factor (EMFAC) 2011 model were used to estimate emissions of GHG. The emissions calculations were based on the total VMT in the region and the average speed on the highway network, both of which were estimated based on the latest version of the Los Angeles County Metro's regional travel demand forecasting model (Metro Travel Demand Model). Since the EMFAC model only generates emissions of carbon dioxide (CO_2) and methane (CH_4), guidance on how to calculate nitrous oxide (N_2O) emissions found in the EMFAC frequently asked questions website as well as the California Climate Action Registry (CCAR) *General Reporting Protocol* were used to estimate emissions of N_2O. **Table 4.8-1** summarizes the GHG emissions from existing conditions.

4.8.3 Environmental Impacts/Environmental Consequences

Table 4.8-2 provides a summary of climate change impacts with respect to incremental GHG emissions as compared with existing conditions (2010) and with the No Build Alternative (2035). More detailed data is available in Appendix S, Climate Change Technical Memorandum, of this Draft EIS/EIR. In summary, the project would have a beneficial impact on climate change.

4.8.3.1 No Build Alternative

4.8.3.1.1 Impact Analysis

The No Build Alternative includes all of the projects that are identified for construction and implementation in the "Constrained Plan" of Metro's *2009 Long Range Transportation Plan* (through the year 2035). This plan includes the Metro Gold Line to East Los Angeles to the Atlantic

Table 4.8-1. Existing Conditions: 2010 Annual Regional Highway Traffic GHG Emissions

Source	CO_2	CH_4	N_2O	Total[1]
Vehicle Miles Traveled (VMT)	N/A	N/A	N/A	114,083,059,000
Emission Factor (grams per mile)	461	0.030	0.014	N/A
Emissions (metric tons per year)	52,580,504	3,410	1,612	N/A
Global Warming Potential[2]	1	21	310	N/A
CO_2e Emissions[3] (metric tons per year)	52,580,504	71,601	499,659	53,151,764

Source: CCAR 2009; EMFAC 2011.
Notes:
[1] Totals may vary due to rounding.
[2] Non-CO_2 pollutants have global warming potential (GWP) factors that reflect the degree to which these pollutants affect climate change, as compared to CO_2.
[3] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
Key:
CO_2 = carbon dioxide *CH_4 = methane* *N/A = not applicable*
CO_2e = carbon dioxide equivalent *GWP = Global Warming Potential* *N_2O = nitrous oxide*

Table 4.8-2. Summary of Climate Change Impacts

Alternative	Incremental GHG Emissions (metric tons CO_2e per year)[1,2]		Operations and Amortized Construction (NEPA/CEQA)
	Compared with Existing Conditions (2010)[3]	Compared with the No Build Alternative (2035)	
No Build	N/A	N/A	None
TSM	N/A	(65,410)	Not adverse/Less than significant
SR 60 LRT[1]	(17,646,969)	(61,810)	Not adverse/Less than significant
Washington Boulevard LRT[2]	(17,640,721)	(58,944)	Not adverse/Less than significant

Notes:
[1] Includes the SR 60 North Side Design Variation.
[2] Includes the aerial crossing options.

Station, but does not include any project resulting from this Phase 2 study effort. As a result, it represents a future condition where any changes from existing conditions would occur due to growth in regional traffic and planned service changes. GHG emissions associated with the operation of the light rail vehicles (LRV) for the proposed project would not occur under this alternative. Any future GHG emissions that would occur under this scenario are from projected growth in regional traffic. GHG emissions from regional highway traffic that would occur under the No Build Alternative are summarized in **Table 4.8-3**.

Table 4.8-3. No Build Alternative: 2035 Annual Regional Highway Traffic GHG Emissions

Source	CO_2	CH_4	N_2O	Total[1]
Vehicle Miles Traveled (VMT)	N/A	N/A	N/A	166,908,342,000
Emission Factor (grams per mile)	478	0.016	0.006	N/A
Emissions (metric tons per year)	79,823,405	2,725	1,038	N/A
Global Warming Potential[2]	1	21	310	N/A
CO_2e Emissions[3] (metric tons per year)	79,823,405	57,224	321,705	80,202,333

Source: CCAR 2009; EMFAC 2011.
Notes:
[1] Totals may vary due to rounding.
[2] Non-CO_2 pollutants have global warming potential (GWP) factors that reflect the degree to which these pollutants affect climate change, as compared to CO_2.
[3] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
Key:
CO_2 = carbon dioxide *CH_4 = methane* *N/A = not applicable*
CO_2e = carbon dioxide equivalent *GWP = Global Warming Potential* *N_2O = nitrous oxide*

4.8.3.1.2 Mitigation Measures

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

4.8.3.1.3 Impacts Remaining After Mitigation

NEPA Finding

The No Build Alternative would not result in adverse effects to climate change.

CEQA Determination

The No Build Alternative would not result in significant climate change impacts.

4.8.3.2 TSM Alternative

4.8.3.2.1 Impact Analysis

Construction Impacts

The TSM Alternative assumes that neither LRT build alternative would be constructed. Although some bus stops may be constructed as part of this alternative, construction emissions from the TSM Alternative would be minimal. For this analysis, it was assumed that no construction emissions would occur under the TSM Alternative.

Operational Impacts

The TSM Alternative represents a scenario where reductions in regional traffic would be caused by improvements in the bus system, rather than by extension of the light rail transit (LRT) system.

The TSM Alternative would result in a decrease in total direct GHG emissions, compared with the No Build Alternative, of 65,410 metric tons CO_2e per year. The TSM Alternative is predicted to result in less reduction in VMT than the LRT alternatives.

4.8.3.2.2 Mitigation Measures

Since the TSM Alternative would not result in significant climate change impacts, no mitigation measures are required.

4.8.3.2.3 Impacts Remaining After Mitigation

NEPA Finding

Although some bus stops may be constructed as part of this alternative, construction emissions from the TSM Alternative would be minimal. For this analysis, it was assumed that no construction emissions would occur under the TSM Alternative and the effects would not be adverse.

The TSM Alternative would result in a decrease in GHG emissions when compared with the No Build Alternative and an increase in GHG emissions when compared with existing conditions (2010) because of regional growth. These emission levels are well under CEQ's draft threshold for quantitative analysis (25,000 metric tons CO_2e per year) and GHG emissions effects would not be adverse under NEPA.

CEQA Determination

Although some bus stops may be constructed as part of this alternative, construction emissions from the TSM Alternative would be minimal. For this analysis, it was assumed that no construction emissions would occur under the TSM Alternative and impacts would be less than significant.

The TSM Alternative would result in a decrease in total direct GHG emissions compared with the adjusted environmental baseline (No Build Alternative). The project is predicted to have long-term beneficial climate change impacts when considered with other transit improvement projects that are included in the Regional Transportation Plan. A cumulative decrease in emissions is expected due to changes in transportation modes when other projects are built out.

The state's Climate Change Scoping Plan identifies regional transportation-related GHG emission reduction targets for passenger vehicles, consistent with the requirements of SB 375.[1]

The targets intend to integrate land-use development and the regional transportation network in a way that would reduce VMT and meet housing needs. Therefore, the TSM Alternative would be consistent with SB 375 because it would establish a part of the regional transportation network that would serve to remove vehicles from the roadways.

4.8.3.3 SR 60 LRT Alternative

4.8.3.3.1 Impact Analysis

Construction Impacts

The construction of the SR 60 LRT Alternative would result in GHG emissions from diesel-fueled construction equipment, haul trucks, and construction worker commute vehicles. Four aerial stations with parking structures would be constructed along with the Mission Junction maintenance yard. **Table 4.8-4** summarizes CO_2e emissions resulting from the construction of the SR 60 LRT Alternative.

Operational Impacts

Total operational GHG emissions from regional highway traffic, bus operation, and light rail operation (i.e., LRVs, stations, and maintenance yard) are summarized in **Table 4.8-5**. The SR 60 LRT Alternative includes a robust bus interface plan that would increase the GHG emissions above the No Build Alternative. In other words, while this alternative would reduce highway traffic in comparison with the No Build Alternative, new bus routes would be added to create north-south connections to the light rail. These new routes would increase bus traffic compared with the No Build Alternative. Furthermore, operation of the LRVs would use more electricity than the No Build Alternative. The combination of the robust bus interface plan and the additional electricity needed for LRV operations leads to the perception that the SR 60 LRT Alternative would perform worse than the TSM Alternative, although passenger vehicle emissions are lower in this alternative than in the TSM Alternative. The total increased emissions from the rail vehicles, rail facilities, and additional bus service would counteract the decreased emissions from passenger vehicles. The Eastside Transit Corridor Phase 2 Project is a component of the 2012-2035 *Regional Transportation Plan/ Sustainable Communities Strategy* (RTP/SCS) and it meets California's goal to increase mass transit under the AB 32 Scoping Plan.

[1] SB 375 requires CARB to set regional targets for the purpose of reducing GHG emissions from passenger vehicles for 2020 and 2035. It is intended that regions will meet these emission reduction requirements through integrated land use, housing, and transportation plans. CARB finalized per capita GHG emission reduction targets (relative to 2005) of eight percent by 2020 and 13 percent by 2035 for SCAG.

Table 4.8-4. SR 60 LRT Alternative: Annual Construction GHG Emissions (2027-2030)

Phase	Emissions of CO_2e (metric tons per year)				
	2027	2028	2029	2030	Project
Aerial Guideway Construction[1]	112	1,524	1,313	1,272	4,221
Maintenance Yard Construction[1]	N/A	N/A	1,871	2,077	3,947
Parking Structure Construction[1]	N/A	N/A	N/A	364	364
Total	112	1,524	3,184	3,713	8,532

Source: CDM Smith 2013
Note:
[1] Emissions from off-road diesel equipment, construction worker commuting, and haul/vendor trucks were included in totals.
Key:
CO_2e = carbon dioxide equivalent
N/A = not applicable

In addition, as required by SB 375, implementation of the 2012-2035 RTP/SCS would reduce the per capita CO_2 emissions from light duty trucks and automobiles when compared to business as usual. The Program Environmental Impact Report for the 2012-2035 RTP/SCS states that CO_2 emission reductions would meet CARB's "eight percent less than 2005 in 2020" target and would achieve an even greater emissions reduction in 2035 compared to the "13 percent less than 2005 in 2035" target. In 2035 the region would actually achieve emission reductions of 16 percent per capita.

Table 4.8-5. SR 60 LRT Alternative: Summary of Total Operational GHG Emissions as Built in 2035

Source	Emissions (metric tons CO_2e per year)[1]			
	CO_2	CH_4	N_2O	Total[4]
Regional Traffic[2]	79,747,515	57,170	321,399	80,126,084
Transit Buses	23,419	10	322	23,752
Light Rail[3]	7,442	3	14	7,460
Total Emissions[4]	79,778,377	57,184	321,734	80,157,295
Increment based on Existing Conditions (2010)[5]	27,180,701	(14,425)	(178,161)	26,988,115
Increment based on No Build Alternative (2035)[5]	(61,564)	(48)	(198)	(61,810)

Source: CDM Smith 2013.
Notes:
[1] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
[2] Regional traffic emissions are 76,249 metric tons CO_2e per year less than the No Build Alternative, which reflects a mode shift from single-occupancy vehicles to LRT.
[3] Light rail emissions include operation of the train (electricity), stations, and maintenance yard.
[4] Totals may vary due to rounding.
[5] Emission reductions (beneficial impacts) are shown in parentheses.

The SR 60 North Side Design Variation would not change the operating conditions of the SR 60 LRT Alternative. As a result, the operational GHG impacts would be the same for the design variation.

An evaluation was also completed to compare the SR 60 LRT Alternative plus existing conditions with existing conditions, as upheld by the Sunnyvale CEQA decision. **Table 4.8-6** compares emissions for the SR 60 LRT Alternative (as if it had been built in 2010) with existing conditions in 2010.

4.8.3.3.2 Mitigation Measures

No mitigation measures are required for the SR 60 LRT Alternative because it would be consistent with regional and statewide plans to reduce GHG emissions from passenger vehicles.

4.8.3.3.3 Impacts Remaining After Mitigation

NEPA Finding

Unmitigated construction emissions for the SR 60 LRT Alternative would not be adverse under NEPA and therefore do not need to be mitigated.

The SR 60 LRT Alternative would result in a decrease in the total of direct and indirect operational GHG emissions of 61,810 metric tons CO_2e per year by comparison with the No Build Alternative. These emission levels are well under CEQ's draft threshold for quantitative analysis (25,000 metric tons CO_2e per year) and GHG emissions effects would not be adverse under NEPA.

CEQA Determination

Unmitigated construction emissions for the SR 60 LRT Alternative would not be significant under CEQA and therefore do not need to be mitigated.

As described for NEPA, the SR 60 LRT Alternative would result in a decrease in total direct and indirect GHG emissions when compared with the adjusted environmental baseline (No Build Alternative). With the amortized construction emissions (i.e., total construction emissions divided by the lifetime of the project, assumed to be 30 years) added to the operational emissions, the expected decrease in emissions would be 61,525 metric tons CO_2e per year. The SR 60 LRT Alternative would be consistent with the requirements of CARB's Scoping Plan and SB 375 because it would meet California's goal to increase mass transit. Therefore, GHG emissions impacts under the SR 60 LRT Alternative would be less than significant under CEQA.

Comparison of Alternative Against Existing Conditions

The SR 60 LRT Alternative would result in a beneficial reduction in incremental emissions (amortized construction and operational emissions) of 17,646,684 metric tons CO_2e per year compared with existing conditions (2010). Since incremental emissions would be less than those for existing conditions, no CEQA impacts unique to the existing conditions analysis would occur. Appendix GG, Existing Plus Project Conditions, contains additional information on how this analysis was completed.

4.8.3.4 Washington Boulevard LRT Alternative

4.8.3.4.1 Impact Analysis

Construction Impacts

Construction of the Washington Boulevard LRT Alternative would result in GHG emissions from diesel-fueled construction equipment, haul trucks, and construction worker commute vehicles. Three at-grade and three aerial guideway stations would be constructed, with parking structures at five of those stations. Three maintenance yard options are proposed for the

Table 4.8-6. SR 60 LRT Alternative: Summary of Total Operational GHG Emissions as Built in 2010

Source	Emissions (metric tons CO_2e per year)[1]			
	CO_2	CH_4	N_2O	Total[4]
Regional Traffic[2]	35,290,580	26,540	173,880	35,491,000
Transit Buses	23,419	10	322	23,752
Light Rail[3]	7,442	3	14	7,460
Total Emissions[4]	35,321,442	26,554	174,216	35,522,211
Increment based on Existing Conditions (2010)[5]	(17,276,235)	(45,055)	(325,679)	(17,646,969)

Source: CDM Smith 2013.

Notes:
[1] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
[2] Regional traffic emissions are 18,673 metric tons CO_2e per year less than the No Build Alternative, which reflects a mode shift from single-occupancy vehicles to LRT.
[3] Light rail emissions include operation of the train (electricity), stations, and maintenance yard.
[4] Totals may vary due to rounding.
[5] Emission reductions (beneficial impacts) are shown in parentheses.
Key:
CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide
CO_2e = carbon dioxide equivalent

Washington Boulevard LRT Alternative: Santa Fe Springs (9 acres), Commerce (12 acres), and Mission Junction (11 acres). Construction-related emissions are proportional to the acreage of each construction site; therefore, the maintenance yard at Santa Fe Springs would have the least construction impact (396 metric tons CO_2e) while the maintenance yards at Commerce and Mission Junction would have the same impact (398 metric tons CO_2e) because of their similar size. **Tables 4.8-7** through **4.8-9** summarize construction-related emissions.

Operational Impacts

Total operational emissions from regional highway traffic, bus operation, and light rail operation (i.e., LRVs, stations, and maintenance yard) are summarized in **Table 4.8-10**. The Washington Boulevard LRT Alternative includes a robust bus interface plan that would increase GHG emissions above the No Build Alternative. In other words, while this alternative would reduce highway traffic compared with the No Build Alternative, new bus routes would be added to create north-south connections to the light rail. These new routes would increase bus traffic compared with the No Build Alternative. Furthermore, operation of the LRVs would use more electricity than the No Build Alternative. The combination of the robust bus interface plan and the additional electricity required for LRV operations leads to the perception that the performance of the Washington Boulevard LRT Alternative would be worse than the TSM Alternative, although passenger vehicle emissions are lower in this alternative than in the TSM Alternative. The combination of increased emissions due to the rail vehicles, rail facilities, and additional bus service would counteract the decreased emissions from passenger vehicles. The Eastside Transit Corridor Phase 2 Project is a component of the 2012-2035 RTP/SCS and meets California's goal to increase mass transit under the AB 32 Scoping Plan.

Table 4.8-7. Washington Boulevard LRT Alternative with the Santa Fe Springs Yard Option: Annual Construction GHG Emissions (2028-2031)

Phase	Emissions of CO_2e (metric tons per year) [1]				
	2028	2029	2030	2031	Project
Aerial Guideway Construction[2]	1,944	2,686	2,697	1,114	8,440
Maintenance Yard Construction[2]	--	--	1,046	2,089	3,135
Parking Structure Construction[2]	--	--	--	314	314
Total	1,944	2,686	3,743	3,517	11,890

Source: CDM Smith 2013
Note:
[1] Construction would start in 2027 for both the SR 60 and Washington Boulevard LRT Alternatives. However, the construction phase predicted to occur in 2027 for the Washington Boulevard LRT Alternative would have negligible GHG emissions and was not quantified. For this analysis, the construction duration was estimated to be four years for the SR 60 Alternative (2027-2030) and five years for the Washington Boulevard LRT Alternative (2027-2031). Construction duration of five years instead of six years was assumed for the Washington Boulevard LRT Alternative in order to analyze a worst case scenario for air quality emissions under this alternative.
[2] Emissions from off-road diesel equipment, construction worker commuting, and haul/vendor trucks were included in totals.
Key:
CO_2e = carbon dioxide equivalent

Table 4.8-8. Washington Boulevard LRT Alternative with the Commerce Yard Option: Annual Construction GHG Emissions (2028-2031)

Phase	Emissions of CO_2e (metric tons per year)[1]				
	2028	2029	2030	2031	Project
Aerial Guideway Construction[2]	1,944	2,686	2,697	1,114	8,440
Maintenance Yard Construction[2]	--	--	1,046	2,089	3,135
Parking Structure Construction[2]	--	--	--	378	378
Total	1,944	2,686	3,743	3,581	11,954

Source: CDM Smith 2013
Note:
[1] Construction would start in 2027 for both the SR 60 and Washington Boulevard LRT Alternatives. However, the construction phase predicted to occur in 2027 for the Washington Boulevard LRT Alternative would have negligible GHG emissions and was not quantified. For this analysis, the construction duration was estimated to be four years for the SR 60 Alternative (2027-2030) and five years for the Washington Boulevard LRT Alternative (2027-2031). Construction duration of five years instead of six years was assumed for the Washington Boulevard LRT Alternative in order to analyze a worst case scenario for air quality emissions under this alternative.
[2] Emissions from off-road diesel equipment, construction worker commuting, and haul/vendor trucks were included in totals.
Key:
CO_2e = carbon dioxide equivalent

Table 4.8-9. Washington Boulevard LRT Alternative with the Mission Junction Yard Option: Annual Construction GHG Emissions (2028-2031)

Phase	Emissions of CO2e (metric tons per year)1				
	2028	2029	2030	2031	Project
Aerial Guideway Construction[2]	1,944	2,686	2,697	1,114	8,440
Maintenance Yard Construction[2]	--	--	1,046	2,089	3,135
Parking Structure Construction[2]	--	--	--	364	364
Total	1,944	2,686	3,743	3,567	11,939

Source: CDM Smith 2013
Note:
[1] Construction would start in 2027 for both the SR 60 and Washington Boulevard LRT Alternatives. However, the construction phase predicted to occur in 2027 for the Washington Boulevard LRT Alternative would have negligible GHG emissions and was not quantified. For this analysis, the construction duration was estimated to be four years for the SR 60 Alternative (2027-2030) and five years for the Washington Boulevard LRT Alternative (2027-2031). Construction duration of five years instead of six years was assumed for the Washington Boulevard LRT Alternative in order to analyze a worst case scenario for air quality emissions under this alternative.
[2] Emissions from off-road diesel equipment, construction worker commuting, and haul/vendor trucks were included in totals.
Key:
CO_2e = carbon dioxide equivalent

Table 4.8-10. Washington Boulevard LRT Alternative: Summary of Total Operational GHG Emissions as Built in 2035

Source	Emissions (metric tons CO_2e per year)[1]			
	CO_2	CH_4	N_2O	Total[4]
Regional Traffic[2]	79,747,363	57,170	321,398	80,125,931
Transit Buses	24,216	11	333	24,560
Light Rail[3]	9,647	5	18	9,670
Total Emissions[4]	79,781,227	57,185	321,749	80,160,161
Increment based on Existing Conditions[5]	27,183,550	(14,423)	(178,146)	26,990,981
Increment based on No Build Alternative[5]	(58,715)	(47)	(183)	(58,944)

Source: CDM Smith 2013.
Notes:
[1] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
[2] Regional traffic emissions are 76,402 metric tons CO_2e per year less than the No Build Alternative, which reflects a mode shift from single-occupancy vehicles to LRT.
[3] Light rail emissions include operation of the train (electricity), stations, and maintenance yard.
[4] Totals may vary due to rounding.
[5] Emission reductions (beneficial impacts) are shown in parentheses.
Key:
CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide

In addition, as required by SB 375, implementation of the 2012-2035 RTP/SCS would reduce per capita CO_2 emissions from light duty trucks and automobiles compared to business as usual. The Program Environmental Impact Report for the 2012-2035 RTP/SCS states that CO_2 emission reductions would meet CARB's "eight percent less than 2005 in 2020" target and would achieve an even greater emissions reduction in 2035 compared to the "13 percent less than 2005 in 2035" target. In 2035 the region would actually achieve emissions reductions of 16 percent per capita.

An evaluation was also completed to compare the Washington Boulevard LRT Alternative plus existing conditions with existing conditions, as upheld by the Sunnyvale CEQA decision. **Table 4.8-11** compares the emissions of the Washington Boulevard Alternative (as if it had been built in 2010) with existing conditions in 2010.

4.8.3.4.2 Mitigation Measures

No mitigation measures are required for the Washington Boulevard LRT Alternative because it would be consistent with regional and statewide plans to reduce GHG emissions from passenger vehicles.

4.8.3.4.3 Impacts Remaining After Mitigation

NEPA Finding

Unmitigated construction emissions for the Washington Boulevard LRT Alternative would not be adverse under NEPA and therefore do not need to be mitigated.

The total direct and indirect operational emissions of GHGs under the Washington Boulevard LRT Alternative would decrease by 59,723 metric tons CO_2e per year compared with the No Build Alternative. These emission levels are well under CEQ's draft threshold for quantitative analysis (25,000 metric tons CO_2e per year) and GHG emissions effects would not be adverse under NEPA.

CEQA Determination

Unmitigated construction emissions for the Washington Boulevard LRT Alternative would not be significant under CEQA and therefore do not need to be mitigated.

The Washington Boulevard LRT Alternative would result in a decrease in the total direct and indirect GHG emissions compared with the adjusted environmental baseline (No Build Alternative). Emissions from three possible maintenance yards (Santa Fe Springs, Commerce, and Mission Junction) were analyzed as part of this alternative, but only one of the three would actually be built. As a result, the GHG emissions (amortized construction and operational emissions) decrease would range from 58,545 metric tons CO_2e per year to 58,548 metric tons CO_2e per year. The Washington Boulevard LRT Alternative would be consistent with the requirements of CARB's Scoping Plan and SB 375 because it would meet California's goal of increasing mass transit; therefore, GHG emissions impacts under the Washington Boulevard LRT Alternative would be less than significant under CEQA.

Comparison of Alternative Against Existing Conditions

The Washington Boulevard LRT Alternative would result in a beneficial reduction in incremental emissions (amortized construction and operational emissions) of 17,640,323 to 17,640,325 metric tons CO_2e per year compared with existing conditions (2010). Since incremental emissions would be less than those for existing conditions, no CEQA impacts unique to the existing conditions analysis would occur. Appendix GG, Existing Plus Project Conditions, contains additional information on how this analysis was completed.

Table 4.8-11. Washington Boulevard LRT Alternative: Summary of Total Operational GHG Emissions as Built in 2010

Source	Emissions (metric tons CO2e per year)1			
	CO_2	CH_4	N_2O	Total[4]
Regional Traffic[2]	35,293,791	26,542	173,896	35,494,229
Transit Buses	24,216	11	333	24,560
Light Rail[3]	9,647	5	18	9,670
Total Emissions[4]	35,327,654	26,558	174,247	35,528,459
Increment based on Existing Conditions (2010)[5]	(17,270,023)	(45,051)	(325,648)	(17,640,721)

Source: CDM Smith 2013.
Notes:
[1] CO_2e emissions are weighted by the GWP for each non-CO_2 pollutant (i.e., CO_2e equals emissions of non-CO_2 pollutant x its GWP).
[2] Regional traffic emissions are 15,445 metric tons CO_2e per year less than the No Build Alternative, which reflects a mode shift from single-occupancy vehicles to LRT.
[3] Light rail emissions include operation of the train (electricity), stations, and maintenance yard.
[4] Totals may vary due to rounding.
[5] Emission reductions (beneficial impacts) are shown in parentheses.
Key:
CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide
CO_2e = carbon dioxide equivalent