

4.5. Revised Section 4.5 Climate Change

4.5.1. Checklist Question: VII

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change by the United Nations and World Meteorological Organization in 1988, has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), HFC-23 (fluoroform), HFC-134a (s,s,s,2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In the United States (U.S.), the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light duty trucks, other trucks, buses, and motorcycles make up the largest source (second to electricity generation) of GHG emitting sources. The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change. "Greenhouse Gas Mitigation" is a term for reducing GHG emissions in order to reduce or "mitigate" the impacts of climate change. "Adaptation," refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).¹

The four primary strategies for reducing GHG emissions from transportation sources are: (1) improving the transportation system and operational efficiencies, (2) reducing the growth of vehicle miles traveled (VMT), (3) transitioning to lower GHG emitting fuels, and (4) improving vehicle technologies. To be most effective, all four strategies should be pursued cooperatively. The following Regulatory Setting section outlines

¹ http://climatechange.transportation.org/ghg_mitigation/.

state and federal efforts to comprehensively reduce GHG emissions from transportation sources.

4.5.1.1. Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and pro-active approach to dealing with GHG emissions and climate change.

Assembly Bill 1493, Pavley. Vehicular Emissions: Greenhouse Gases, 2002:

Requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the United States Environmental Protection Agency (EPA) Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emission standards for motor vehicles beginning with model year 2009. California agencies will be working with Federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger cars model years 2017-2025.

Executive Order S-3-05 (signed on June 1, 2005, by former Governor Arnold Schwarzenegger): Goal is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by the 2020 and (3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, Núñez and Pavley: Sets the same overall GHG emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that ARB create a scoping plan (which includes market mechanisms) and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 (signed on October 18, 2006, by former Governor Arnold Schwarzenegger): Further directs state agencies to begin implementing AB 32, including the recommendations made by the California's Climate Action Team.

Executive Order S-01-07 (signed on January 18, 2007, by former Governor Schwarzenegger): Set forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California’s transportation fuels is to be reduced by at least 10 percent by year 2020.

Senate Bill 97 (Chapter 185, 2007): Senate Bill 97 required the Governor’s Office of Planning and Research (OPR) to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (Chapter 728, 2008) Sustainable Communities and Climate Protection: This bill requires the CARB to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization for each region must then develop a “Sustainable Communities Strategy” that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (Chapter 585, 2009) California Transportation Plan: This bill requires the state’s long-range transportation plan to meet the climate change goals set for California in AB 32.

Caltrans Director’s Policy 30 (DP-30) Climate Change (approved June 22, 2012): Intended to establish a Caltrans policy that will ensure coordinated efforts to incorporate climate change into Caltrans’ decisions and activities. This policy contributes to Caltrans’ stewardship goal to preserve and enhance California’s resources and assets.

Federal

Although climate change and GHG reduction is a concern at the federal level, currently there are no regulations or legislation that have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the EPA nor the FHWA has promulgated explicit guidance or methodology to conduct project-level GHG analysis. As stated on FHWA’s climate change website (<http://www.fhwa.dot.gov/hep/climate/index.htm>), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and

stewardship needs at the project level. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in the growth of vehicle hours travelled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the “National Clean Car Program” and Executive Order 13514 – Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 (October 5, 2009): This Executive Order is focused on reducing GHG gases internally in federal agency missions, programs, and operations, and also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

EPA’s authority to regulate GHG emissions stems from the United States Supreme Court decision in *Massachusetts v. EPA* (2007). The Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, EPA finalized an endangerment finding in December 2009. Based on scientific evidence, it found that six GHGs constitute a threat to public health and welfare. Therefore, it is the Court’s interpretation of the existing Clean Air Act and EPA’s assessment of the scientific evidence that form the basis for EPA’s regulatory actions. EPA, in conjunction with the National Highway Traffic Safety Administration (NHTSA), issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.¹

¹ <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>
(accessed November 25, 2013).

The EPA and NHTSA are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and save 1.8 billion barrels of oil over the lifetime of vehicles sold under the first phase of this national program (model years 2012-2016).

On August 28, 2012, EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model years 2017 through 2025 passenger vehicles. Over the lifetime of the model years 2017-2025 standards, this program is projected to save approximately four billion barrels of oil and reduce GHG emissions by an estimated two billion metric tons.

The complementary EPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses, and refuse and utility trucks). Together, these standards will reduce GHG emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish GHG emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model years 2014 to 2018 heavy-duty vehicles.

Thresholds of Significance

Neither the SCAQMD nor Caltrans have established significance thresholds for greenhouse gas emissions for transportation facilities. Therefore, based on the CEQA Guidelines, RCTC has determined that the MCP Build Alternatives and their design variations would result in significant effects related to greenhouse gas emissions if they:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or

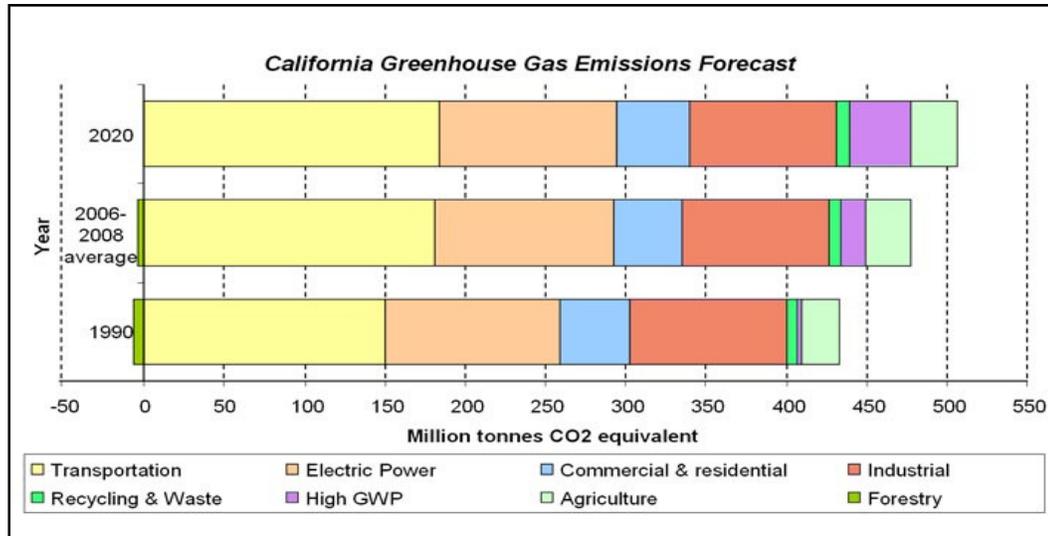
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

4.5.1.2. Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHG.¹ In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines Sections 15064(h)(1) and 15130. To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

The AB 32 Scoping Plan mandated by AB 32 contains the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California (forecast last updated October 28, 2010). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008. The California GHG emissions forecast is shown in Figure 4.1.

¹ This approach is supported by the AEP: Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).



Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>.

Figure 4.1 California Greenhouse Gas Forecast

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.¹

One of the main strategies in Caltrans’ Climate Action Program to reduce GHG emissions is to make California’s transportation system more efficient. The highest levels of carbon dioxide (CO₂) from mobile sources, such as automobiles, occur at stop-and-go speeds (0–25 mph) and speeds over 55 mph; the most severe emissions occur from 0–25 mph (see Figure 4.2).

¹ Caltrans Climate Action Program is located at the following web address:
http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf.

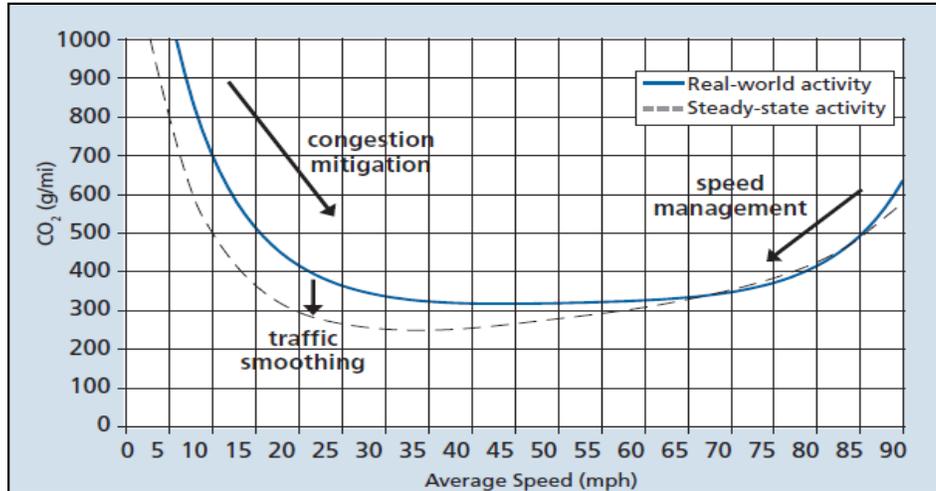


Figure 4.2 Possible Effect of Traffic Operation Strategies in Reducing On-Road CO₂ Emission¹

4.5.1.3. Long-term Operational Emissions

The Traffic Technical Study (VRPA, April 2011) calculated the daily VMT and daily vehicle hours traveled (VHT) for all of the vehicle trips within the MCP region. This traffic data, in conjunction with the EMFAC2007 emission model, was used to calculate the CO₂ emissions for the Existing, 2020, and 2040 regional conditions. As shown in Table 4.5.A, the existing plus MCP project alternatives would result in a 5 percent reduction in CO₂ emissions within the region when compared to the existing conditions. In 2020 and 2040, when compared to the 2020 and 2040 without project conditions, the MCP project alternatives would result in a small increase (less than 1 percent). This small increase in CO₂ emissions is due to the increased regional VMT associated with existing trips being diverted to the proposed facility.

¹ Traffic Congestion and Greenhouse Gases: Matthew Barth and Kanok Boriboonsomsin (TR News 268 May-June 2010) <http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf>.

Table 4.5.A Change in Regional CO₂ Emissions

Alternative	Daily CO₂ Emissions (lbs/day)	Increase from Existing (lbs/day)	Increase from No Build (lbs/day)	Percent Increase from No Build
Existing (2008)	57,051,980	-	-	-
Existing + Alt 4 Mod	54,185,822	-2,866,069	-2,866,069	-5%
Existing + Alt 5 Mod	54,045,450	-3,006,440	-3,006,440	-5%
Existing + Alt 9 Mod	54,091,127	-2,960,763	-2,960,763	-5%
2020 No Build	87,631,280	30,579,300	-	-
2020 Alt 4 Mod	87,885,919	30,833,939	254,639	0.29%
2020 Alt 5 Mod	87,853,255	30,801,275	221,975	0.25%
2020 Alt 9 Mod	87,906,784	30,854,804	275,504	0.31%
2040 No Build	125,539,130	68,487,150	-	-
2040 Alt 4 Mod	126,057,775	69,005,795	518,645	0.41%
2040 Alt 5 Mod	126,043,848	68,991,868	504,719	0.40%
2040 Alt 9 Mod	126,150,645	69,098,665	611,515	0.49%

Source: LSA Associates, Inc. 2012.
 Alt = Alternative
 CO₂ = carbon dioxide
 lbs/day = pounds per day
 Mod = Modified

4.5.1.4. Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays due to construction. The maximum amounts of construction-related emissions during a peak construction day for the MCP Build Alternatives are presented in Table 4.5.B. The emissions presented below are based on the best information available at the time of these calculations and assume that the schedule for all improvements is anticipated to take approximately 48 months, beginning in 2016 and ending in 2020. The construction emissions were estimated for the project using the Sacramento Metropolitan Air Quality Management District’s (SMAQMD’s) Road Construction Emissions Model, Version 7.1.4, a model approved for use within the South Coast Air Basin by the SCAQMD. The project schedule and disturbed area would be similar for all the Build Alternatives; therefore, the emissions listed in Table 4.5.B would apply to Alternatives 4 Modified, 5 Modified, and 9 Modified.

The construction emissions listed in Table 4.5.B include emissions generated by material deliveries, worker trips, soil import and export, water trucks, generators, pumps, signal boards, and off-road equipment such as graders, scrapers, and loaders.

Table 4.5.B Maximum Project Construction Greenhouse Gas Emissions

Project Phases	CO ₂ (lbs/day)
Grubbing/Land Clearing (lbs/day)	18,741.0
Grading/Excavation (lbs/day)	48,844.7
Drainage/Utilities/Sub-Grade (lbs/day)	19,564.1
Paving (lbs/day)	12,330.7
Maximum (lbs/day)	48,844.7
Total (metric tons/construction project)	15,344

Source: LSA Associates, Inc., January 2014.
 CO₂ = carbon dioxide
 lbs/day = pounds per day

The on-road emissions are based on 130 haul truck trips per day with a round trip distance of 30 miles and up to 75 employee trips per day with a round trip distance of 40 miles. All on-site construction equipment is operating for eight hours per day.

4.5.1.5. Total Emissions

Table 4.5.C lists the total increase in GHG emissions that would be generated by each Build Alternative between 2020 and 2040, the years for which traffic data is available and the project is expected to be operational. The annual emissions were calculated by multiplying the daily increase in CO₂ emissions by 365. As shown in Table 4.5.C, over a 20-year period (20 years is the minimum pavement design life per Topic 612 in the Caltrans Highway Design Manual, 2012), the Build Alternatives would add 1,263,293 to 1,542,003 metric tons of CO₂ to the project region, depending on the Build Alternative. When added to the 15,344 metric tons of CO₂ that would be generated during construction, it is estimated that the MCP project would generate up to 1,557,347 metric tons of CO₂ in the project area over the 20-year period.

Table 4.5.C Total Increase in Regional CO2 Emissions (Metric Tons) between 2020 and 2040

Alternative	Operational Emissions (On-road Vehicles)	Construction Emissions	Total Emissions	Percent of GHG Emissions Generated by On-Road Vehicles
Alt 4 Mod	1,344,285	15,344	1,359,629	98.9%
Alt 5 Mod	1,263,293	15,344	1,278,637	98.8%
Alt 9 Mod	1,542,003	15,344	1,557,347	99.0%

Source: LSA Associates, Inc. January 2014.
 Alt = Alternative
 CO₂ = carbon dioxide
 GHG = greenhouse gas
 Mod = Modified

By reducing unnecessary idling, maintaining construction equipment, using newer Tier 2 and Tier 3 off-road equipment, and using solar power or electricity from power poles, Measures AQ-2 and AQ-3, listed in Section 3.14.4 of the EIR/EIS, would reduce the GHG emissions generated by the on-site construction equipment. However, as shown in Table 4.5.C, 98 to 99 percent of the emissions of the Build Alternatives would be generated by operational emissions from on-road vehicles. Therefore, these mitigation measures would not measurably reduce the emissions listed in Table 4.5.C.

4.5.1.6. CEQA Conclusion

As stated in Section 4.5.1.1, neither the SCAQMD nor Caltrans have established significance thresholds for greenhouse gas emissions for transportation facilities. Therefore, RCTC has used the CEQA Guidelines to determine the significant effects of the MCP Build Alternatives and their design variations related to greenhouse gas emissions.

The existing conditions in 2008 plus MCP project alternatives would result in a 5 percent reduction in CO₂ emissions within the region when compared to the existing conditions. However, as discussed above, the MCP project would result in a small increase (less than 1 percent) in CO₂ emissions within the region in 2020 and 2040 when compared to the 2020 and 2040 without project conditions. As shown in Table 4.5.C, it is estimated that the MCP project would contribute up to 1,557,347 metric tons of CO₂ to the project area between 2020 and 2040. CEQA says that there is no “iron clad definition of significant effect” (State CEQA Guidelines Section 15064(b)), and so leaves it to a lead agency’s discretion to determine when GHG emissions are significant under CEQA (State CEQA Guidelines, Section 15064.4.) Therefore, in the absence of a state-established numerical threshold and in an abundance of caution, RCTC has concluded that the MCP Build Alternatives would generate GHG emissions that may have a significant impact on the environment.

Within its 2011 update to the 2008 AB 32 Scoping plan, ARB determined that under Business-as-usual (BAU) conditions that the State’s 2020 GHG emissions would be 507 million metric tons. According to Executive Order S-3-05, California is required to reduce its annual emissions to 1990 levels by 2020. ARB has established that the level of annual GHG emissions in 1990 for California was 427 million metric tons of “CO₂ equivalence” (CO₂e). To meet the 427 million metric ton goal the State would

need to reduce the 2020 emissions by 80 million metric tons or approximately 15.8 percent from BAU. Based on the results shown in Table 4.5.A, in 2020 the proposed project would add up to 45,600 metric tons of CO₂ to the project area. By adding emissions to the project area that would not be generated under the no-build conditions, the proposed build alternatives could delay the State's goal of reducing the GHG emissions to 1990 levels by 2020. Therefore, the proposed project would conflict with the emission reduction goals in AB 32.

The majority (up to 99 percent as shown in Table 4.5.C) of these emissions is generated by on-road vehicles. Because RCTC does not have the legal authority to control on-road vehicle emissions, there are no measures that can be implemented by RCTC to reduce that impact to less than significant under CEQA. In addition, RCTC lacks the land use authority to construct off-site GHG reducing facilities, such as solar or wind farms, capable of offsetting some or all of the project's GHG emissions. Therefore, the MCP Build Alternatives would result in a significant unavoidable adverse impact due to generation of GHG emissions.

Greenhouse Gas Reduction Strategies

Assembly Bill 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement the Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Former Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a \$222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including \$100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain CO₂ reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as depicted in Figure 4.3: The Mobility Pyramid.



Figure 4.3 The Mobility Pyramid

RCTC is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. RCTC is working closely with local jurisdictions on planning activities; however, RCTC does not have local land use planning authority. RCTC is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; and by supporting legislative efforts to increase fuel economy. It is important to note, however, that the control of the fuel economy standards is held by EPA and ARB.

Table 4.5.D summarizes Caltrans and statewide efforts that it is implementing in order to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

1. Landscaping reduces surface warming, and through photosynthesis, decreases CO₂. Landscaping would be provided where necessary within the corridor to provide aesthetic treatment, replacement planting, or mitigation planting for the project. The landscape planting would help offset a portion of the estimated CO₂ emissions increase.

Table 4.5.D Climate Change/CO₂ Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5% limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	CalEPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Source: California Department of Transportation Standard Environmental Reference EIR/EIS Annotated Outline, page 138, August 2013.

ARB = California Air Resources Board
 BT&H = Business, Transportation and Housing Agency
 CalEPA = California Environmental Protection Agency
 CEC = California Energy Commission
 CO₂ = carbon dioxide
 GHG = greenhouse gases
 MMT = million metric tons
 MPOs = Metropolitan Planning Organizations

2. The project would incorporate the use of energy-efficient lighting, such as light-emitting diode (LED) traffic signals. LED bulbs—or balls, in the stoplight vernacular—cost \$60 to \$70 apiece but last 5 to 6 years, compared to the 1-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project’s CO₂ emissions.¹
3. According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction. In addition, the contractor must comply with Title 13, California CCR Section 2449(d)(3) that was adopted by the ARB on June 15, 2008. This regulation restricts idling of construction vehicles to no longer than 5 consecutive minutes.

Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.

4.5.1.7. Adaptation Strategies

“Adaptation strategies” refer to how RCTC and other transportation agencies can plan for the effects of climate change on the State’s transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat, increasing storm damage from flooding and erosion, and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanographic and Atmospheric Administration, released its interagency report October 14, 2010, outlining recommendations to President Obama for how federal agency policies and programs can better prepare the United States to respond to the impacts of

¹ *Knoxville Business Journal*, “LED Lights Pay for Themselves,” May 19, 2008, at <http://www.knoxnews.com/news/2008/may/19/led-traffic-lights-pay-themselves/>.

climate change. The Progress Report of the Interagency Climate Change Adaptation Task Force recommends that the federal government implement actions to expand and strengthen the nation's capacity to better understand, prepare for, and respond to climate change.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This Executive Order set in motion several agencies and actions to address the concern of sea level rise.

The California Natural Resources Agency was directed to coordinate with local, regional, state, and federal public and private entities to develop the California Climate Adaptation Strategy (December 2009),¹ which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to Executive Order S-13-08 that specifically asked the California Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continue to be developed and collected, the State's adaptation strategy will be updated to reflect current findings.

¹ <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>.

The California Natural Resources Agency was also directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010¹ to advise how California should plan for future sea level rise. While estimates vary, sea level is expected to rise an additional 22 to 35 inches by the year 2100.² Although these projections are on a global scale, the rate of sea level rise along California's coast is relatively consistent with the worldwide average rate observed over the past century. Therefore, it is reasonable to assume that changes in worldwide sea level rise will also be experienced along California's coast.³ As the MCP project site is located approximately 1,500 ft above sea level and 35 mi from the coast, the area of the project would not be affected by an approximately 39-inch rise in sea level. Therefore, the potential effects of climate change on the project would not be significant.

¹ The Sea Level Rise Assessment report is currently due to be completed in 2012 and will include information for Oregon and Washington, as well as California.

² California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California*. CEC-500-2006-077. July.

³ California, State of. Department of Water Resources, 2006. *Progress on Incorporating Climate Change into Management of California's Water Resources*. July.

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